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This report is financed by the European Union through the European Commission and is presented by Consortium SAFEGE, Belgium for the Ministry of Agriculture and Animal Resources (MINAGRI) and other stakeholders related to agro-environmental issues in Rwanda and the European Commission. It does not necessarily reflect the opinion of MINAGRI, other National Institutions or the European Commission.

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Rwanda Natural Resources Authority;

Rwanda Bureau of Standards; and

National University of Rwanda.

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Acronyms and abbreviations

ACP	Africa Caribbean and Pacific
AF	Action Fiche
AfDB	African Development Bank
AFSIS	Africa Soil Information Service
AGRA	Alliance for Green Revolution in Africa
AI	Artificial Insemination
AJRS	Agriculture Joint Sector Review
ASWG	Agriculture Sector Working Group
BCC	Budget Call Circular
bn	Billion
BOQ	Bill of Quantities
BTC	Belgian Technical Cooperation
CAADP	Comprehensive Africa Agriculture Development Programme
CBD	Convention on Biological Diversity
CBPP	Contagious Bovine Pleuropneumonia
CCIOU	Climate Change and International Obligations Unit
CDM	Clean Development Mechanism
CEMP	Contractor's Environmental Management Plan
CICA	Agricultural Information and Communication Centre
CIP	Crop Intensification Programme
CPAF	Common Performance Assessment Framework
CRS	Catholic Relief Service
CSO	Civil Society Organisation
DDP	District Development Plan
DFID	Department for International Development (UK)
DFS	District Forestry Service
DMU	Disaster Management Unit
DNA	Designated National Authority
DSU	District Support Unit
EC	European Commission
EDPRS	Economic Development and Poverty Reduction Strategy
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ENR	Environment and Natural Resources
ENRSSP	Environment and Natural Resources Sector Strategic Plan

ENSO	El Niño Southern Oscillation
EU	European Union
EWSA	Energy Water and Sanitation Authority
EWS	Early Warning System
FAO	Food and Agriculture Organisation
FEWS	Famine Early Warning System
FFS	Farmer Field Schools
FMD	Foot and Mouth Disease
FONERWA	National Climate and Environment Fund of Rwanda
FTU	Formazin Turbidity Unit
FY	Fiscal Year
GAA	German Agro Action
GAP	Good Agricultural Practice
GCM	Global Circulation Models
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographical Information System
GoR	Government of Rwanda
gr.	Grams
GWLM	Gishwati Water and Land Management project
ha	Hectares
HACCP	Hazard Analysis and Critical Control Points
HH	Households
HIMO	Haute Intensité de Main-d'Oeuvre
HQ	Headquarters
HR	Human Resources
ICM	Integrated Crop Management
ICRAF	World Agroforestry Centre
ICT	Information and Communication Technologies
IDP	Integrated Development Programme
IFAD	International Fund for Agricultural Development
IFDC	International Center for Soil Fertility and Agricultural Development
IMBARAGA	Rwanda Farmers Federation
IMSC	Inter-Ministerial Steering Committee
INGABO	Rwandan Union of Agriculturalists and Animal Breeders
IOO	Implementation and Operations Order
IPM	Integrated Pest Management
IPPC	International Plant Protection Council

ISAE	Higher Institute of Agriculture and Animal Husbandry
ISAR	Rwanda Agricultural Research Institute
ISO	International Organisation for Standardisation
IWRM	Integrated Water Resources Management
JAP	Joint Action Plan
JDC	Joint Development Committee
JICA	Japan International Cooperation Agency
JSR	Joint Sector Review
K	Potassium
kcal	Kilocalories
kg	Kilogrammes
KEPHIS	Kenya Plant Health Inspectorate Service
KWAMP	Kirehe Community-based Watershed Management Project
LBM	Labour-based Methods
LWH	Land Husbandry Water Harvesting and Hillside Irrigation project
M€	Million Euros
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MIFOTRA	Ministry of Public Services and Labour
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
MINICOM	Ministry of Trade and Industry
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Natural Resources
MIS	Management Information System
Mm^3	Million cubic meters
MOH	Ministry of Health
MOU	Memorandum of Understanding
MRL	Maximum Residue Limits
MT	Metric Tonnes
MTEF	Medium Term Expenditure Framework
MTR	Mid Term Review
MW	Megawatts
N	Nitrogen
NAEB	National Agriculture Export Board
NAPA	National Adaptation Programme of Action to Climate Change
NFS	National Fertiliser Policy

NISR	National Institute of Statistics of Rwanda
NPK	Nitrogen, Phosphorous and Potassium
NR	Natural Resources
NSCCLCD	National Strategy for Climate Change and Low Carbon Development
NUR	National University of Rwanda
OECD	Organisation for Economic Cooperation and Development
OECD DAC	OECD Development Assistance Committee
OIE	World Animal Health Organisation
P	Phosphorous
P&D	Pest and Disease
p.a.	per annum
PADAB	Bugesera Agricultural Development Support Project
PAF	Performance Assessment Framework
PAGOR	Support for Local Governance in Rural Areas
PAIGELAC	Inland Lakes Integrated Management and Support Project
PAIRB	Bugesera Natural Region Rural Infrastructure Project
PAPSTA	Support Project for the Strategic Plan for the Transformation of Agriculture
PC	Performance Contract
PCR	Polymerase Chain Reaction
PDCRE	Smallholder Cash and Export Crops Development Project
PDRCIU	Umutara Community Resource and Infrastructure Development Project
PEI	Poverty-Environment Initiative
PES	Payment for Environmental Services
PHSCS	Post-Harvest Staple Crop Strategy
PM	Prime Minister
POP	Persistent Organic Pollutants
PPP	Public-Private Partnership
PRA	Pest Risk Analysis
PSC	Programme Steering Committee
R&D	Research and Development
RAB	Rwanda Agriculture Board
RALGA	Rwanda Association of Local Government Authorities
RARDA	Rwanda Animal Resources Development Authority
RBS	Rwanda Bureau of Standards
RDB	Rwanda Development Board
REIN	Rwanda Environmental Information Network
REMA	Rwanda Environmental Management Authority
RFR	Rural Feeder Roads

RMS	Rwanda Meteorological Service
RNRA	Rwanda Natural Resources Authority
RSSP	Rural Sector Support Project
RTDA	Rwanda Transport Development Agency
RWF	Rwanda Franc
SAKSS	Strategic Analysis and Knowledge Support
SBS	Sector Budget Support
sec	Seconds
SEA	Strategic Environmental Assessment
SIDA	Swedish International Development Agency
SME	Small and Medium Enterprise
SOTIRU	Societé des Travaux Industrielles du Rwanda
SP	Sub-Programme
SPS	Sanitary and Phytosanitary
SPSP	Sector Policy Support Programme
SPTA	Strategic Programme for the Transformation of Agriculture
SWAp	Sector-wide approach
SWG	Sector Working Group
SWOT	Strengths, Weaknesses, Opportunities and Threats
t	Tonnes
TA	Technical Assistance
TAPs	Technical and Administrative Provisions
TB	Tuberculosis
TDS	Total Dissolved Solids
TIG	Works of General Interest
ToT	Training of Trainers
TSS	Total Suspended Solids
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WB	World Bank
WHO	World Health Organisation
WRM	Water Resources Management
WTO-MSU	World Trade Organisation – Michigan State University
WUA	Water Users Association

yr	Year

0 Executive Summary

This is the first Strategic Environmental Assessment (SEA) of the Agriculture Sector in Rwanda and the product of a mission of 9.5 weeks up to 22/12/2011 by a team of three experts from SAFEGE, Belgium under a contract funded by the European Union (EU) and technically guided by the Ministry of Agriculture and Animal Resources (MINAGRI). The focus of work has been issue oriented and at the strategic level, considering EU 2009 Guidelines for Integration of Environment and Climate Change in Development Cooperation[1].

Nine key issues were identified for action. In the earlier period of study they were viewed mainly from the perspective of external effect of agriculture upon environment; by the end of the study they were being treated as to how agriculture and its practices could optimise environmental management and resource use, especially within the farm. Section A of the report provides the general context and description of the methodology, Section B analyses the key issues and Section C offers the recommendations to the Government of Rwanda and the European Commission.

The overall objective of this SEA is to ensure that environmental concerns are appropriately integrated in all sector (agriculture) and sub-sector (rural feeder roads) decision-making, implementation and monitoring processes. Findings of the SEA may influence policy development in the agriculture sector and the rural feeder roads sub-sector.

Rwanda's economy is heavily dependent on the agriculture sector, and is identified as one of the main motors for growth under Vision 2020 and the Economic Development and Poverty Reduction Strategy (EDPRS). The development of the sector is primarily guided by Rwanda's Strategic Programme for the Transformation of Agriculture II (SPTA2), complemented by other strategies, such as the National Post-Harvest Staple Crop Strategy (PHSCS). The European Union (EU) is providing assistance for implementing SPTA2 through Sector Budget Support (SBS), which will shortly be expanded.

The SEA consisted of two key phases: a scoping study and an SEA study. During scoping a preliminary identification of the key environmental concerns in the agriculture sector was made, taking into account both the effects of degraded natural resources in the sector's performance as well as the existing potential impacts on the environment associated to actions in the agriculture sector. The preliminarily identified key issues were discussed and validated in a stakeholders' workshop. During the SEA Study phase all key issues were assessed in detail and options identified to address them. Field visits were made in close coordination with MINAGRI, in order to verify issues at a local level and engage in local level stakeholder consultations.

Rwanda has a comprehensive policy and planning framework at national and sectorial level, where the environmental dimension is integrated, and which serve as a solid reference for further programming. The corpus of policy and planning documents are largely consistent, but there are some aspects of harmonisation that deserve attention with regards to the consistency of environmental objectives; the most relevant aspects of harmonisation are further explored in this SEA.

Rwanda has in place a solid set of institutions dealing with the environmental aspects of the agriculture sector, including arrangements for inter-sectoral and inter-institutional coordination. Issues that deserve attention are mainly related to the strengthening of capacities and the enhancement of coordination, as no aspects of major importance are present (as could be, e.g. important gaps in environmental governance, or important duplication of functions).

The environmental regulatory framework remains weak in Rwanda, although it is subject of attention and advances are gradually being made. Especially challenging are the effectiveness of the EIA regulatory system (associated mainly to enforcement capacities) and the control and management of agrochemical

[1] See http://www.environment-integration.eu/

products, and which are aspects subject of more detailed attention in this SEA report. Also of importance in the short-term is the completion of the regulatory framework for the management of water resources (work in progress). The generation of adequate baselines (e.g. water quality and hydrological balance, effluent discharges) remains a challenge that needs to be solved in order to ensure adequate monitoring and enforcement.

The key issues to be addressed fall into Technical (T) and Systemic (S) categories. Technical issues relate to specific technical aspects of the agriculture sector, whereas the systemic issues relate to aspects that cut across several technical dimensions and institutions. Technical Key Issues are: (1) soil and water conservation; (2) soil acidity and nutrient management; (3) crop and variety selection; (4) pest and disease management; and (5) rural feeder roads. Systemic Key Issues are: (1) monitoring & evaluation; (2) climate variability and climate change; (3) Environmental Impact Assessment system; and (4) local capacities.

Each issue has been analysed and reported upon with, *inter alia*, coverage of the baseline and current impacts, trends, 'SWOT' analysis examining capacities, mitigation and optimisation opportunities, synthesis to determine objectives, required results, actions and inputs; and recommended output/impact monitoring 'state' indicators for a three year initial *Performance Review* period to December 2014. For every issue several Results are recommended. They are relevant to the interest of Government of Rwanda (GoR) and the EU alike.

The table below provides an overview of the key issues, indicating the rationale for their selection as key issues and a synthesis of the assessment conclusions.

Rationale	Conclusions
Technical Issue 1: soil and water conservation	
• Soil erosion is closely associated to low agricultural productivity • Soil erosion control can only be addressed in terms of effectiveness in wider context of 'soil and water conservation' • Agro-forestry has important potential in water and soil retention • Water flows need to be guaranteed to secure provision of services (e.g. agriculture, energy, ecosystems, sanitation)	• Policy needs to change focus on integrated soil & water conservation, implying more attention to agro-forestry • Principles of soil and water conservation have to permeate all related activities, including the Crop Intensification Programme (CIP) • Efficiency and effectiveness considerations call for inclusion of measures besides radical terraces • Associated indicators require attention, including on soil erosion control, agroforestry and water use efficiency in irrigation
Technical Issue 2: soil acidity and nutrient management	
• Soil acidity and nutrient management is necessary foundation for crop production and frequently the most sensitive limiting factor in yield optimisation • SPTA2 promoted and subsidises fertilisers • Insufficient attention has been afforded at policy level to correcting soil acidity • Fertilisers are a potential source of water pollution	• The dramatic increase in use of inorganic fertilisers has to be accompanied by rationalisation in its use, to minimise environmental risks, taking into account soil nutrient needs • Soil acidity correction deserves further attention, based on site-specific needs
Technical Issue 3: crop and variety selection	
• Crop and variety selection is important in terms of food security, adaptation to climate variability and change and agro-biodiversity protection • A key element of the CIP is determination of priority crops and varieties per area, under coordinated single-cropping. Agricultural inputs are conditioned to planting selected target crops	• Crop and variety selection, as currently arranged, accentuate vulnerability to climate variability and climate change. Flexibility will need to be integrated, building farmers' capacities to make informed choices on crop and variety selection • Weather-related crop failure insurance should be expanded in the context of the CIP, as a necessary

• Crop selection and associated husbandry, including soil conservation, nutrient management and pest risk analysis and mitigation measures, are necessary foundations for optimised production	climate change adaptation measure
Technical Issue 4: pest and disease management	
• SPTA2 promotes the increased use of pesticides, and also promotes (albeit with less emphasis) Integrated Pest Management (IPM) • Use of IPM is emphasised in the context of the National Strategy for Climate Change and Low Carbon Development • Use of pesticides is associated to increased risk of water pollution and health risks	• The NSCCLCD requires mainstreaming of IPM • The FFS programme of RAB is potentially very valuable to secure training on IPM, including rational use of pesticides • The new Law on Agrochemicals is addressing aspects of pesticides management • IPM and Pest Risk Analysis needs to be developed, through the RBS
Technical Issue 5: rural feeder roads	
• Rural feeder roads are associated with environmental impacts, especially in absence of appropriate standards for design, construction and maintenance • RFR are associated with other key issues, as roads are necessary for provision of fertilisers and limestone, as well as efficiency of extensionists	• Region-specific climate-proofed feeder roads standards and specifications need to be adopted, in conformity with good environmental practice • Human resources at sector level have to be strengthened to avert dilution of agro-environmental Human Resources and improve dedicated absorption capacity for donor support to RFR
Systemic Issue 1: monitoring and evaluation	
• Various M&E frameworks are in place dealing with agro-environmental aspects, including: Vision 2020, EDPRS, SPTA2, ENRSSP, ASWG, ENR SWG and Imihigo • Indicators from different frameworks are not always consistent, nor all key indicators are routinely being measured • Reporting frameworks are also inconsistent and access to monitoring data not easily accessible	• Shortcomings of the M&E system centre around: access to monitoring data by institutions; reporting mechanisms to ensure broad access to results; capacities for monitoring at the (especially) local level; absence of proper M&E system for SPTA2, including monitoring and reporting mechanisms; and incomplete harmonisation of indicators. • Solutions are needed of a technological, strategic planning; capacity building and inter-institutional coordination nature.
Systemic Issue 2: climate variability and climate change	
• Effects of climate change in Rwanda are not well understood, but predictions indicate increase in rainfall and temperatures • The agriculture sector is highly vulnerable to climate variability and climate change • Rwanda currently has an adaptation gap to climate variability	• Challenges of climate variability and climate change are on the policy agenda • Some aspects are integral to some of the technical issues, including: optimal use of fertilisers, climate proofing of roads, integration of climate change considerations into CIP crop and variety selection • SPTA3 needs to mainstream climate change and build-up opportunities for adaptation
Systemic Issue 3: Environmental Impact Assessment system	
• EIA is key tool to minimise environmental impacts of projects, where Environmental Management Plans (EMPs) play an important role • Implementation of EMPs is currently deficient, and REMA enforcement capacities weak	• Effectiveness of the EIA system needs to be enhanced to ensure mitigation measures are effectively implemented and environmental monitoring effectively carried out and reported • There are opportunities available within the existing regulatory framework to enhance REMA's

	enforcement capacities
Systemic Issue 4: local capacities	
• Decentralisation is a key focus of Rwanda's policy for governance • The onus of agricultural policy implementation is at the local level, where, nevertheless, capacities remain low	• Adequate capacities for planning, coordination and implementation at local level are critical to guarantee good performance in the agriculture and ENR sectors • Districts and Sectors face challenges in terms of capacities, ranging from mere numbers of staffing and levels of experience and academic training, to issues of ambiguous definition of responsibilities, motivational factors, ICT facilities, mobility, etc.

Recommendations distinguish between those addressed to MINAGRI for integration into SPTA3; those addressed to non-agriculture sector institutions; recommendations for enhancement of EDPRS 2; recommendations for the CPAF; and recommendations to the European Commission. These are shown below. An indication is given to categorise recommendations according to: (a) interventions that should be continued; (b) reinforced/increased; (c) modified; or (d) introduced for the first time. As well the give an indication of their priority (top-, high-, or medium-priority).

Recommendations to be addressed in SPTA3

Most of the opportunities to enhance the environmental performance of the agriculture sector should find a place within the scope of SPTA3. The recommendations synthesised here refer only to those aspects that should be reflected in the SPTA3 document; to a large extent they provide a response to changes in policy thinking that have been taking place amongst stakeholders in the sector, but had not yet found an opportunity to be expressed in the relevant strategic and policy documents. In other cases they emphasise policy aspects and activities that were already present in SPTA2, but which have not been given the degree of attention we now believe they deserve due to their potential to contribute significantly to enhance the sector's environmental performance.

General principles

- Efficiency (best use possible of limited resources) and effectiveness (best strategy to achieve results) must always guide the selection of activities.
- Objectives are often best achieved by the selection of strategies whose components have amplifying effects, rather than individual measures.
- Empowering farmers through participatory engagement (farmer field schools and other training means) to make informed decisions should be a constant element to secure effectiveness and develop capacities.
- The development of skills and the availability of the resources requited to make use of increased knowledge and capacities should always be promoted where necessary.
- Progress should be measurable. SMART performance indicators must be developed for the most critical expected results.

Soil and water conservation (Technical Issue 1)

- SPTA3 should promote soil and water conservation as an integrating policy focus, and it should be *effectively implemented as an integrated approach*. [modified - top-priority]
- Water scarcity is not yet a major concern for the agriculture sector; however, it is becoming a concern at an inter-sector level, and water use efficiency should be incorporated into the irrigation subsector. [introduced for first time - medium priority]

- Focus should be on activities that are the most cost-effective (e.g. in relation to less resource-intensive soil erosion control), and serving a purpose (e.g. species and varieties for agro-forestry must be selected based on the choice purpose. [reinforced/increased – top priority]
- It is critical that monitoring of soil erosion control gives an objective account of progress, with comparable reporting across the country. [continued – top priority]

Acidity correction and nutrient management (Technical Issue 2)

- Soil conditions for improved yields cannot rely solely on increasing the application of inorganic fertilisers, however necessary these may be. From the perspectives of optimal use of scarce resources (soil), minimisation of environmental risks and impacts, and building resilience for climate variability and climate change adaptation, the focus should change to one of increasing yields with optimisation in use of inputs. [modified – top priority]
- Two main dimensions to consider in SPTA3 are: managing acidity (an important limiting factor for crop yields) and optimising use of fertilisers. In response to this, SPTA3 will need to dedicate more efforts to secure acidity correction. [reinforced/increased – top priority]
- As well, and very importantly, the focus on increasing use of inorganic fertilisers needs to be changed to one of application of fertilisers based on nutrient needs. Such change will require fundamental changes in monitoring. [reinforced/increased – top priority]
- The focus on efficient use of fertilisers requires the necessary training and capacity building, always keeping in mind the principle of empowering farmers to make informed decisions. [reinforced/increased – high priority]

Crop and variety selection (Technical Issue 3)

- Choice of crops and varieties is central to CIP, and of key importance to secure livelihoods and food security. The CIP is the cornerstone strategy relevant to this issue. However, and in spite of the dramatic increases in crop yields associated, various aspects of the focus currently given to the CIP are increasingly being questioned (e.g. on aspects of resilience to climatic shocks, social acceptance, economic feasibility).
- SPTA3 offers a key opportunity to re-shape the CIP in order to better secure its objectives in an environmentally sustainable manner. More specifically the following aspects should be given due consideration and effectively incorporated:
  - do not set aside the possibility of inter-cropping, which can be highly beneficial in terms of pest and disease management and nutrient management (reducing inorganic fertiliser requirements); [introduced for first time – high priority]
  - build flexibility for decision-making of crops and varieties by farmers, developing farmers' know-how and skills to make informed choices – flexibility is important for adaptation to climate variability and climate change; [introduced for first time – high priority]
  - build adaptation capacities to climate variability and climate change by requiring all CIP schemes to be accompanied by weather insurance – important in a farming system that increases farmers' vulnerability to climatic shocks. [reinforced/increased – high priority]

Pest and disease management (Technical Issue 4)

- The approach to pest and disease management so far has been centred on the increase in use of pesticides, to the extent that the amounts of pesticides used is taken as an indication of performance in the sector. Considering the environmental and health risks associated to the use of pesticides, this

focus is inconsistent with the principles of environmental sustainability and optimal use of scarce resources.

- SPTA3 should change the focus to one where environmental and health risks are minimised. This means using pesticides only when necessary and only in the amounts necessary, as well as fomenting cost effective measures that reduce the need of pesticides. [modified – high priority]
- Various aspects related to safe management of pesticides are to be addressed by other institutions (e.g. RBS), but MINAGRI should be concerned with the review of manufacturers' instructions so they are suitable for local conditions and labelled in Kinyarwanda. [modified – high priority]

Rural feeder roads (Technical Issue 5)

- MINAGRI can contribute to enhance effectiveness in this sub-sector by providing guidelines to District Development Committees on criteria for prioritising feeder roads, such that ICM orientation is taken into account. [reinforced/increased – high priority]

Monitoring and evaluation (Systemic Issue 1)

- Apart from specific environment-agriculture indicators, which are recommended under some of the technical issues, there are some overarching aspects related to MINAGRI's own M&E system that require attention in order to ensure M&E can contribute effectively to planning and decision-making.
- Inter-sectoral coordination is fundamental, as different sectors and subsectors have objectives and indicators that relate to the agriculture sector. It should be MINAGRI's role to coordinate these different actors and agree on a harmonised set of indicators (and their associated methodologies). [reinforced/increased – high priority]
- An important shortcoming is that monitoring data and information is not readily available for all authorities concerned; such a harmonised reporting framework should be promoted by MINECOFIN, but MINAGRI is to make an important contribution. [reinforced/increased – high priority]
- Progress of SPTA2 has not been measured in a systematic basis. This should not be repeated under SPTA3, where proper monitoring and reporting mechanisms should be defined as part of the strategy and all key indicators should be SMART, supported by Metadata and have a defined methodology to measure them. [modified – high priority]

Climate variability and climate change (Systemic Issue 2)

- Many of the strategies and activities promoted in the agriculture sector have benefits in terms of climate change adaptation. However there are some approaches that may be reducing adaptation capacities (e.g. in relation to CIP crop and variety selection, see above), and there are also further opportunities to enhance climate change adaptation and the contributions to climate change mitigation (e.g. in relation to rationalisation in use of fertilisers, increased weather crop insurance).
- The NSCCLCD sets the way forward to Rwanda's green growth. Importantly, two of the strategy's Programmes (on 'sustainable intensification of agriculture' and on 'agricultural diversity in local and export markets') are to be led by MINAGRI, and thus mainstreamed into SPTA3.
- MINAGRI should make climate change one of its key concerns; for this it will need to generate knowledge and capacities to better understand how the agriculture sector in Rwanda relates to climate change. Activities should include modelling of crop yields under different climate change scenarios, contributions to upgrade and use the EWS, favour climate resilient crops and farming methods

(including the protection of agro-biodiversity) and further promote farmers' weather insurance. [reinforced/increased – high priority]

Recommendations for non-agriculture sector institutions

Important opportunities were identified to enhance the environmental performance of the agriculture sector that are best addressed by institutional actors outside the agriculture sector.

MINIRENA and RNRA

- Being the government institution in charge of environmental policy aspects, and also responsible for implementing and monitoring the ENRSSP, MINIRENA should play a key role in coordinating with MINAGRI in all matters related to the environmental dimensions of SPTA3. [reinforced/increased – high priority]
- MINIRENA, together with the RNRA, should take primary responsibility for the development of an indicator measuring soil erosion, which will be key to monitor the effectiveness and, (especially) impact of soil erosion control measures. [reinforced/increased – medium priority]
- RNRA is already developing the system for monitoring of water quality. They should ensure that variables that give an indirect measure of soil erosion are included (i.e. TSS, TDS, turbidity). [reinforced/increased – medium priority]
- In terms of water use efficiency, the water balance study in charge of MINIRENA will be fundamental to determine availability of resources. Setting up the mechanism of water use allocations will be important to ensure good management of resources in the context of increasing water demand and climate change. [reinforced/increased – high priority]
- RNRA, with the possible support of NUR, should take in charge the regular monitoring of surface and groundwater quality to check for fertiliser and pesticide residues. [reinforced/increased – medium priority]
- MINIRENA should revisit the National Biodiversity Strategy, and devise appropriate measures for the protection of agro-biodiversity, which is potentially imperilled by the CIP, and which is important also in terms of climate change adaptation. An associated indicator would be useful in this context. [reinforced/increased – medium priority]

REMA and RDB (acting on behalf of REMA)

- The enhancement of the EIA system is fundamental to guarantee the environmental sustainability of agriculture sector development projects, especially with regards to the adequate implementation of EMPs and the strengthening of REMA's enforcement capacities. This exercise should include the integration of climate change considerations where and as appropriate.
- It is recommended that REMA undertake a comprehensive effectiveness assessment of its EIA system, in order to identify appropriate measures to strengthen it. [reinforced/increased – high priority]
- The EIA regulatory framework, including the EIA Guidelines, are well developed and powerful instruments; REMA and RDB should make better use of them. In particular the indication – in the EIA Certificates – that developers should submit annual monitoring reports to REMA will strengthen REMA's enforcement capacities, and also put more pressure for compliance on developers. [reinforced/increased – high priority]
- REMA, in coordination with MINIRENA, should clarify who is considered to be the 'developer' (for purposes of monitoring, reporting and for all other legal ends) in the case of long-term

operation of agricultural projects (e.g. rice field development/irrigation system handed over by donor-funded project to a farmers cooperative). [reinforced/increased – high priority]

MINALOC and Districts

- Districts will play a very important role in the implementation of most recommendations, normally in coordination with MINAGRI/RAB. Especially important, they should take a leading role in training of farmers, with a view to empower farmers to be able to make informed decisions on best farming practices. [reinforced/increased – high priority]
- MINALOC, in coordination with Districts should take a leading role in measures aimed at enhancing local capacities, including the clarification of job descriptions for agronomists and infrastructure officials and providing the necessary training. In some organograms will have to change to incorporate new structures and hire new personnel (e.g. Sector Infrastructure and Land Officers). Freeing up agronomists from non-agricultural and ENR functions will be key to enhance local capacities for environment-agriculture. [introduced for the first time – top priority]
- MINALOC is recommended to consider ways to enhance local capacities, including with regards to reducing the high levels of staff turnover. [reinforced/increased – top priority]
- MINALOC should be able to contribute significantly, in coordination with MINECOFIN (and other sector line ministries) to define a harmonised reporting framework for the M&E system, whereas the data/information MINALOC collects from the local level can be easily accessible to MINAGRI and MINIRENA. [reinforced/increased – high priority]

Rwanda Bureau of Standards (RBS) and Ministry of Health (MOH)

- RBS is to play an important role in setting up an adequate framework for the safe management of pesticides, including aspects of product standards, labelling, residues analyses. [reinforced/increased – high priority]
- The MOH should take an interest in the spot-checking, detection and quantification of pesticide residues in user blood samples. This is important to verify adequacy of the framework established for safe management of agrochemical products. [reinforced/increased – medium priority]

Rwanda Transport Development Authority (RTDA)

- Most recommendations to the RFR sub-sector are addressed to the RTDA. These concern especially the adoption of the necessary environmental standards, training of key actors in good environmental management practices, and contribution (in coordination with Districts) to create the job description for the new post of Infrastructure and Land Officer at the local level. [introduced for first time – high priority]

<u>Recommendations for enhancement of EDPRS2</u>

A key recommendation for the preparation of EDPRS is to shift the policy focus from increasing the amount of inorganic fertilisers applied, to one of increasing the amount of inorganic fertilisers applied AND that such application responds to soil nutrient needs.

Secondly from the time the EDPRS was written, the institutional level of awareness on climate change, and the corresponding policy focus have matured; climate change adaptation is now rightly recognised as an important aspect to address, especially due to the high level of vulnerability to climate change of the agriculture sector.

This SEA has shed light on important opportunities available to improve the environmental dimension of the agricultural sector. Although all recommended actions are considered important, some specific actions deserve special attention due to their particular potential to contribute significantly to increase the environmental performance of the agriculture sector in Rwanda. These deserve to be highlighted in the EDPRS2 'policy actions matrix', especially as these actions are meant to serve as triggers for the release of budget support funds.

Three key recommendations for enhancement of the environmental dimension of the EDPRS with regards to the agriculture sector are synthesised below.

1 Modify the indicator on intensity of use of fertilisers (in the intermediate indicators matrix), to one that clearly reflects the optimisation in its use. An appropriate measuring methodology should be developed. Some possible formulations to consider are:

- 'number of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit';
- 'tonnes of inorganic fertilisers/ha/yr applied based on estimation of soil nutrient needs'; and/or
- '% of total inorganic fertilisers applied whose application is based on estimation of soil nutrient needs'.

2 Make explicit reference in the SPTA3 document to the vulnerability of the agriculture sector to climate change, and the importance of adaptation.

3 Integrate, as part of the 'policy actions matrix', the following:

- Develop and implement a purpose-based agro-forestry strategy;
- Develop SPTA3 in line with recommendations made in the Strategic Environmental Assessment (SEA) of the agriculture sector in Rwanda.

Recommendations for the CPAF

Currently the CPAF contains only the following three indicators relevant to the environment-agriculture interactions[1]: (1) *'land portion protected against soil erosion (%)'*; (2) *'% of farming households using improved farm methods'*; and (3) *'% of water resources complying with water quality standard'*. As for the second indicator on up-take of improved farm methods, on examination of the methodology to measure the indicator, it is identified that 'improved farming methods' is related exclusively to the use of fertilisers (chemical and organic)[2].

The concept of 'improved farm methods' should be much wider than merely applying fertilisers; it should include the up-take of an Integrated Crop Management (ICM) approach, including aspects of up-take of agro-forestry and Integrated Pest Management (IPM). In any case, the use of fertilisers should be matched to the soil nutrient needs after any necessary correction of acidity.

A re-defined methodology for *'% of farming households using improved farm methods'* will not be provided here, as it will require further discussions amongst the agriculture SWAp community. However it is important that the aspects highlighted in the above paragraph are taken into account, especially the rational use of fertilisers. One possible formulation is: 'faming households that make use of soil acidity correction measures and fertilisers based on the assessment of soil nutrient needs, and which engage in ICM".

In addition, or as a complement, to the above indicators, it is recommended that the following indicators be integrated into the CPAF:

- No. of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit;
- ha of farm land under agro-forestry;
- No. of farmers exposed to Farmer Field Schools, with an ICM focus;

- No. of Districts where Infrastructure and Land Officers are functional (relieving agronomists of those functions);
- % of cultivated land under CIP with weather insurance.

Recommendations to the European Commission

General conditions for disbursement of tranches

The general conditions for disbursement of all tranches are linked to a set of general eligibility conditions. From the point of view of adequacy of the sector policy (in this case the SPTA), it is necessary that it is environmentally sustainable. When re-assessing for future disbursement the appropriateness of the sector policy, budget, monitoring systems, sector coordination and institutional capacities, the implementation of the recommendations drawn by the present Strategic Environmental Assessment (SEA) should be taken into account.

Performance Indicators for the disbursement of variable tranches

The most pressing environmental concerns in the agriculture sector should be reflected either in the performance indicators for the disbursement of variable tranches or at least be present amongst the issues to be raised in the on-going policy dialogue. It is recommended that the EC, within the context of the SBS Programme, gives special emphasis towards the following six indicators. The rationale is given in the right column.

	Performance Indicator
1	No. of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit
2	ha of arable land under agro-forestry
3	No. of farmers exposed to Farmer Field Schools, with an ICM focus
4	Law of Agrochemicals enacted and Registrar of agro-chemicals and inspection team functional
5	No. of Sectors where Infrastructure and Land Officers are functional (relieving Sector Agronomists of those functions)
6	% of cultivated land under CIP with weather insurance

Policy dialogue

There are some recommendations which are necessary to enhance the environmental performance of the agriculture sector, but which are beyond the sole responsibilities of the agricultural institutions. For this reason they have not been included in the aforementioned list of top priority agro-environmental performance indicators, but they should indeed be pursued in the wider policy dialogue of the EC and other Development Partners in Rwanda. Those issues should include, *inter alia*:

1. Harmonisation of environmental indicators relevant to the agriculture sector.
2. No. of annual monitoring reports submitted to REMA in context of EMP implementation
3. Development of a common ICT platform for M&E enabling effective computer access by all relevant Government institutions to M&E data and information under common formats.

Recommendations in the context of the SPSP to rural feeder roads

Dialogue was established by with the formulation team for RFR SPSP, with Ministry of Infrastructure (MININFRA) and the Rwanda Transport Development Agency (RTDA). Preliminary recommendations for integration of environment into the draft documentation offered for RFR SPSP formulation were provided to the RFR SPSP formulation team as follows based on the agreed condition of no significant change to RFR carriageway width (+/- 4 metres):

1. The Code of Practice and actual management systems of A) Supervising Engineers and B) Road Rehabilitation and Maintenance Contractors would need to incorporate Environmental Capability including capability related to the issues set out at 2 and 3 below;
2. The adopted Road Standard(s) would have to incorporate rigorous guidance and specifications for Vegetative Protection of Water Courses, Verges, Embankments and Cuttings and other earthen structures associated with RFR rehabilitation and maintenance, according to soil type and other geological and hydrological considerations;
3. Minimum road specifications applied to the respective implementation would require climate-proofing road design, so that roads and associated structures would be capable of sustaining greater intensity of rainfall as indicated by officially recorded trends.

The Table below synthesises the main indicators suggested for EDPRS2, CPAF and SPTA3. The indicators referred to for SPTA3 are only indicative, based on the activities suggested in this SEA report (NB: they may not be explicitly suggested as indicators in Sections 5-13 although, if actions are integrated into SPTA3, associated indicators would probably assume a wording similar to what is suggested in this table). The SPTA3 document will certainly include a broader range of indicators.

Proposed Indicators	EDPRS2	CPAF	SPTA3
• No. of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit; AND/OR • Tonnes of inorganic fertilisers/ha/yr applied based on estimation of soil nutrient needs; AND/OR • % of total inorganic fertilisers applied whose application is based on estimation of soil nutrient needs.	✓	✓	✓
Policy action: • Develop and implement a purpose-based agro-forestry strategy	✓		✓
Policy action: • Develop SPTA3 in line with recommendations made in the SEA of the agriculture sector in Rwanda	✓		
• ha of arable land under agro-forestry		✓	✓
• No. of farmers exposed to FFSs, with an ICM focus		✓	✓
• No. of districts where Infrastructure and Land Officers are functional (relieving agronomists of those functions)		✓	✓
• % of cultivated land under CIP with weather insurance		✓	✓
Policy action: • Devise and adopt Soil and Water Conservation Strategy			✓
Policy action: • Devise and adopt National awareness programme (farmers' awareness of benefits of soil and water conservation measures)			✓
• No. of extensionists trained on purpose-based agro-forestry			✓
• Water use efficiency for irrigation (Mm^3/ha/yr or Mm^3/t/yr)			✓
• No. of acidity correction trials completed for major land units			✓
• No. of nutrient management trials completed for staple crops in major land units			✓
• No. of extension workers including ToR and FFS trainers inducted into and tested for knowledge on acidity control and nutrient management			✓
• % coverage of early warning system			✓

• No. of crops for which IPM/Pest Risk Analysis protocols, field scouting frequencies and roguing practices are completed			✓
• No. of crops for which manuals on OPM/PRA have been developed			✓
• No. of farmers trained on climate change awareness			✓
• Indicators (as yet undefined) measuring protection of agro-biodiversity			✓
• % farming households covered by weather-related crop failure insurance policy			✓
Indicators proposed to be WITHDRAWN/MODIFIED	**EDPRS2**	**CPAF**	**SPTA3**
• % of farm households using inorganic mineral fertilisers	✓		✓
• % of farm households using organic fertilisers	✓		✓
• % of farm households using insecticides	✓		✓
• % of farming households using improved farm methods (definition of 'improved farm methods' to be modified)		✓	
• land portion protected against soil erosion (%) (measurement methodology to be modified so it reflects 'effective protection' and monitoring data can be comparable across the country)		✓	✓

SECTION A

BACKGROUND

Section A presents the background to the analytical components of the SEA. Chapter 1 provides a brief introduction to the agriculture sector in Rwanda in the context of the wider national development policy and the current and envisaged support to these strategies by the European Commission; it provides the rationale for carrying out this SEA, in light of the environmental sensitivity of the sector. Sector 2 describes the approach and methodology used in this particular SEA. Chapter 3 provides a description of the key sector (agriculture) and sub-sector (feeder roads) strategies. Chapter 4 describes the policy, institutional and regulatory framework relevant to the agriculture sector and the environment-agriculture interactions.

1 Introduction

Rwanda's economy is heavily dependent on the agriculture sector. Agriculture contributes about 34% of GDP (Rwanda SAKSS, 2011), employs about 88% of the economically active population (albeit much of it is seasonal) and is the main earner of foreign exchange, accounting for up to 80% of exports[1]. Agriculture is identified as one of the main motors for growth in Rwanda under Vision 2020 and the Economic Development and Poverty Reduction Strategy (EDPRS), due to its current contribution to the economy and its potential for growth.

The development of the agriculture sector is primarily guided by Rwanda's Strategic Programme for the Transformation of Agriculture II (SPTA2), complemented by other strategies, such as the National Post-Harvest Staple Crop Strategy (PHSCS). SPTA2 is currently under MINAGRI self-assessment and a Road Map has been established for planning of its successor SPTA3 (2013-17), which will feed into EDPRS2.

The European Union (EU), represented by the European Commission (EC), is providing assistance for implementing SPTA2 through a Sector Budget Support (SBS) Programme. The programme focuses on decentralisation in the sector and has a financial commitment of 20M€. A top-up of an additional 20M€ to the programme will also give special attention to aspects of food security, nutrition and environmental sustainability. The additional budget is also meant to contribute to implementation of the PHSCS, MINAGRI's contribution to implementation of the National Multi-sectoral Strategy to Eliminate Malnutrition in Rwanda, and to reinforce the institutional framework and capacities for fiscal decentralisation in the agriculture sector. As well, the EC will provide support to the rural feeder roads subsector in the form of a Sector Policy Support Programme (SPSP) indicated at 40 M€.

Agriculture is an 'environmentally sensitive' sector in three main respects. Its performance is highly linked with the quality of natural resources and strategies for its development can generate negative environmental externalities; however, such strategies can also provide opportunities of convergence to improve the state of the environment and contribute to climate change adaptation and low carbon development.

The Government of Rwanda's (GoR) is committed to sustainable development in general, and to an environmentally sustainable agricultural policy in particular. This Strategic Environmental Assessment (SEA) has as its primary objective to identify opportunities to enhance the environmental performance of the agriculture sector, so these may find their way into SPTA3 and the revised EDPRS. The SEA also provides recommendations for the EC to better integrate the environment in the formulation of its support to the agriculture sector and the rural feeder roads subsector.

Other donors will also find the findings from this SEA useful to prepare or mainstream their own support programmes to the agriculture sector from an environmental point of view. Due to the cross-cutting nature of the environment, the findings will not only be of use and interest to the agriculture sector institutions, but may find wider applicability in other sectors, including Environment and Natural Resources (ENR), local government, infrastructure and energy.

The findings of this SEA conclude into recommendations for the improvement of the environmental sustainability of SPTA-3 including, *inter alia*, with respect to the focus of Crop Intensification, giving special emphasis to soil acidity and nutrient management, pest and disease management, soil and water conservation and crop and variety selection. They also highlight opportunities to enhance environmental performance through actions concerning systemic issues such as agro-environmental M&E, mainstreaming of climate change and development of local capacities.

The SEA distinguishes for each proposed action leading and contributing agencies, and identifies other opportunities to enhance environmental performance in the agriculture sector that are better handled by the ENR competent authorities, including the strengthening of the Environmental Impact Assessment (EIA) system and opportunities to enhance environmental enforcement capacities.

2 Approach and methodology

This approach and methodology of the present SEA was based on international best practices as evidenced by the consideration of the guidance provided by the EC (EC, 2009), the OECD DAC (OECD DAC, 2006) and the Rwanda Environmental Management Authority (REMA, 2011b), as well as the team's own specific SEA experience. The methodological approach used is presented in the following paragraphs; a more detailed description is provided in Annexes A2a and A2b.

This SEA consisted of two key phases: a scoping study and an SEA study.

The **scoping** phase was oriented at making a preliminary identification of the key environmental concerns in the sector, taking into account both the effects of degraded natural resources in agricultural performance as well as the existing and potential impacts on the environment associated to actions in the agriculture sector. Based on these findings elements for the organisation of the main SEA study phase were identified, including the key issues that would deserve specific attention, the baseline information required and the areas targeted for site visits. The concept of **Key Issues** is critical to the SEA, as it allows focusing efforts and recommendations on those aspects that are really important, i.e. aspects that need to be solved to achieve a significant improvement in the environmental performance of the sector.

This preliminary identification of key issues was based on: (a) a comprehensive examination of all relevant policy and strategic documents (primarily SPAT2); (b) a mapping of the environment-agriculture interactions; (c) consultations with key stakeholders; (d) a field visit that allowed visiting a large agriculture development project and consultation with local actors; (e) the development of a Leopold-type matrix for the identification of potential environmental impacts and opportunities associated to SPTA2 implementation; and (f) a preliminary analysis of indicators from the main M&E systems to verify consistency and potential environmental implications associated to their use.

The preliminarily identified key issues were discussed and validated in a stakeholders' scoping workshop, attended by 41 participants from relevant government institutions and donors. Key Issues were prioritised based on expert judgement; findings of the scoping workshop; and determination of significance using a risk-focus assessment (see Annex A2a for a more detailed account of issue prioritisation).

The **SEA Study** phase assessed the key issues in detail and identified options to address them, i.e. options that would minimise environmental impacts and make best use of opportunities to enhance the state of the environment and the opportunities for climate change adaptation and mitigation. The analysis took into account the policy and regulatory framework, the institutional settings and the existing capacities.

The SEA Study made use of a combination of qualitative tools and methods, including:

(a) focused stakeholder consultations from a mix of actors (e.g. central and local level, farmers' organisations, donors, CSOs);
(b) field visits in the five Provinces, aimed at consulting with local level stakeholders, verify focus and effectiveness of projects and other agriculture initiatives at the local level, and obtain an appreciation of the challenges on site (see itinerary in Annex D3);
(c) consistency analysis of sectoral indicators across different M&E systems (consistency matrix);
(d) expert judgement; and
(e) a series of *ad hoc* supporting analyses (e.g. for M&E reporting flows; determination of staffing at local level; determination of budget allocations from different sources to specific environment-agriculture areas of attention; spatial analysis; appraisal of a sample of EIAs and their accompanying EMPs and EIA Certificates).

All activities were carried out in close coordination with MINAGRI. Field visits were organised in conjunction with RAB personnel; MINAGRI[1] (and sometimes RAB personnel) always accompanied the SEA team in field visits, allowing opportunities to verify findings with central level experience and also providing an opportunity to strengthen SEA-related capacities within MINAGRI.

Efforts were made to regularly consult with and brief the ENR sector. Regular communication was kept with MINAGRI to coordinate SEA activities[2] and cooperation was established with the team of consultants formulating the EC's SPSP for rural feeder roads.

Outputs from the application of some of these tools are available in Annex A2b, as well as the itinerary for the field visits (Annex D3). Synthesis of stakeholder meetings is found in Annex D5.

3 Agriculture and rural feeder roads strategies

Sector Programme for the Transformation of Agriculture – Phase II

SPTA2 (2009-12) builds up from the previous SPTA1. It integrates new policy developments, especially the Decentralization Policy of 2000, but also taking to account alignment with the EDPRS, the national long-term Vision 2020 and the National Investment Strategy.

The *Overall Objective* of SPTA2 is:

> *"Agricultural output and incomes increased rapidly under sustainable production systems and for all groups of farmers, and food security ensured for all the population".*

Its *Specific Objective* is:

> *"To increase output of all types of agricultural products with emphasis on export products, which have high potential and create large amounts of rural employment; this under sustainable modes of production".*

The backbone of SPTA2 consists of four interrelated Programmes, which are divided into 20 Sub-Programmes (SP). The Programmes and their objectives are shown in Table 1 below.

Table 1 SPTA2 programmes and their objectives

Programme 1: Intensification and development of sustainable production systems
Objectives: (i) create needed soil & water management structures; (ii) demonstrate to farmers and villagers the benefits of soil fertility-enhancing technologies; (iii) increase ownership of livestock and improve and intensify animal husbandry practices; and (iv) improve cultivation practices and develop sustainable production systems.
Programme 2: Support to the professionalization of producers
Objectives: (i) strengthen the sector's social capital base; (ii) provide producers with the organisational frameworks necessary to develop commercial linkages and function as entrepreneurs; and (iii) strengthen the entities in the sector charged with the development of productive technologies, applied knowledge and imparting this knowledge to farmers.
Programme 3: Promotion of commodity chains and agribusiness development
Objectives: create, through institutional reforms, investments and incentives, and environment which is favourable for farmers and agro-entrepreneurs to develop high-value products, including processed products, and to access the markets which will justify the investments in those areas.
Programme 4: Institutional development
Objectives: strengthen the institutional framework though which the public sector supports agricultural development.

SPTA2 is implemented through a sector-wide approach (SWAp), for which an MOU was signed in 2008 between the GoR and the main development partners, who form part of the Agriculture Sector Working Group (ASWG). Main partners in agriculture include the EC, the World Bank, IFAD, JICA, USAID, AfDB, FAO and BTC.

Progress indicators for the agriculture sector are contained primarily in: SPTA2; EDPRS; the Common Performance Assessment Framework (CPAF); Vision 2020; Donor PAF frameworks (e.g. under the EC's SBS Programme); agriculture-sector indicators contained in the Five Year Strategic Plan for Environment and Natural Resources (ENRSSP); and the recently-approved National Strategy for Climate Change and Low Carbon Development (NSCCLCD).

Progress is measured primarily through the bi-annual Joint Sector Reviews (JSRs), based on Vision 2020, EDPRS/CPAF indicators. The March JSR is backward-looking, whilst the September JSR is forward-looking.

Rural feeder roads planning

Under SPTA2, the PHSCS has the fundamental vision "to reduce food insecurity through an efficient post-harvest private sector system delivering staple foods to the people of Rwanda". Strategic Axis 2 is "Efficient and equitable transport systems across staple crop producing areas". In the PHSCS Action Plan, the overall target outcome of Axis 2 is defined as "reduced transport costs", with the following sub-objectives:

2.1 Investigate transport component of staple crop marketing costs;
2.2 Reduce road transport costs between production and secondary aggregation points in high potential areas; and
2.3 Address prioritized 'soft' constraints.

Activities foreseen include building and/or rehabilitating prioritized feeder roads, and demonstrating the impact of building or rehabilitating feeder roads. An indicator "improved feeder roads" has been set with specific targets (in the approved document "not less than 80 km feeder roads improved per year").

The EU has indicated willingness to coordinate joint monitoring, to be carried out with GoR and the other Development Partners active in the domain of rural roads (currently the Netherlands, USAID and WB) alongside the implementation of the SPSP and other programmes in place, with the aim of a performance assessment under an integrated approach.

Seven Districts have been identified to be targeted under the initial phase of EU SPSP for Rural Feeder Roads as follows: Bugesera, Huye, Muhanga, Ngoma, Ngororero, Rubavu and Rulindo. The respective Verifiable Indicators of Achievement may include cross-cutting measures including degree of utilisation of labour-intensive methods; participation in and leadership by women (e.g. in road maintenance contracts); and environmental sustainability compliance measures based on guidance offered by this SEA study.

4 Policy, institutional and regulatory framework[1]

Policy framework and key strategy documents

Key national policies are the Rwanda Vision 2020 and the EDPRS, to which all sector strategies must contribute. These policies establish the transformation of agriculture as a key pillar for development, especially through the increase of productivity. Their M&E systems give evidence of a focus on intensification and increase in use of inorganic fertilisers and pesticides; they also give evidence that soil erosion is a key concern to be addressed.

The most relevant sector policies from an environment-agriculture perspective are: the National Agriculture Policy (2004); National Environmental Policy; National Land Policy (2004); National Seed Policy (2007); National Forestry Policy (2010); National Policy for Water Resources Management (2011); Sector Policy on Water and Sanitation (2004); and National Decentralisation Policy (2000). Additionally the following must also be considered: Organic Law N° 08/2005 of 14/07/2005 determining the Use and Management of Land in Rwanda, Organic Law N° 04/2005 of 08/04/2005 determining the modality of protection, conservation and promotion of environment in Rwanda; Ministerial Order N° 004/2008 of 15/08/2008 establishing the list of works activities and projects that have to undertake an environmental impact assessment; Ministerial Order N° 005/2008 of 15/08/2008 establishing modalities of inspecting companies or activities that pollute the environment; and Ministerial Order N° 003/16.01 of 15/07/2010 preventing activities that pollute the atmosphere.

These policies are to a large extent consistent and supportive of each other with regards to environmental aspects of agriculture. Thus, for example, policies on agriculture, environment, land, and water resources management emphasise aspects of soil erosion protection and water conservation. Other points of

convergence are found in areas such as the promotion of agro-forestry (e.g. environment, forestry, agriculture). Also some policy documents (e.g. environment, forestry, land) establish objectives and indicators directly relevant to the agriculture sector.

There are, however, also some conflicting objectives; e.g. objectives related to intensification in use of pesticides and fertilisers can conflict with objectives on improving water quality; as well, objectives for marshland reclamation may conflict with objectives on wetlands protection. These potential conflicts have to be carefully examined.

Of an overarching nature, the National Decentralisation Policy deserves to be highlighted, as it establishes responsibility for implementation of actions in agriculture and ENR (amongst others) at the local level.

The way policies are implemented is specified in a series of sector strategies. The most relevant from an agriculture-environment perspective are: SPTA2; PHSCS; National Agricultural Extension Strategy (2009); 5-Year Strategic Plan for the Environment and Natural Resources Sub-Sector (ENRSSP); National Strategy for the Conservation of Biodiversity in Rwanda; and National Climate Change and Low Carbon Development Strategy (NSCCLCD).

These strategies show similar points of convergence as for their corresponding policies. The specific case of the NSCCLCD deserves special attention, as its first Programme relates to Sustainable Intensification of Agriculture, which will have to be addressed in SPTA3. Protection of agro-biodiversity is highlighted in the National Strategy for the Conservation of Biodiversity, in line with commitments under UN Convention on Biological Diversity (CBD). Also the agricultural extension strategy is important as it may be a vehicle for implementation of certain SEA recommendations requiring the strengthening of farmers' know-how and capacities.

Rwanda has a comprehensive policy and planning framework at national and sectorial level, and where the environmental dimension is integrated, and which serve as a solid reference for further programming. The corpus of policy and planning documents are largely consistent, but there are some aspects of harmonisation that deserve attention with regards to the consistency of environmental objectives; the most relevant aspects of harmonisation are further explored in this SEA.

Institutional framework

The key sector authority dealing with agriculture is the Ministry of Agriculture and Animal Resources (MINAGRI). From an ENR point of view, key strategic-level institutions are: Ministry of Natural Resources (MINIRENA), dealing with policy aspects; Rwanda Environmental Management Authority (REMA), which is the regulatory agency; and Rwanda Natural Resources Authority (RNRA), in charge of implementation.

Other relevant institutions include: the Ministry of Local Government (MINALOC); the Ministry of Infrastructure (MININFRA); the Ministry of Trade and Commerce (MINICOM); the Rwanda Agriculture Board (RAB); the Rwanda Development Board (RDB); and the Ministry of Finance and Economic Planning (MINECOFIN). At local level key institutions are Districts and Sectors. The approach to environmental mainstreaming[2] includes the secondment of REMA staff to key ministries (including MINAGRI) as environmental mainstreaming officers.

District Councils and Mayors[3] are elected at local level, and constitute the key institutions for planning and implementation, being responsible for implementing measures in agriculture and ENR. The Province level is reportedly being strengthened to help in coordination of M&E of District activities in concert with MINALOC. **Environmental Committees** are established at District, Sector and Cell levels, and assume responsibilities on certain environmental aspects, including on monitoring of forestry activities, soil erosion control measures and general environmental management.

There are five main fora that provide significant opportunities for mainstreaming the environment into the agriculture sector: (1) Integrated Development Programme (IDP); (2) Sector Working Groups (SWG); (3) Budget Call Circular (BCC); and (4) Imihigo.

Integrated Development Programmes (IDP) are "implementation frameworks for significant components of EDPRS which will be implemented almost exclusively at the local community levels and engage a wide range of stakeholders". IDP is overseen by an Inter-Ministerial Steering Committee (IMSC) chaired by MINALOC. **Sector Working Groups (SWG)** are established by the GoR and provide a forum for dialogue between different government institutions and donors. There is a SWG on agriculture as well as one on ENR.

The different ministries submit their budgets to MINECOFIN based on the **Budget Call Circular** (BCC). The BCC includes "sector specific guidelines for environmental mainstreaming" (Annex 17), with environmental objectives and indicative guidance on prioritised actions for environmental mainstreaming for the agriculture sector[4].

A key tool for reinforcing local government is the performance-based approach, "**Imihigo**". Through Imihigo local governments articulate their objectives and develop strategies to achieve them, in the form of **Performance Contracts** (PC), which are signed annually between districts and central government and between districts and lower-level local governments.

Rwanda has in place a solid set of institutions dealing with the environmental aspects of the agriculture sector, including arrangements for inter-sectoral and inter-institutional coordination. Issues that deserve attention are mainly related to the strengthening of capacities and the enhancement of coordination, as no aspects of major importance are present (as could be, e.g. important gaps in environmental governance, or important duplication of functions).

Regulatory framework

Rwanda has a limited corpus of environmental legislation, and is in process of developing new laws and regulations. Key pieces of legislation include Laws addressing land management (N°08/2005), environmental protection (N°04/2005) and conservation, protection and management of water resources (N°62/2008). Other relevant regulations, in the form of Ministerial Orders, address issues related to EIA procedures; procedures for environmental inspections; prevention of atmospheric pollution; and protected animal and plant species. Prime Ministerial Orders address the organisation of environmental committees, and establish a list of banned chemicals and other pollutants.

With regards to environmental regulations, this is based primarily on the EIA system, coupled with enforcement capacities through inspections and audits. The Organic Law on the environment establishes responsibilities on the state for soil erosion and pollution control; establishes responsibilities for environmental management at the local level; together with other pollution control provisions.

The Prime Minister's order N° 26/03 of 26/10/2008 determined the list of chemical and other prohibited pollutants. In addition, the **Law on Agrochemicals** recently approved by Cabinet awaits publication in the Official Gazette. It establishes environment- and health-related safeguards. MINAGRI's Directorate of Inspection Services will need to quantify 'baselines' and maximum residue limits of chemicals based on internationally credible practices in nearby African nations. Soil erosion control measures have been in force since 1982; the revised bill for the **Soil Erosion Law** is at Cabinet for review. Ministerial guidelines for district officials for implementation of the soil erosion law are already in circulation. Environmental **standards** have been adopted at a national level for effluent discharges.

Rwanda is also party to a number of international and regional **multilateral environmental agreements** that establish compromises for environmental protection. These include UN conventions: on Climate Change (UNFCCC) (and its associated Kyoto Protocol); on Biological Diversity (CBD); on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention); and to Combat Desertification (UNCCD).

The environmental regulatory framework remains weak in Rwanda, although it is subject of attention and advances are gradually being made. Especially challenging are the effectiveness of the EIA regulatory system (associated mainly to enforcement capacities) and the control and management of agrochemical products, and which are aspects subject of more detailed attention in this SEA report. Also of importance

in the short-term is the completion of the regulatory framework for the management of water resources (work in progress). The generation of adequate baselines (e.g. water quality and hydrological balance, effluent discharges) remains a challenge that needs to be solved in order to ensure adequate monitoring and enforcement.

SECTION B

ANALYSIS

The organisation of this Section enables focus on all the relevant dimensions of each key issue, its baseline and trends, and the way the issue is currently monitored. It heeds work in progress (including change management) and known commitments for additional allocation of resources. It identifies and evaluates respective impacts using a 'SWOT' approach encompassing legal/regulatory, institutional and implementation components. The respective analysis includes consideration of the potential opportunities for mitigation and optimisation measures and their acceleration.

Some of the issues are closely related, so achievements in one of the issues will be convergent with objectives from others. This is particularly the case with technical issues 1-4, which all respond to an integrated crop management approach.

5 Technical issue 1: Soil and water conservation[1]

5.1 Introduction

Low agricultural productivity in Rwanda is due to several factors, amongst which soil fertility decline is a major challenge due to soil erosion on one hand and continuous nutrient exportation from arable land. Soil erosion has been highlighted with a lot of concern, not only from an agricultural and environmental point of view but also from a national development perspective. Soil erosion control has been set as a priority at national level[2].

Soil erosion control is, however, but one specific aspect of a wider 'soil and water conservation' theme in land husbandry. An integrated approach, covering all dimensions of good land husbandry, should seek to enhance water retention capacities, so as to reduce run-off (and thereby reduce soil erosion and risks of flooding and landslides). Enhancing water retention requires keeping a vegetative cover; this is where agro-forestry plays an important role for on-farm activities, albeit maintaining soil cover in the fields can also be a contributing factor (e.g. mulching).

Ensuring water flows in the hydrological network so ecological services are guaranteed, but also economic services (e.g. for hydroelectricity, irrigation) must also be addressed. In terms of agriculture, this will help ensure water availability for irrigated agriculture, but also has implications for the design of irrigation schemes, so ecological water flows can be respected.

Finally, the integrated soil and water conservation approach must deal with issues of water quality; agriculture has a large potential of contamination, mainly through run-off of fertilisers and pesticides. These aspects are dealt with under Technical Issues 2 and 4 respectively.

In **agroforestry systems** there are symbiotic ecological and economical interactions between the different components. Based on a definition provided by ICRAF[3]1993, this report considers that:

Agroforestry in Rwanda is the collective name for integrated land management, where trees, shrubs, deep-rooted perennial grasses and their combinations, are principally maintained in spatial arrangement along contours and associated bund and terrace structures at horizontal intervals commensurate with geology, soil conditions, slope and rainfall on the same land management unit as agricultural crops to provide:

- *environmental services that underpin agricultural sustainability; these include soil and water retention, foliar mulch and composts and (leguminous species) nitrogen fixation; and*
- *production of forage, wood, and other products for animal husbandry, subsistence and commercial purposes.*

5.2 Policy and regulatory framework

Main relevant policy documents are: Vision 2020; EDPRS; National Agriculture Policy; and SPTA2. The National Environmental Policy (and ENRSSP) and the NSCCLCD are also directly relevant.

The soil and water conservation approach is referred to in key policies and strategies. Policy initiatives (e.g. under SPTA2 and ENRSSP) address agro-forestry as a way to enhance water conservation and contribute to erosion control[4], although it also has other benefits (e.g. slope stabilisation, production of fodder and fuel wood). Nevertheless soil erosion control and agro-forestry remain largely detached in terms of implementation.

In the case of agro-forestry, the EDPRS puts forward a series of actions under the banner of forestry, and which include the "intensification of agro-forestry in order to improve agricultural productivity". Agro-forestry is taken up in SPTA2. The Forestry Policy includes a Policy Statement (No 5) on Farm Forestry: "Tree-growing shall be promoted in all farming systems to boost land productivity, increase income and improve food security and a responsive forestry extension service developed".

Under the framework environmental law[5], soil and subsoil receive a high level of protection. In this context the State is responsible for establishing measures to control soil erosion and rehabilitate degraded soils. Decentralised entities are responsible for "ensuring activities related to better management of land, especially controlling soil erosion…"

In terms of management of water resources at a watershed level, key regulations are Organic Laws Nº 04/2005 and 62/2008. Decentralised entities are given responsibility for "efficient management of rivers, lakes, sources of water and underground water", as well as for the "efficient management and effective use of swamps".

IWRM is a relatively new concept for water management in Rwanda and the framework law on water management[6] is relatively recent (2008). Law Nº62/2008 is not very clear on the IWRM focus for catchment management, which appears in a more explicit manner in the National Policy for Water Resources Management (2011)[7]. Nevertheless Law 62/2008 established some basic principles and responsibilities for water management relevant to the agriculture sector, including importantly the establishment of a Water Inter-ministerial Committee and the devolution of WRM functions to district level and user organisations. Not all of these aspects have been implemented to date.

The National Policy for Water Resources Management has recently been updated (April, 2011) in order to respond to the new context established by Law 62/2008 and other changes in the national planning context. The Water Resources Policy defines strategic actions, many of which are aimed at implementing Law 62/2008. Amongst these, we may highlight the establishment and operationalization of a water inter-ministerial coordination committee to co-ordinate WRM across all sectors of government; the formulation of principles for the allocation of water resources; institute measures to designate ecological water flows ('reserve water'); and institute a system of permits and authorisations for uses of water[8]. To date the IWRM Master Plan is in process of development.

5.3 Institutional framework

The key institution for soil and water conservation in agriculture at a policy level is MINAGRI; at an implementation level it is RAB and District administrations, including MINALOC. MINECOFIN plays an important role in providing earmarked resources. MINIRENA retains deep interest in soil erosion control from a NR protection point of view and has acquired new responsibilities on climate change issues under the NSCCLCD.

In terms of water management, four ministries share responsibilities: MINIRENA, MINAGRI, MININFRA and MINALOC. The line ministry for water resources is MINIRENA; MININFRA deals with rural and urban water supply, urban sanitation and water sewerage service management. The Energy, Water and Sanitation Authority (EWSA) has charge of the implementation of the National Policy and Strategy for Water Supply and Sanitation Services; it is also in charge of implementing the infrastructure works for, e.g. water supply, urban sanitation and sewerage. Rural water services are responsibility of the district administrations and the actual management of services is contracted to private service providers and community-based water management authorities. MINAGRI deals with irrigation and marshland development.

5.4 Baseline

SPTA2 addresses 'soil and water conservation' (SP1.1 'sustainable management of natural resources and water and soil conservation). The priority lines of action (SPTA2 Table 11) narrows it down to construction of valley dams and reservoirs with conveyance structures, preparation of watershed management plans and soil erosion protection structures.

Soil loss and soil depth are among limiting factors for agricultural productivity, to which various factors contribute[9]. According to the FAO about 40% of Rwanda's land is classified as being under a "very high risk" of erosion and about 37% requiring soil retention measures before cultivation, only 23,4% of the

land not prone to erosion (MINAGRI, 2009). A high proportion of soils (especially in the Eastern half of the country) additionally have high acidity that inhibits nutrient buffering capacity.

As part of this SEA Districts have been classified according to the proportion of their land area with slopes larger than 16%, which gives an indication of priorities for soil erosion control.

Figure 1. Prioritisation of Districts based on % land of slope exceeding 16% (SAFEGE, Nov. 2011)

		National and Districts' Area Coverage (Ha) of Five Slope Categories									
No	Slope category	0-6%	6-16%	16-40%	40-60%	>60%	Total	>40%	>40%	>16%	>16%
	Colourcode							=>	%land in the	=>	%land in the
	District							(Ha)	District	(Ha)	District
1	Ngororero	2,110	9,056	45,019	11,296	417	**67,899**	11,713	**17**	56,732	**84**
2	Gakenke	3,047	10,441	39,786	15,535	1,597	**70,406**	17,131	**24**	56,918	**81**
3	Rulindo	4,006	8,925	29,320	13,364	1,084	**56,698**	14,448	**25**	43,768	**77**
4	Gicumbi	5507	13525	45016	17927	955	**82,930**	18,883	**23**	63,898	**77**
5	Karongi	3,294	15,369	50,574	9,476	507	**79,220**	9,983	**13**	60,557	**76**
6	Rutsiro	2,889	14,002	42,215	5,967	345	**65,419**	6,312	**10**	48,527	**74**
7	Muhanga	3,564	14,459	36,965	8,233	1,551	**64,771**	9,784	**15**	46,748	**72**
8	Nyabihu	5989	9208	27943	9808	732	**53,130**	10,039	**19**	37,983	**71**
9	Nyamagabe	5,896	25,677	67,869	9,158	486	**109,086**	9,594	**9**	77,463	**71**
10	Nyamasheke	6628	22739	54900	9374	889	**94,530**	10,262	**11**	65,162	**69**
11	Nyaruguru	6,153	26,070	63,826	4,774	95	**100,918**	4,869	**5**	68,695	**68**
12	Rusizi	9,086	22,233	48,416	8,995	1,680	**90,411**	10,676	**12**	59,092	**65**
13	Burera	17,019	12,114	23,957	10,131	1,125	**64,346**	11,256	**17**	35,213	**55**
14	Huye	5655	22580	27748	2102	68	**58,153**	2,169	**4**	29,918	**51**
15	Gasabo	5,277	15,690	19,190	2,634	128	**42,919**	2,762	**6**	21,952	**51**
16	Nyarugenge	2842	3794	5814	893	52	**13,395**	946	**7**	6,760	**50**
17	Gisagara	11,676	23,378	31,862	904	3	**67,823**	907	**1**	32,769	**48**
18	Kamonyi	8,886	25,749	28,706	2,057	154	**65,553**	2,211	**3**	30,917	**47**
19	Nyanza	9,344	31,436	24,838	1,523	60	**67,201**	1,583	**2**	26,421	**39**
20	Musanze	18473	15062	15669	3128	613	**52,945**	3,741	**7**	19,410	**37**
21	Ruhango	8,295	31,956	21,511	894	22	**62,678**	916	**1**	22,427	**36**
22	Rubavu	12,857	9,618	9,537	1,858	164	**34,035**	2,022	**6**	11,559	**34**
23	Kirehe	39,234	45,463	32,237	1,319	69	**118,322**	1,388	**1**	33,625	**28**
24	Rwamagana	15,102	34,635	17,911	539	9	**68,196**	548	**1**	18,459	**27**
25	Gatsibo	48688	66955	37776	4525	246	**158,191**	4,772	**3**	42,548	**27**
26	Ngoma	30,272	33,992	21,883	610	2	**86,760**	613	**1**	22,496	**26**
27	Kayonza	86578	64165	41275	1412	31	**193,461**	1,443	**1**	42,718	**22**
28	Kicukiro	5,623	8,266	2,760	22	-	**16,671**	22	**0**	2,782	**17**
29	Nyagatare	71,945	98,248	17,167	3,858	564	**191,782**	4,422	**2**	21,589	**11**
30	Bugesera	70290	54150	4555	4555	16	**133,566**	4,571	**3**	9,126	**7**
NATIONAL TOTALS		**526,177**	**788,957**	**936,245**	**166,372**	**13,615**	**2,431,366**	**179,987**	**7**	**1,116,232**	**46**
NATIONAL PERCENT'S		**21.64**	**32.45**	**38.51**	**6.84**	**0.56**	**100.00**		**7**		**46**
	Slope category	0-6%	6-16%	16-40%	40-60%	>60%		>40%	>40%	>16%	>16%
	Colourcode							=>	%land	=>	%land

About 15 million t of soil is lost annually[10]. This has been translated to represent a decline in the country's capacity to feed 40,000 people/yr, as well as an annual economic loss of 34,320,000USD, or almost 2% of GDP equivalent (REMA/PEI, 2006 cited in REMA, 2009)[11].

More recent soil loss estimations were carried out by a UNEP team (UNEP, 2011) based on GIS modelling. These results suggest that 47% and 34% of the country is experiencing soil erosion rates of between 50 and 100 t/ha/yr respectively[12]. These estimates were consistent with the very large amounts of sediment deposition found in four core samples from selected water bodies, as well as with measurements on degree of turbidity in surface waters[13]. Owing to their steeper terrain and higher annual rainfall, it is considered that the farmed Northern and Western uplands of Rwanda are the most vulnerable to erosion and should be prioritised in any new policy for reinforcing soil protection.

Different soil erosion control measures have been implemented in Rwanda. These include afforestation/reforestation, grass strips, progressive terraces and radical terraces. However the focus has been on resource-intensive structures, primarily radical terraces, mainly through large donor-funded projects such as KWAMP, LWH and RSSP[14].

According to the most recent JSR for the agriculture sector (09/2011)[15], in 2010 87.3% of land was under some form of soil erosion protection. This is an important improvement with respect to 2010 (80%) and, especially, the 2000 baseline (20%). There are however, as specified below, several shortcomings regarding the way this indicator is formulated and applied. It has been noted in the dialogue for the finalisation of this report that *"a policy action for a quantitative methodology to evaluate soil erosion infrastructures is being elaborated by MINAGRI in RAB; different development partners and stakeholders will play a greater role in validating and the implementation of the proposed new methodology."*

The indicator currently used for monitoring the proportion of arable land under soil erosion control is highly subjective, and there are concerns that it is not objectively capturing progress made. For a start the methodology specified (NISR, 2008) for applying the indicator is very broadly defined and prone to multiple interpretations: *"the area of land currently surrounded by 'a terrace, a watershed or any other erosion control tool' as a percentage of total area of arable land"*. There is no definition of what is an 'erosion control tool'; as well, a 'watershed' is a hydrographic delimitation, which is not related necessarily to soil erosion protection (all land is part of a particular watershed!). The indicator is to be measured based on 'administrative records' (the Metadata document does not specify which are these 'administrative records'). These shortcomings have been recognised by all key actors in the sector, and steps have been taken to develop a modified indicator; the review of the soil erosion indicator and assessment methodology has been defined by the sector as a policy action target to be achieved by the end of FY 2011/12. As well there is no measure on the sustainability of the soil erosion protection measures (e.g. maintenance of terraces, including ensuring continuous vegetative cover); thus, there is a risk that un-maintained and thus ineffective structures are counted as 'soil protection'[16].

Obstacles to adoption of soil conservation measures also have to be addressed. It has been pointed out that farmer investment in soil conservation measures does not depend only on exposure to extension services, but also depends on availability of resources, especially own labour at critical seasons, land tenure security and perception of benefits (Clay *et al*, 1998 cited in UNEP, 2011). This implies that MINAGRI should look into aspects such as financing of low-scale soil protection at the house-hold level, and ensure benefits of soil protection are well understood, e.g. through demonstration plots and through FFS.

In terms of **agroforestry** (closely associated to progressive terracing), there are important gaps in statistical information, as none of the M&E systems are currently monitoring its implementation[17] (data gaps include aspects such as: arable land surface under agro-forestry), so it is not possible to give an indication of the baseline. The activities that have been carried out have to a large extent not been designed taking into account the desired purpose, necessary for crop and variety selection.

Other soil and water conservation measures are not receiving significant attention. Farmers traditionally use some conservation practices, e.g. mulching[18], but data and statistics are not available to ascertain degree of up-take and geographical coverage.

At the moment **water availability** has not been an issue; in the agriculture sector rain-fed agriculture dominates the scene, and irrigation schemes are newcomers. It is not known what is the water balance in the different watersheds and, although Water Users Associations have been formed in some projects, no effective water management is in place. All this is currently in the process of radical change, with the preparation of an integrated water resources management strategy and the foreseen preparation of hydrological water balance.

5.5 Trends

It is not possible to make a projection on soil erosion due to the lack of monitoring data but it is noted that a new methodology is to be developed. To date no regular monitoring has been carried out of soil erosion rates, either directly or indirectly (e.g. TSS and TDS in river and streams) and the existing information is only indicative. However the GoR is embarking in enhancing the environmental monitoring system (in the framework of the Rwanda Environmental Information Network, which is an inter-sectoral effort coordinated by REMA), for which an indicator on rate of soil erosion (tonnes/ha/yr) has already been proposed (see REMA, 2011). Also work is in progress to establish a water quality monitoring system, including variables that will be able to give an indirect measure of soil erosion)[19].

In spite the indicator on 'arable land under soil erosion protection' is likely to be overestimating the degree of improvement, we can be relatively confident that the trend has been an upwards one, due to the efforts that have been carried out in recent years to construct radical and progressive terraces (mainly through large projects), as well as efforts at soil erosion control promoted by NGOs. However trends also depend on how other variables that act as drivers of soil erosion behave, including deforestation and farming practices (e.g. uptake of Conservation Agriculture practices), for which there is also lack of reliable monitoring data. As well expected effects of climate change include a very likely increase in rainfall, which will exacerbate soil erosion through run-off, especially in a context of increased deforestation.

In a similar note, it is not possible to establish trends for up-take of agro-forestry due to the lack of monitoring data. In this case pressure for improvement is not very high, as this variable is not being measured within the main M&E frameworks, although targets related to agroforestry are sometimes included within local level performance contracts.

Other GoR policies and actions will prove convergent with the objectives of soil and water conservation, such as improvements in land security through land titling and the enhancement of extension services provided by RAB through traditional means and Farmer Filed Schools, and in partnership with the contracted private service providers such as INGABO and Forrest Company.

In terms of water availability, it is recognised (and acknowledged in Vision 2020) that water is becoming increasingly scarce. Initiatives in various water-consuming sectors will increase pressure on water resources, added to which the effects of climate change may contribute. Developments in IWRM are underway, and should set up an appropriate system for the management of water resources, including allocation of water rights to different uses and the identification of ecological water flows.

Irrigation potential in Rwanda is 590,000 ha; by mid-2011 some 17,000 ha were under irrigation[20]. The Seven Years Government Plan aims at achieving 100,000 ha under irrigation by 2017, including 65,000 ha of marshlands and 35,000 ha of hillsides. The CIP will exert an important demand on water resources: area under irrigation is expected to increase from 15,000 to 24,000 ha; hillside area irrigated will expand from 130 to 1,100 ha, whilst reclaimed marshland will increase from 11,105 to 31,500 ha (National Policy for Water Resources Management 2011).

Rwanda also has plans to expand its electricity production through hydroelectric power plants; the objective under Vision 2020 is that at least 35% of the population will be connected to electricity.

Electricity from hydropower is increasing from 69MW (2009) to 130MW (2012)[21]. The National Hydropower Atlas project identified 333 micro- and mini- hydropower sites in the country with a combined capacity of 96 MW[22] and exploration of other potential sites for small and large-scale multi-purpose dams is underway.

According to the National Policy and Strategy for Water Supply and Sanitation Services, rural water supply is expected to increase to 85% by 2012 and 100% by 2020. Other developments will also be competing for water resources, including expansion of agro-industrial activities (promoted under SPTA2), agro-forestry and livestock development.

5.6 SWOT analysis

A SWOT analysis is presented below, synthesising strengths, weaknesses, opportunities and threats taken into account in the formulation of an approach to this issue.

Table 2 SWOT analysis for Technical Issue 1 on soil and water conservation

Strengths	**Weaknesses**
• GoR is highly committed to soil erosion control • High level of commitment to agro-forestry • Accumulated experience on soil erosion control through terracing • Significant donor support to soil erosion control • Sound regulatory framework for IWRM in place • High level acknowledgement of pressure on water resources • Water Users Associations begin to be constituted	• Policy focus mainly on soil erosion control, separately on agro-forestry, and only at a low level on other soil and water protection measures, not integrated • Indicator on arable land under soil erosion control is ambiguously defined • Soil erosion control resource-intensive measures are prioritised • In some cases neglect of maintenance of terraces • Limited capacities at decentralized level to address soil erosion control, agro-forestry and other soil and water conservation measures • Agro-forestry is not reflected in the main M&E frameworks • Agro-forestry to a large extent is not being explicitly designed with a 'purpose-based' approach • Absence of a water balance for the country
Opportunities	**Threats**
• Soil management plan and strategy being developed by RAB. • Indicator on soil erosion is proposed • Surface water quality monitoring system will be developed (indirect measure of soil erosion) • Indicator on arable land under soil erosion protection is going to be reformulated • Farmers committed to soil erosion control • Recognition of soil erosion and water conservation as an area of key concern (incl. agro-forestry) • Land titling will provide incentives for farmers to invest in soil and water conservation measures • Agro-forestry convergent with the One Cow programme - potential to provide fodder	• Population growth will increase pressure on land and forest resources • Climate change may exacerbate soil erosion through increased rainfalls and flooding • Important increase in water demand expected from various sectors (e.g. agriculture, industry, energy, sanitation)

• Measures in agro-forestry convergent with climate change adaptation • Soil and water conservation measures will contribute to climate change adaptation • IWRM institutions to be shortly put in place	

5.7 Synthesis, proposed specific objectives and required results

Addressing this key issue will require, fundamentally, a change at the policy level. Policy would have to shift to a focus on integrated soil and water conservation. This will imply giving more attention to the up-take of agro-forestry and other water conservation practices, and which will therefore deserve to be reflected in the list of performance indicators.

Being established at a policy level, the principles of soil and water conservation will have to permeate into all related activities in the sector, including its consideration and implications for the CIP. As well efficiency and effectiveness considerations call for the inclusion of other land protection measures besides resource-intensive radical terraces.

The associated indicators will require attention, including the re-definition for the indicator on proportion of arable land under soil erosion control, highlighting an indicator on agro-forestry and considering the integration of a measure of sustainability (e.g. in relation to maintenance of terraces and tree survival rate). There is also scope for the competent environmental institutions to aid monitoring of relevant variables associated to soil erosion, e.g. through the monitoring of variables that give an indirect measure of soil erosion (such as TSS, TDS, turbidity).

In the scenario of an increasingly water-scarce country, agriculture has to integrate the principle of water use efficiency in its irrigation schemes.

The proposed Specific Objective to address this key issue is: *a focus on integrated soil and water conservation guides the agriculture policy in addressing the problem of soil erosion and fomenting agro-forestry*.

The following Results are proposed to achieve the Specific Objective:

Result 1: Land is effectively protected against erosion

Result 2: On-farm water retention capacities are enhanced

Result 3: Water conservation at a watershed level is optimised

5.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
All Results (General activities)							
G1	Explicitly adopt an integrated soil and water conservation approach, addressing aspects such as soil erosion control, agro-forestry and soil-and-water-conservation-oriented farming practices[32].	MINAGRI	MINIRENA	Integration in broadened CIP design by MINAGRI-RAB-NUR-MINIRENA-RNRA Task Force	Soil and water conservation strategy devised and adopted	Strategy under implementation in N and W Provinces	Strategy under implementation in all Provinces
G2	Develop farmers' awareness of benefits of soil and water conservation measures.	RAB	Districts	Training of RAB Trainers (ToT); RAB Mobile Clinics; accelerated FFS programme	National awareness programme designed and funded	Programme reaches 25% farm population	Programme reaches 100% farm population
Result 1: Land is effectively protected against erosion							
1.1	Reformulate indicator on arable land under soil erosion ***protection*** (and methodology), so it reflects ***effective protection*** (e.g. addressing maintenance) and monitoring data can be comparable across the country.	MINAGRI-RAB	MINIRENA-RNRA NUR Districts	MINAGRI-RAB-NUR-MINIRENA-RNRA Task Force with indicator piloted before adoption. Training by RAB to local level staff responsible for monitoring.	Indicator formulated for trial	Piloting completed and results adopted	Adopted indicator under national implementation
1.2	Focus SPTA3 activities on development of less resource-intensive land protection approaches as complement to terracing	MINAGRI	RAB Districts	MINAGRI-RAB-NUR-MINIRENA-RNRA Task Force identification of required extension of results of previous and on-going ISAR-RAB-ICRAF research. ToT; Manuals; mass media; FFS	Review completed and drafts of manuals presented	Manuals, mass media and FFS disseminated to 25% of farm population	Manuals, mass media and FFS disseminated to 100% of farm population
1.3	Develop an indicator, and associated baseline, for the monitoring of soil ***erosion*** (tonnes/ha/yr), including the emplacement of necessary structures for monitoring. Train local level staff and farmers on associated monitoring and reporting.	MINIRENA-RNRA	RNRA MINAGRI RAB Districts	RNRA IWRMP design in consultation with MINAGRI; monitoring input to a wider indicator on soil erosion (that includes aspects such as mining	Indicator formulated for trial	Piloting completed and results adopted	Adopted indicator under national implementati

				and roads). Training by RNRA & RAB to local level staff responsible for monitoring.			on, including in Imihigo
1.4	Complement soil erosion monitoring analyses with reference to changes in key water quality parameters (to be monitored by RNRA) (e.g. TDS, TSS, turbidity).	RNRA	MINAGRI RAB Districts	RNRA IWRMP design to provide more rigorous analysis for reporting on soil conservation effectiveness.	Indicators formulated for trial	Piloting completed and results adopted	Adopted indicators under national implementation
Result 2: On-farm water retention capacities are enhanced							
2.1	Promote purpose-based agroforestry as part of SPTA3	MINAGRI RAB Districts	MINIRENA CICA	This involved participatory methods for identification of agro-forestry purpose, crops and varieties	Dev. specific agro-forestry + progressive terracing recommendations for all land units by RAB	Publish recommendations (CICA): 1000 manuals for each land unit	Reprint according to need
2.2	Train extensionist workers and farmers on purpose-based agro-forestry		MINIRENA		Pilot training (RAB) completed with 50 extensionists	Annual training by RAB of 500 extensionists	Idem.
2.3	Indicators on agroforestry effectiveness incorporated into SPTA3: e.g. ha arable land under agroforestry; or linear km at defined density/interval for each land unit. Indicator to be coordinated with MINIRENA/RNRA	MINAGRI	MINIRENA	Including piloting and training on application. Coordinated w/ MINIRENA	Indicators piloted	Indicator for each land unit adopted	Indicator applied
Result 3: Water conservation at a watershed level is optimised							
3.1	Water-use efficiency in irrigation is incorporated as principle in SPTA3	MINAGRI	MINIRENA RAB	RAB with experiences from RSSP	Develop efficiency criteria (RAB)	Water use/abstraction monitored - all irrigation development	Idem
3.2	Indicator developed for water use efficiency in irrigation, incorporated into SPTA3 and Imihigo	MINAGRI	MINIRENA RNRA	E.g. $Mm^3/ha/yr$ or $Mm^3/t/yr$	Indicator piloted	Indicator adopted	Indicator applied

3.3	Completion of water balance study	MINIRENA	RNRA			Study results published	
3.4	Allocation of water rights (based on water balance study) instituted in new agricultural developments then extended to all hydrological systems/units.	MINIRENA	RNRA	Taking into account also climate change			Allocations committed

6 Technical issue 2: Soil acidity and nutrient management

6.1 Introduction

Cultivated lands represent some 1.205 million ha (or 46% of the country), with around 59,000 ha of major cash crops (coffee, tea and sugar cane) (NISR, 2009). Rapidly rising rural population and the need to maximize food production to accommodate the 50% rise foreseen in the next 15 years are relevant linked issues and these are embraced by GoR commitment to MDG 1 to avert hunger. Soil acidity and nutrient management is a necessary foundation for all crop production and frequently the most sensitive limiting factor in yield optimization; moreover its relationship with zero-grazed livestock production is symbiotic.

Through its nationwide cadre of contracted private service providers, and through RAB, MINAGRI's SPTA2 actively promotes and subsidises fertiliser use as to some 50% in CIP staple crops; the fertiliser budget accounts for 80% of CIP expenditure. In some regions cultivation of traditional crops and their 'landrace' varieties, which often cope well with scarcity of soil nutrients, is discouraged by MINAGRI whose policy is to increase the participation of farmers in the market economy with production that is suitable for intra-regional trade and for the national food security reserve.

Consultations carried out in the field regarding CIP implementation suggest that insufficient economic and technical attention has been afforded at the policy level to correcting soil acidity in the naturally acidic soils that cover over one half of Rwanda, mostly in the Eastern sector: buffering capacity of such soils needs to be reinforced so that, under an inorganic fertiliser or mixed fertiliser regime the amount of unmineralised, exchangeable nutrients may be maximized. In this way it may be possible to make considerable gains in absolute output and efficiency of the application of CIP. Meanwhile RAB continues running a limited number of on-farm trials for a number of crops and varieties to determine optimum fertilizer application rates in defined land systems.

A number of producers and exporters to the EU and other markets in the coffee, tea and fresh horticultural produce sectors are bound to comply with numerous safe management practices under the GlobalGap standard and other standards and practices including HACCP (focusing on contamination prevention through hazard analysis and critical control points), imposed by importing nations which include a regime for keeping use of fertilisers, and so their residues, within safe limits. The regimes in place for these export sub-sectors are illustrative of the potential scope of the subject matter of this Chapter, which focuses on staple crops.

6.2 Policy and regulatory framework

Key national policies are the Rwanda Vision 2020 and the EDPRS in which the transformation of agriculture is a key pillar for development, with the current focus on increase of productivity. The respective M&E systems give evidence of a focus on intensification and increase in use of inorganic fertilisers and pesticides.

The most relevant sector policies to the subject matter of this issue are: the National Agriculture Policy; the National Fertiliser Strategy (NFS); National Environmental Policy; and the National Land Policy (2004). The Land Policy will be complemented by the National Land Use Plan (approved by Cabinet 2011, awaiting assent) and the associated intended District Land Use Plans (for integration in District Development Plans), which will be implemented with assistance from consultants in 2012. The NSCCLCD is also relevant, as fertilisers are the main source of GHG in Rwanda, and the strategy aims at optimising their use.

6.3 Institutional framework

The main institutions concerned with this issue are MINAGRI and its RAB[1] branches. Private service providers contracted by MINAGRI collaborate with RAB and District and Sector level Agronomists to support extension and implement fertiliser distribution[2].

6.4 Baseline

Relevant performance indicators as identified below are set at different levels and in different sectoral strategies. Based on a the CATALYST assessment that revealed low crop yields nationwide due to lack of fertility, the NFS was designed to support the CIP with input indicators for the use of fertilisers for which commensurate increases in staple crop yields were projected. The targets are defined in various policy and strategy documents as follows:

- 40 % of farms to be using inorganic fertilisers by 2012 (EDPRS); 25% (from 12%) in SPTA2 SP 1.5.1, with increase t of fertiliser imported from 14,000 to 56,000 by 2012, and the number of farmers organisations trained in fertilisers would rise to 70% by 2012. Other targets set are 15 kg/ha/yr (by 2020) in Vision 2020.
- 25% of farms (from 7%) to be using organic fertilisers by 2012 (EDPRS); same in SPTA2 SP 1.5.2.
- SPTA2 SP 1.5.6 set a modest target of the No. of fertiliser demonstration plots increased to 12 by 2012 while SP 1.5.7 aimed for 15 on-going participatory analyses of soils and fertilization.
- Under SPTA2 SP 1.5.3 20% of farms were projected to be applying trace elements to the soil by 2012 however due to the reorganisation associated with creation of RAB this is not yet under implementation[3].

Intensity of inorganic fertiliser use is the main 'pressure' measure of success (not only in SPTA2 but also at EDPRS and Vision 2020 levels); this undermines efficiency of resource use dimension, which is essential in terms of environmental sustainability and on minimising GHG emissions associated to fertilisers. Optimisation in use of fertilisers is also required for correct mainstreaming of the NSCCLCD.

Although soil acidity has been mapped for all land systems, soil nutrient levels of major land units for optimised cropping/land use have not yet been nationally determined and classified although this is intended under NFS (see below); there may be exceptions in (self-formulating) horticultural export and estate tea and coffee sectors.

Good regional and local experimentation in fertility management was done by the IFDC/CATALIST partnership with MINAGRI but the results and recommendations have not been thoroughly analysed and so have not been effectively communicated; the respective documentation has not been disseminated.

Soil nutrient research continues through the new 2011-14 RAB-AGRA (successor) pilot Fertiliser Recommendations Project, which includes un-mechanised trials on 24 AFSIS tracked plots for identification of limiting elements for each soil type/land unit. This is compliant with the requirements of Annex 17 of MINECOFIN's Budget Call Circular (BCC).

Linkage of One-Cow programme to organic manuring and cultivation of nitrogen-fixing legumes has been recognised by MINAGRI and is a cornerstone of the organic manuring SP of SPTA2, although advice received suggests that manure may only yield 1.8kg of exchangeable N/t of material while in vegetable-only compost the exchangeable N content may be one quarter of this amount.

Fertiliser use is generally considered too low at the moment to be a significant risk to the environment, although the sector needs to build appropriate environmental safeguards for the expected increase in fertiliser use. Targeted fertiliser subsidy support and related application rates recommended under CIP need to be verified for run-off/contamination risk in defined soil/slope conditions. The distribution of fertilisers under the CIP is a massive operation. In 2010/11 44,000 MT of fertilizers were imported; electronic auctions are organized every six months. A total of 14 private companies are involved in fertilizer distribution, 436 licensed fertilizers outlets are operational and 835 agro dealers have been trained in fertilizer management[4].

Water body contamination by fertilisers (and pesticide residues) is not monitored but a pilot NUR partnership with LWH project is developing routine detection and analysis methods that may be fed into formulation of IWRMP of RNRA; LWH-NUR analytical methods reveal dissolved nitrates sometimes close to upper limit for safe human consumption.

Linkages with the National Fertiliser Strategy

In the case of **liming**, soil acidity amelioration strategies are applied systematically by assisted projects such as RSSP and LWH but this is not reflected in the normal scheme of implementation of NFS (2007)[5]where there is focus on major nutrients without sufficient focus on lime, although both are given emphasis in the Strategy.

Travertine limestone is quarried in several locations in Rwanda and crushed stone can (based on analysis) be applied on acidic lands at the rate of some 5 to 7 t/ha[6]. This lime 'dressing' has the desired buffering effect on soil nutrient retention for up to 3 years or up to 6 crops. Even with composting of forest gleanings with farm manure and vegetative wastes, it may be unlikely that most farmers on low pH soils will ever achieve the organic matter balance that their soils require; liming may therefore become a permanently required practice that has an average material requirement of 1 t of stone/ha/crop and a material cost of about RWF35,000/ha/crop[7]. Effort of carrying limestone (its utilisation is some nine times the weight of N:P:K fertilisers) may be a limiting/inhibiting factor and is an important determinant of importance of penetration of rural feeder roads. *In the Eastern Sector of the country especially rural feeder road penetration may have very high linkage to the effectiveness of acidity correction.*

In the case of **inorganic** fertilisers, the 50% subsidised (assessed, voucher-based) fertiliser distribution programme under CIP and actual application rates recommended by private service providers mostly follow directed 'one-size-fits-all' approach due to lack of measured soil acidity and nutrient status. It is understood too that CIP NPK fertiliser application recommendations are not modelled on actual soil acidity/buffering capacity and the environmental impacts and economic effectiveness of the current CIP fertiliser strategy are yet to be determined. In its 2010 report, IFDC noted *"Measures……are needed to reduce the costs of fertilizers and to help adapt fertilizer recommendations to the crop and soil needs in order to bring them within the reach of the farmers."*

In this regard the intent of NFS is explicit. Its activity 3.1 is to "revise fertiliser recommendations through a participatory approach"[8]. It would also appear that to accelerate effectiveness of fertility formulations under CIP, there remains plenty of scope to truly activate the spirit of SPTA2 SP2.3 for Research for transforming agriculture[9].

6.5 Trends

The current mode of CIP implementation suggests that there will continue to be insufficient attention afforded to correcting soil acidity in the naturally acidic soils that cover over one half of Rwanda.

Use of inorganic fertilisers is expected to keep increasing, in conformity with CIP and set targets, posing an increased risk of environmental pollution if not accompanied by measures aimed at guaranteeing correct application.

In the context of contributing to climate change mitigation (i.e. reduction of GHG emissions), the NSCCLCD emphasises the rational use of fertilisers. When integrated into the agriculture sector strategy (SPTA3), these measures (which are fully in line with recommendations made in this SEA report) will help reduce the application of fertilisers, through the rationalisation of their use.

Promotion of organic composting and soil mulching will continue.

RAB fertility and yield research on trial plots will continue at its present small, dispersed scale and there may be some retrieval by RAB of relevant past fertility research results and their dissemination within RAB to its extension arm.

In order to respond to the relevant statements in its recent internal evaluation (as were reproduced in the first draft of this report), MINAGRI can be expected to consult with farming communities more closely in determining the optimum utilization of soil resources; there may be some reversion to traditional cropping patterns.

Formulation of IWRMP of RNRA can be expected to incorporate design of a comprehensive system of water quality monitoring in all major water bodies and enable checks on whether there is any fertiliser-caused chemical contamination; this system would also pick up contamination (unlikely) from farm livestock sources.

6.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats that are taken into account for the formulation of an approach to this issue.

Table 3 SWOT analysis for Soil Acidity and Nutrient Management

Strengths	Weaknesses
• Fertiliser use supports national crop intensification • Application of NFS has achieved some spectacular yield improvements • Fertiliser recommendations may be fully effective in non-acidic soils • Organic manuring and associated composting are well promoted by the extension community • 'One-cow' programme contributes to nutrient recycling in the manuring scheme	• Resources for soil fertility research remain limited • Lack of accurate nutrient deficit determination for respective land units and crops means soil may not be used optimally • Plant yield potential may be inhibited by mineralisation of (excess) fertiliser • In acidic soils NPK utilisation may be inhibited by lack of acidity correction
Opportunities	**Threats**
• NSCCLCD emphasises fertiliser application based on nutrient needs assessment • Intensification of RAB research into plant nutrition and soil nutrient corrections, with associated input-output economic analysis. • Lime formulation to suit land systems • Fertiliser measures appropriate to soil types and crops • Extension of rural feeder roads to facilitate delivery of limestone and fertilisers	• Continuation of poor yield performance • Abandonment of unproductive arable terraces and reversion to pasture/bush • CIP discourages inter-cropping, which has potential to reduce N needs • State Extension system promotes conventional farming (instead of farming based on indigenous knowledge and indigenous risk management)

6.7 Synthesis, proposed specific objectives and required results

From field consultations and further analysis it has been concluded that production and use of organic compost, and associated recycling of livestock manure, is already generally well promoted by MINAGRI and its partners and the benefits of composting and soil mulching are well understood by a majority of farming communities. The focus of this issue is therefore on inorganic measures for correcting soil deficiencies in such a way that environmental risks are minimised and land use optimised.

The proposed Specific Objective to address this key issue is: *Measures for soil acidity correction and nutrient management for staple crops are economically optimised for all major land units*

The following Results are proposed to achieve the Specific Objective:

Result 1: Economic soil acidity correction measures determined for all major land units

Result 2: Economic inorganic fertiliser application rates and frequencies for staple crops determined for all major land units

Result 3: Kinyarwanda manuals for regional fertiliser recommendations (from Results 1 & 2) distributed to extension workers and farmers

Result 4: CIP and other extension by RAB and contracted private service providers comply fully with Results 1 and 2

Result 5: IWRMP of RNRA incorporates regular monitoring of groundwater and water bodies for fertiliser leachate/contamination

6.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: Economic soil acidity correction measures determined for all major land units							
1.1	Analyse previous research results for acidity correction	RAB	NUR	RAB soil/plant nutrient research team	Completed / published		
1.2	Trials for acidity correction undertaken in all major land units where research and formulation has not been completed	RAB	NUR; AGRA; contracted research body	RAB scientists +fieldpersons; contracted research organisation	Progress report	Progress report	Publish recommendations (major land units)
Result 2: Economic inorganic fertiliser application rates and frequencies for staple crops determined for all major land units							
2.1	Previous research results for soil nutrient management of staple crops analysed	RAB	NUR	RAB soil/plant nutrient research team	Completed / published		
2.2	Trials for nutrient management undertaken for staple crops in major land units where research and formulation has not been completed	RAB	NUR; AGRA; contracted research body	RAB scientists and field-persons; contracted research organisation	Progress report	Progress report	Publish recommendations (major land units)
2.3	Define indicator on fertiliser application based on nutrient needs assessment (e.g. in terms of quantity fertilisers applied based nutrient needs assessment)	MINAGRI	RAB	See recommendations for EDPRS2 in Section C. Indicator to be integrated into EDPRS2 and SPTA2.	Indicator defined	Indicator piloted	Indicator adopted
Result 3: English, French and Kinyarwanda manuals for regional fertiliser recommendations (from Results 1 & 2) distributed to extension workers and farmers							
3.1	Publish manual on economic soil acidity correction and nutrient management (all land units)	RAB	CICA	CICA with funding of printing and distribution costs (20,000 copies)	-	-	Publication and distribution
Result 4: CIP and other extension by RAB and contracted private service providers comply fully with Results 1 and 2							
4.1	Extension workers incl. ToT and FFS trainers inducted into and tested for knowledge provided	RAB	Recipient organisations	RAB	-	-	Y1:100 trained/ certificated
4.2	Verification of effectiveness of soil nutrient management extension	NUR	-	NUR survey team	-	-	Y1: 1,000 farmers
Result 5: IWRMP of RNRA incorporates regular monitoring of groundwater and water bodies for fertiliser leachate/ contamination							
5.1	IWRMP of RNRA incorporates regular monitoring of groundwater and water bodies for fertiliser leachate/contamination (i.e. as for pesticides)	RNRA with possible support from NUR	Districts	RNRA with support of District Environmental Officers for sample collection	none	30% bore-holes, main rivers, lakes, reservoirs, annually	All boreholes and main rivers, lakes, reservoirs, annually

7 Technical issue 3: Crop and variety selection

7.1 Introduction

A key element of the CIP is the determination of priority crops and varieties to be grown in each area, under mono-cropping. Crop and variety selection is of high importance, not only in terms of economic value of the crops, but also in terms of food security, adaptation to climate variability and climate change and protection of agro-biodiversity. For example, in terms of adaptation to climate variability and climate change, it is common to plant different varieties of the same crop, whilst access to the gene pool of agro-biodiversity can be of high importance for adaptation to climatic shocks.

This issue is aligned closely with SPTA2 SP1.2 for integrated development and intensification of crops and livestock. The strategies embrace increases in production and exports of coffee, tea, horticulture, pyrethrum, etc. and consolidation of single-crop cropping including staples rice, maize, climbing beans, wheat, soya, Irish potato, sweet potato and cassava; sorghum mostly is not targeted by CIP.

MINAGRI reports that cultivated lands include 870,000ha of annual crops. Rapidly rising rural population and the need to maximize food production to accommodate the 50% rise foreseen in the next 15 years are relevant linked issues embraced by GoR commitment to MDG No 1 to avert hunger.

Correct crop selection and associated husbandry, including soil conservation, nutrient management and pest risk analysis and mitigation measures, are necessary foundations for optimized production, which collectively extension workers define as Integrated Crop Management (ICM). They also require the integration of climate change adaptation considerations, as well as examination of trends of change in farming systems and the impact of commodity-oriented production.

7.2 Policy and regulatory framework

Key national policies are Vision 2020 and the EDPRS in which the transformation of agriculture is a key pillar for development, with the current focus on increase of productivity. The respective M&E systems give evidence of a focus on increasing the output of staple crops and the measurement of the quantities of subsidized inputs applied.

The most relevant sector policies to the subject matter of this issue are: the National Agriculture Policy; the National Fertiliser Strategy; the National Environmental Policy; and the National Land Policy. The Land Policy will be complemented by the National Land Use Plan (approved by Cabinet 2011, awaiting assent) and the associated intended District Land Use Plans (for integration in District Development Plans). In terms of climate change, the NSCCLCD is the key reference policy document[1]; in terms of protection of agro-biodiversity the National Biodiversity Strategy and Action Plan is also relevant[2].

7.3 Institutional framework

With the focus of analysis falling mainly on the staple crops sector, key institutions concerned with this issue are MINAGRI, RAB and MINECOFIN, which supports planning processes and provides funding for supported inputs supply. Private service providers contracted by MINAGRI collaborate with RAB and District and Sector level agronomists to support extension and implement seed and fertiliser distribution[3]. From a climate change adaptation and protection of agro-biodiversity point of view, key institutions are REMA and MINIRENA.

7.4 Baseline

Performance indicators relevant to the environment-agriculture inter-linkages are set at different levels and in different sectoral strategies; SPTA2 SP1.2 for integrated development and intensification of crops and livestock is particularly relevant[4].

Through its nationwide cadre of contracted private service providers, and through RAB, SPTA2 actively promotes and subsidises as to 100% the supply of staple crop seeds under CIP, matched (see Issue T4) by subsidy of required fertilisers as to 50%[5]. Two matching voucher systems support the respective

distribution programmes; preliminary enquiries by the consultant team could not detect a structured link between the voucher programme and meteorological insurance that is offered to farmers in some Districts under a Banque Populaire scheme linked to District-based Meteorological Monitoring Stations of the Rwanda Meteorological Service although this could be a natural future arrangement to underwrite the programme.

RAB continues to operate a limited number of its own on-farm trials for a number of crops and varieties to determine optimum returns from inputs, including fertilisers, in defined land systems. These trials are few and dispersed; it additionally has a trial programme on 24 plots with AGRA.

Crop and variety choice can be a limiting factor in yield optimization, and so in staple food supply, especially in zones where there may be frequent vulnerability to climate variability, notably drought. In the East maize regularly has to confront such a regular risk while traditional landraces of sorghum have been noted to be relatively resilient to such conditions[6].

In some regions cultivation of traditional crops and their 'landrace' varieties, which often cope well with scarcity of soil nutrients, are not promoted by MINAGRI whose policy is to increase participation of farmers in the market economy with production that is suitable for intra-regional trade and for the national food security reserve. For the purposes of staple crop yield maximization, MINAGRI has also discouraged inter-cropping although the maize-and-climbing bean combination is a longstanding tradition. Discouragement of inter-cropping with legumes in many field situations can reduce options to minimise fertiliser use (nitrogen fixation) and may also exclude associated benefits that can keep pest levels below economic thresholds[7].

Mono-cropping, often with a narrowly limited range of improved varieties, poses a risk to agro-biodiversity. Access to agro-biodiversity gene pool can prove very important for adaptation to climatic (and other) shocks, and its protection is also a remit of MINIRENA under the obligations of the CDM. Unfortunately there is no comprehensive data yet compiled and available on agro-biodiversity resources in the country, on which to form a basis for planning in this area; nevertheless incipient work is starting to develop through the establishment of a gene bank in South RAB Zone. The implementation of the agro-biodiversity protection components established in the National Biodiversity Strategy and Action Plan has not received due attention although it has received some Parliamentary discussion. The Plan includes the following strategies: 'improved performance of native varieties and species', the 'promotion of sustainable traditional production species', the 'prevention of introduction of intrusive species, control and eradication of non-native species likely to threaten ecosystems and native species' and the 'development of mechanisms for checking the importation and dissemination of genetic material capable of having harmful effects on biodiversity, particularly on agro-biodiversity'. Also relevant are the objectives aimed at managing the risks of biotechnology, as they can be directly related to improved seeds.

Some interviewed workers in the research and extension system consider genuine participatory concertation with farmers in crop planning and varietal selection, including mixed cropping options, could optimise returns to effort and investment. Moreover, in Eastern Province especially some farmers who have been disappointed by crop failure or poor returns under CIP (especially in the lowlands) are only showing lip service to CIP advice of extensionists of the contracted Private Service Providers and returning part of their farms to traditional cropping including sorghum and climbing bean-maize combinations as aired in fieldwork discussions in Kirehe in October 2011 and witnessed on 03/12/2011 during the consultant team's last day's field programme organised by RAB; also photographed by the consultant team.

The credibility of CIP in some localities, notably in Eastern Province, may thus be under serious scrutiny by farmers who have decades of experience in spreading the cropping options and their associated risks. As advocated at several junctures in the study programme, more science and associated economic analysis should be promoted to provide the foundation of crop and variety selection and nutrient and IPM management for defined land systems, and to demonstrate that the utilisation of scarce soil resources have been optimised, including resilience to climate change. It would also appear that to enhance crop and variety selection under CIP, there remains plenty of scope to truly activate the spirit of SPTA2 SP2.3

for research for transforming agriculture[8]. Lately, in its EDPRS self-assessment, MINAGRI has considered that its CIP "*targeting was perhaps too output–based in the PSTA II implementation. Additionally, social impact did not have as a large relevance as economic growth priorities.*"

7.5 Trends

Utilisation of farm soils in many localities for CIP purposes may remain suboptimal due to possible suboptimal compatibility of the chosen variety with its environment and lack of optimum acidity and nutrient management.

Sections of the farming community may find cause to question CIP and revert to traditional cropping if crop yields are not kept at acceptable levels. It would not be unreasonable to expect such an attitude to take root when farmers are generally required to plant indicated crops and varieties (being a condition of access to subsidized inputs), rather than the farmer being able to make an informed choice in consultation with his/her extensionist or Contracted Service Provider on his/her best strategy. Without application of all critical inputs, crop yield increases may not reach 50% above 2007 yields cited in SPTA 2; maybe much less without proper acidity amelioration and fertility guidance.

The crop/meteorological insurance programme may continue to expand, albeit slowly, increasing the degree of adaptation to climate resilience and climate change. However, the expected decrease in the agro-biodiversity gene pool will reduce opportunities for climate change adaptation, just as will the increased reliance on single crop and variety.

Vulnerability to pests and diseases associated with mono-varietal planting may increase. Also the discouragement of inter-cropping will inhibit development of sustainable options for minimisation of fertiliser use (nitrogen fixation), + pest and disease management.

Most of the opportunity to apply the spirit of SPTA2 Sub-programme 2.3 for 'Research for transforming agriculture' will have been foregone.

7.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats that are taken into account for the formulation of an approach to this issue.

Table 4 SWOT analysis for Crop and variety selection

Strengths	**Weaknesses**
• CIP meets GoR output targets for scheduled staple crops • CIP reaps some economies of scale • National Biodiversity Strategy and Action Plan provides an agreed basis for the protection of agro-biodiversity	• Crop choice under CIP may not be financially and economically optimised; thereby limiting output potential of the scarce soil resource. • CIP lacks genuine participatory concertation with farmers in crop planning and varietal selection • Protection of agro-biodiversity is weak, and there is limited baseline information • Unwillingness to fully apply the spirit of SPTA2 Sub-programme 2.3 for 'Research for transforming agriculture' (for budget reasons?)
Opportunities	**Threats**
• Experience with FFS as potential to 'empower' farmers to make informed decisions on crop/variety selection and farming techniques, including consideration of adaptation to climate variability and climate change • Economically objective determination of soil yield potential for a range of staple crops based upon	• Utilisation of farm soils in many localities will remain suboptimal, due mainly to still limited coverage of soil acidity correction. • Farming community may come to question CIP if crop yields reach a low level without proper acidity amelioration and fertility guidance, especially in drought-prone areas where maize is being

soil nutrient/fertility intelligence • Selection of crops/varieties that are productive, less vulnerable to climatic hazards and resilient to pest and disease threats. • Fully activate SPTA2 Sub-programme 2.3 for 'Research for transforming agriculture' • Recently adopted NSCCLCD sets framework for better integration of climate change into CIP	promoted • Crop/meteorological insurance programme will not cover vulnerable farmers; they may continue to incur heavy periodic losses • Vulnerability to pests and diseases may increase due to, *inter alia*, selection of single varieties and/or reduced inter-cropping. • Rigid application of CIP will inhibit development of sustainable options for the minimisation of fertiliser use (nitrogen fixation), + pest and disease management • Mono-cropping will continue to pose a risk to agro-biodiversity with possible vulnerability to climatic (and other) shocks

7.7 Synthesis, proposed specific objectives and required results

The proposed Specific Objective to address this key issue is: *Crop selection by farmers is based on current intelligence for environmental compatibility, financial feasibility and risk.*

The following Results are proposed to achieve the Specific Objective:

Result 1: Cropping decisions of farmers are based on relevant and comprehensive information

Result 2: CIP is promoted in Districts where it is underwritten by crop/ meteorological insurance

7.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: Cropping decisions of farmers are based on relevant and comprehensive information							
1.1	Environmental compatibility of crops and their varieties for defined land units is determined on the basis of experience and guidelines written	RAB	-	RAB internal resources	-	National guidelines for 6 staple crops	National guidelines for all crops
1.2	Patterns of crop-weather interactions for defined land units and risk of meteorological variation and its crop effects are determined on the basis of experience and guidelines written	RAB	RMS; MINAGRI Meteorological Division	Internal resources of partners	-	National guidelines for 6 staple crops	National guidelines for all crops
1.3	Kinyarwanda manuals of crop/variety environmental compatibility and meteorological risk for all defined land units published and released	CICA	RAB	CICA	-	-	20,000 copies
1.4	Farmers are trained on crop/variety selection, including consideration of climate variability/change adaptation, so they may make informed choices	RAB Districts	AGRA	RAB internal resources			
Result 2: Crop/meterological insurance is expanded to all Districts where CIP is promoted							
2.1	Expansion of meteorological recording stations network	RMS	MINAGRI Meteorological Division	On-going programme of RMS	8 Districts	20 Districts	All Districts
2.2	Adoption (within SPTA3) of NSCCLCD indicator on '% coverage of early warning system'	MINAGRI	RMS	MINAGRI-RMS-MINIRENA Task Force	Indicator adopted		
2.3	Meteorological insurance gets underwritten in CIP areas	MINAGRI Meteorological Division	Banque Populaire and other Banks	Meteorological insurance underwritten in CIP targeted areas	8 CIP serviced Districts covered by meteorological insurance-	20 CIP serviced districts covered by meteorologic al insurance	30 CIP serviced Districts covered by meteorological insurance
2.3	Meteorological insurance extended to all	MINAGRI	Banque	Expansion of Banque Populaire	Aggregate	Aggregate	Aggregate

	farmers who can meet insurance terms and conditions	Meteorological Division	Populaire and other Banks	insurance insurance agency network	RWF value of insurance cover taken in adoption by CIP in insurance-serviced Districts	Value of insurance coverage is 300% of 2012 baseline	Value of insurance coverage is 1000% of 2012 baseline
2.4	Adoption of an indicator for the degree of uptake of weather insurance for CIP farmers (e.g. % farming HH under CIP with weather insurance)	MINAGRI			Indicator agreed	Indicator applied	100% of participating farmers

8 Technical issue 4: Pest and disease management

8.1 Introduction

This issue is aligned closely with SPTA2 SP1.5 for 'supply and use of agricultural inputs' and SP2.2 for 'restructuring proximity services to producers through the medium of cooperatives, enhanced extension and Farmer Field Schools (FFS)'. Moreover the NSCCLCD brings additional considerations where recommendations for MINAGRI include the Action 4 for Mainstreaming of "Push-Pull" Strategies (IPM) which embody sustainable pest management techniques incorporating a multiple cropping and fodder system designed to control plant parasites and pathogens such as stemborers and striga weed[1].

Pest and disease (P&D) management encompasses all aspects of crop and livestock protection, and protection of their stored products from damage or loss due to P&D invasion. In its respective laws and regulations, the GoR has chosen to ascribe to the word 'pesticide' the meaning of a product used for any of the foregoing purposes[2]. This report follows the same convention, but focuses principally on staple crop protection[3].

The exploration of this issue coincides with current initiatives of MINAGRI and RAB that aim for determining the economic utilization of pesticides in staple crops, and the development of safe trading, storage, handling and application systems that optimize the safety of users and minimize harmful impacts on the general environment (e.g. associated to run-off of fertilisers into the water systems)[4].

8.2 Policy and regulatory framework

The NCCLDCS Programme 1 (Sustainable Intensification of Agriculture) includes an action for prioritising the mainstreaming of IPM. This embodies sustainable pest management techniques incorporating a cropping system based on risk diversification by producing multiple crop and fodder yields and which necessarily, through crop and enterprise diversity and pest monitoring vigilance by the farmer, is also designed to keep incidence of plant parasites and pathogens below economic threshold levels without the need of pesticides.

Rwanda is a signatory of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides. The National Implementation Plan of the Stockholm Convention on Persistent Organic Pollutants (POPs), 2006, provides the expression of Rwanda's willingness to bring national corrective measures, and particularly elimination of storage and use of POPs, within the framework of Vision 2020. Pursuant to Organic Law nº 04/ 2005, Prime Minister's Order Nº26/03 (2008) determined the prohibited list of chemicals and other prohibited pollutants. Complementing this ban, the draft Organic Law of Agro-chemicals is now awaiting assent. It will encompass provisions for the manufacture, distribution, use, storage and disposal of agrochemicals including pesticides and fertilizers for the protection of public health and the environment, false practices in the supply of agrochemicals, injury avoidance during the application and use of agrochemicals, prevention of contamination of food with agrochemicals, protection of the agricultural community from deception and other related matters. It provides scope for designating use of personal protective equipment/clothing and establishment of Maximum Residue Limits (MRL) of chemicals in goods entering trade. It will need to be matched by an implementation and monitoring framework built around the scheduled responsibilities of the Registrar; such framework should preferably not be managed by MINAGRI (the implementation body) but by REMA..

8.3 Institutional framework

MINAGRI is responsible for mainstreaming IPM as already featured in SPTA2 SP2.2, but the responsibility and its urgency are now reinforced by the overarching demands of NSCCLCD. Within MINAGRI the Inspection and Certification Directorate in charge of plant health matters.

The Ministry responsible for monitoring impacts of chemical use is MINIRENA which delegates the tasks to REMA; RNRA is tasked to monitor chemical and turbidity water quality in water bodies.

Rwanda Bureau of Standards (RBS) also plays a role through providing chemical analytical services. At a pilot level NUR is also providing these services to World Bank funded projects.

Under Article 3 of the draft Agrochemicals Law, MINAGRI is charged with putting in place an Advisory Council to implement the Agrochemicals Law and also draft bylaws for agrochemicals registration and regulation. The draft Law provides for creation of the critical post of "Registrar of Agrochemicals who is the secretary of the Council"; this person will also be supported by a team of Inspectors fielded by MINAGRI. A (technical) committee will also be set up by the Council/Commission to advise the Registrar on any matter pertaining to pesticide registration and control. No agro-chemical may enter trade unless it has been registered and a certificate has been issued. Moreover the Law will provide for labelling and packaging in accordance with regulations made under the Law.

Under MINICOM, RBS is already an active player in supporting certification of food safety in manufacturing processes through its Environmental Analytical Chemistry Division and provides certification of chemical safety of crops and products exported by NAEB; it also has equivalent microbiological analytical capacity. By virtue of its chemical expertise it evidently has a role to play in the Advisory Council/Commission, possibly too in implementation until such time as a new laboratory has been set up by the Council to perform in this field. RBS has developed (2010-11) *Guidelines for quality and/or environmental management systems auditing* (suitable for use in the agrochemicals supply chain) and a *National Standard for General Requirements for the Competence of testing and calibration laboratories*, based on the ISO Standard ISO 17025.

The President's Office through RDB plays a leading role in the 'one-stop' environmental screening and certification of planned agro-industrial activity. This includes post-harvest processes and storage (which can include fumigation), as coordinated with MINICOM and MINAGRI's Post Harvest Handling and Storage Task Force. The Presidency is therefore an important institutional stakeholder in assuring post-harvest product safety/freedom from contamination.

8.4 Baseline

Biosecurity and Phytosanitary Capacity of Rwanda was assessed in 2007 (WTO-MSU) when GAP and HACCP approaches to management of Sanitary and Phytosanitary risks in the food chain were recommended; since that time Rwanda has not availed the EU-ACP Programme Initiatives Pesticides advisor facility that has been extensively used by Kenya Plant Health Inspectorate Service (KEPHIS). The Inspection and Certification Directorate of MINAGRI, which already has a collaborative relationship with KEPHIS, should follow up on this. Rwanda is a signatory member of the International Plant Protection Council (IPPC; focal point MINAGRI) (and OIE) and is accordingly committed to bio-security and pest and disease risk analysis/monitoring. IPPC is an advocate of IPM.

National performance indicators relevant to agro-chemical usage are set at different levels and in different sectoral strategies. They are found in Vision 2020; EDPRS; the CPAF; and SPTA2. SPTA2 SP1.5.4 measures '% of farms using pesticides' as a positive (but unquantified) input Indicator (which in EDPRS is quantified as 45% by 2012) without output or efficiency indicator; the same applies in SPTA 2 SP1.5.1 for fertilizer use. For the year ended June 2011 MINAGRI distributed 48,430 litres of pesticide (Pyrical) applied in coffee plantations against a target of 40,000 litres (MINAGRI internal annual review). MINAGRI has recognised that such indicators are in conflict with both its NSCCLCD-designated Action 1 for Mainstreaming of Agroecology (which demands mainstreaming of agroecology in agricultural intensification) and Action 4 for IPM. As in the case of fertilisers such indicators need to be replaced by crop response/benefit indicators that justify their use and track the quantities that had to be used when IPM approaches failed.

Consultations in the field have revealed that the list of permitted and prohibited chemicals is not widely propagated.

Chemicals are labelled with instructions in French and/or English; many operators read only Kinyarwanda, although this issue is covered under the draft law on agrochemicals. There are numerous aspects of P&D chemical management that are not compliant with requirements of MINECOFIN BCC Annex 17. Among these are risks (to operators, physical environment and consumers) not well known,

including heavy metals; pesticides dressed on produce immediately before harvest; and harmful interactions with beekeeping.

RBS (it attends to Mycotoxin detection and analysis in export products) suggested that pesticides require the same level of awareness raising media attention as fertilisers. Pesticides are more demanding in management/safety thresholds and need regulatory rigour as for pharmaceuticals: licencing of traders and technical training of sales staff. There is a question of whether training on pesticide management could match the intensive levels of training offered by MINAGRI and its partners in 2010-11 on fertilisers which was reported as follows: *30 Agro dealers, 895 retailers, 252 service providers technicians trained in fertilizer business and voucher system.*

At the national level there is no established system of Maximum Residue Limits for crop protection chemical in food and animal feed. There are two (RBS; NUR) laboratories of ISO 17025 Standard capable of residue detection and analysis but only the RBS facility is normally used for such purposes. SPTA 2 SP4.1.2 identifies the (KEPHIS-style?) plan for the Autonomous Rwanda Agricultural Sanitary and Phytosanitary Service (protocols for P&D monitoring and management) but the plan needs to be championed by the newly established Directorate of Certification and Inspectorate Services in MINAGRI. When duly certified proficient by RBS, this service could play a leading role in providing laboratory analytical services related to P&D management.

At the field operational level RAB Plant Protection/Pest & Disease R&D-Extension capacity is strongest mainly in N and S Zones where respective expertise is based; RAB plant pathologists and entomologists were trained in 2010 in P&D recognition and threshold limits (for treatment) by CABI International (Kenya); RAB Northern laboratory is well equipped (PCR; Elisa; microscopy) but requires a new work programme; also reagents.

IFDC was active in training farmers of INGABO syndicate in safe handling of agrochemicals (programme ended). However RAB Extension includes new establishment of eight Mobile Plant Clinics (at major agricultural markets) to assist farmer P&D recognition and farmer feedback; safe handling of chemicals could become part of the mobile training system.

Protocols for P&D control measures to address common P&D are being developed by RAB. The menu of options remains limited and much of RAB focus is on problem solving. The Farmer Field School (FFS) training module developed for Integrated Pest and Disease (P&D) Management (IPM) by MINAGRI-BTC is ready for wide replication in accordance with the aims of SPTA 2 SP1.5.5, *which seeks 40% uptake by 2012,* and with its specific requirement enumerated in MINECOFIN BCC Annex 17. But P&D risk analysis/field scouting for threshold infections is not yet institutionalised to Districts and Sectors. Several RAB research scientists and extension coordinators have advocated that the FFS programme take a broader approach, by including IPM in Integrated Crop Management (ICM), which covers all aspects of management of the farm environment[5].

8.5 Trends

On current information from MINAGRI the Law on Agro-chemicals will shortly be enacted but the Autonomous Rwanda Agricultural Sanitary and Phytosanitary Service may remain a lower priority project unless actively pursued by newly established Directorate of certification and inspectorate services in MINAGRI . This possible hiatus could seriously retard the design and implementation of a system of Maximum Residue Limits for staple crop protection chemicals in food and animal feed; although much inspiration in this regard can be drawn from the beverage and horticultural export sub-sectors.

There is no reason to doubt that the list of permitted and prohibited chemicals will be propagated, especially by RAB. Full functionality of the agro-chemicals Advisory Council and its subsidiary organs will be required to address the challenges of a lack of registration of traders, of chemicals remaining unlabelled in Kinyarwanda and to generally achieve progress towards compliance with MINECOFIN BCC Annex 17. It should also be borne in mind that the Climate Change and International Obligations Unit (CCIOU) of REMA has responsibility to verify and ensure that Rwanda continues to comply with its international obligations on prohibited chemicals.

Rwanda remains vulnerable to cross-border transmission of plant and animal pests and diseases from neighbouring States but stakeholders did not consider this a major threat.

Indigenous pest and disease outbreaks will continue to occur and may accelerate and intensify under extensive mono-cropping, mono-varietal systems.

The FFS training module for IPM/ICM is unlikely to accelerate its operations to meet the SPTA2 target of 40% uptake by 2012 and may not become widely replicated unless additional resources are given. Moreover the associated practice of P&D risk analysis/field scouting for threshold infections may not be institutionalised to Districts and Sectors without additional resources being provided.

RAB Northern laboratory resources are likely to remain not fully utilized until such time as a definitive work programme and rehabilitation budget are adopted for them (not seen by the consultant team); expanded RAB Extension with Mobile Plant Clinics (at major agricultural markets) is taking place. Protocols for P&D control measures to address common P&D are being slowly developed by RAB but RAB P&D effort mostly remains focused on problem solving.

8.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats associated to this technical issue.

Table 5 SWOT analysis for Pest and Disease Management

Strengths	**Weaknesses**
• IPM methods and associated FFS training approaches have been developed by MINAGRI and are ready for accelerated roll-out • Integrated Pest and Disease (P&D) Management (IPM) ready to be promoted within a broader ICM package embracing aspects including plant nutrition and optimisation of the farming system • The potential for an effective overarching regulatory and implementation framework for pesticides exists and will be enacted shortly • Very high awareness across all interest sectors (MINAGRI; MINIRENA and subsidiary agencies) and at RBS to risks of current unmonitored chemical distribution and handling systems • Recognition by observation that use of pesticides in horticulture – sometimes at high frequency - can transform returns to effort of farmers, especially farmers of upland potatoes	• The current regulatory framework lacks operator licensing • Underutilisation of past national and regional project research results (e.g. CATALIST) • The environmental, consumer and user impacts of pesticides use at high frequency by some horticultural farmers have not been quantified • There is underutilisation of RAB research and laboratory resources • Environmental + economic options/thresholds for various pesticide use not yet determined • RAB research plots remain mostly localised and their results may only have local relevance
Opportunities	**Threats**
• RAB focus transformed to risk assessment with support of Inspection and Certification Directorate • FFS training in IPM expanded within a broader ICM programme and adopted countrywide • P&D risk analysis/field scouting for threshold infections, and application of 'roguing'/burning of infected plants, institutionalised in all Districts and Sectors • Training of all actors in safe handling and use • RAB Northern laboratory fully utilised	• Indicator on intensity of pesticide use not conducive to rational utilisation • Lack of detection of environmental contamination • Lack of quantification of contamination • Medium- and long-term effects upon human health: operators, water users, product consumers derived from pesticide use • Other development objectives taking priority • Lack of decision and/or resources for creation/designation of a suitable analytical

• RAB Extension Mobile Plant Clinics effectively assist farmer P&D recognition + farmer feedback • Protocols for economic P&D control measures to address common P&D developed by RAB • Appointment of informed technocrats to the panel of the Agrochemicals Advisory Council and establishment of an effective permanent Registration and Inspection capacity • The Inspection and Certification Directorate in charge of SPS will be in a position to play a central role • By its own admission (EDPRS self-assessment review/draft) "MINAGRI has learnt from weak linkages to specific ministries…. e.g. Ministry of Health, so that environmental concerns could be better coordinated and mainstreamed."(uptake of pesticide residues by humans) • Activate planning for establishment of the Autonomous Rwanda Agricultural Sanitary and Phytosanitary Service	chemistry laboratory

8.7 Synthesis, proposed specific objectives and required results

The synthesis for this issue is built largely around the:

NSCCLCD requirement for Mainstreaming of IPM; belief that the nascent FFS Programme of RAB will be more widely applied; promise of the new Organic Law of Agro-chemicals taking effect; assumption that MINAGRI and RAB will be actively supported in their implementation by RBS and MOH (monitoring); and, anticipation of full water quality monitoring aspects of IWRMP of RNRA being effective.

The proposed Specific Objectives to address this key issue are:

SO1: Integrated crop management (ICM) extension methods are mainstreamed for farming systems optimisation

SO2: Necessary use of permitted agro-chemicals in integrated staple crop management is optimised for safety and efficiency in compliance with multi-lateral environmental agreements

The following Results are proposed to achieve the Specific Objectives:

SO1: Integrated crop management (ICM) extension methods are mainstreamed for farming systems optimisation

Result 1: IPM and Pest Risk Analysis (PRA) protocols and associated roguing practices developed for all major crops

Result 2: Kinyarwanda manuals for IPM and Pest Risk Analysis (PRA)/roguing of all major crops distributed to extension workers and farmers

Result 3: Farmer Field Schools (FFS) for ICM conducted

SO2: Necessary use of permitted agro-chemicals in integrated staple crop management is optimised for safety and efficiency in compliance with multi-lateral environmental agreements

Result 1: Regular publication of approved and banned agro-chemicals completed, based on international norms

Result 2: Authorised distributors periodically licenced and certified

Result 3: All agro-chemical products are plastic-tagged with Kinyarwanda instructions

Result 4: Efficacy and efficiency results of P&D trials in CIP staple and other crops documented

Result 5: Crop-specific protocols for farmer adoption of specific pesticides are released in Kinyarwanda

Result 6: P&D certification of public and private extension staff completed

Result 7: Verification that the production systems (i.e. distributors; on-farm practices) are chemically safe

Result 8: Pesticide leachate content of groundwater and water bodies reported

8.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
SO1: Integrated crop management (ICM) extension methods are mainstreamed for farming systems optimisation							
Result 1: IPM and Pest Risk Analysis (PRA) protocols and associated roguing practices developed for all major crops							
1.1	Development of IPM/Pest Risk Analysis (PRA) protocols, field scouting frequencies and roguing practices completed for all major crops	RAB	BTC;External provider:KEPHIS Kenya &/or CABI	RAB exchange visits to Kenya; external consultant support in Rwanda	10 crops	All crops	-
Result 2: English, French and Kinyarwanda manuals for IPM and Pest Risk Analysis (PRA)/roguing of all major crops distributed to extension workers and farmers							
2.1	Manuals developed for IPM/PRA and associated practices of all major crops	RAB	-	RAB P&D research and extension teams	10 manuals	20 manuals	All manuals
2.2	Manuals published: 20,000 copies	RAB	CICA	CICA with funding of printing and distribution costs	-	-	Publication +distribution
Result 3: Farmer Field Schools (FFS) for ICM conducted							
3.1	FFS training programmes incorporate modules and Kinyarwanda extension materials for: IPM/PRA and associated practices of all major crops; Soil and Water Conservation (see TI1); Acidity and Nutrient Management (see TI2); Crop and Variety Selection (see TI3); crop-specific protocols for use of specific pesticides (see SO2)	RAB	Private service providers; District Agronomists	RAB extension teams supported by Private service providers and District Agronomists	100/year (pilots)	500/year (pre-testing)	3,000/year
SO2: Necessary use of permitted agro-chemicals in integrated staple crop management is optimised for safety and efficiency in compliance with multi-lateral environmental agreements							
Result 1: Regular publication of approved and banned agro-chemicals completed, based on international norms							
1.1	Review conducted and lists published in the Official Gazette	MINAGRI	RBS	Registrar of agro-chemicals and team	Annual lists published	Annual lists published	Annual lists published
Result 2: Authorised distributors periodically licenced and certified							
2.1	Environmental screening of distributors, personnel, premises and handling systems conducted and approved list published in the Official Gazette	MINAGRI	RBS	Registrar and MINAGRI Inspectors with powers of inspection and enforcement	none	Biennial list published	None

Result 3: All agro-chemical products are plastic-tagged with Kinyarwanda instructions							
3.1	Review of manufacturers' instructions suitability for local conditions and translation	MINAGRI	RBS	Registrar of agro-chemicals and team, according to manufacturers' published recommendations (as adapted to local conditions from Result 4).	Progress report only	All products	All products
3.2	Setting of specifications of plastic tags	RBS	-	RBS materials division	Completed	-	-
3.3	Purchase and printing and use of plastic tags by national dealers	Dealers to RBS specs.	-	Inspection: RBS materials division	10 products	30 products	All products
Result 4: Efficacy and efficiency results of P&D trials in CIP staple and other crops documented							
4.1	Results of previous work (CATALIST, etc) documented – including associated residue analysis in food and feed products, soil and water	RAB	-	RAB P&D research team	20 recommendations documented	All recommendations documented	-
4.2	Results of new research on trial P&D measures in CIP staple and other crops documented – including associated residue analysis in food and feed products, soil and water	RAB	-	RAB P&D research team	none	5 trial results documented	15 trial results documented
4.3	Methods of residue analysis in products, soil and water appraised for rigour	RBS	RNRA	RBS and RNRA analytical chemists	none	As above	As above
Result 5: Crop-specific protocols/manuals for farmer adoption of specific pesticides are released in Kinyarwanda							
5.1	Manuals developed for safe dosages, frequency, handling systems, disposal; economic application measures, equipping/protective clothing; pre-harvest intervals; risks.	RAB	-	RAB P&D research and extension teams	10 manuals	20 manuals	All manuals
5.2	Manuals published and released	CICA	RAB	CICA		10 manuals X 10,000 copies	20 manuals X 10,000 copies
Result 6: P&D certification of public and private extension staff completed							
6.1	Training (ToT) of public and private (service provider) extension staff (Sector and District) completed	RAB	-	RAB extension teams	30/year	200/year	200/year (refresher)
6.2	Respective (pesticide use) certification of public and private (service provider) completed	RAB	RBS	RBS individual test verification of knowledge acquired RAB HQ		200/year	200/year

Result 7: Verification that the production systems are chemically safe							
7.1	Spot checking, detection and quantification of residues throughout the food chain	RAB	RBS	RAB extension teams supported by RBS laboratory analysis	50/year	100/year	150/year
7.2	Spot checking, detection and quantification of residues in user blood samples	MOH	-	Sub-District Health Centres and MOH Central Analytical Laboratory &/or RBS	150/year	150/year	150/year
Result 8: Pesticide leachate/content of groundwater and water bodies reported							
8.1	IWRMP of RNRA incorporates regular monitoring of groundwater and water bodies for pesticide leachate/ contamination	RNRA	RBS with possible support from NUR Districts	RNRA with support of District Environmental Officers for sample collection; RBS	none	30% boreholes + major rivers, lakes and reservoirs, annually	All boreholes and major rivers, lakes and reservoirs, annually

9 Technical issue 5: Rural feeder roads

9.1 Introduction

Initially the principal determinant of this Issue being presented was compliance with the ToR related to assessing and providing results-oriented recommendations on:

- the likely significant effects on the environment to be taken into account in the formulation of the Rural Feeder Roads (RFR) SPSP to be supported by the EU;
- the degree to which the planned SPSP would address the major environmental sustainability challenges;
- how potential negative environmental effects could be minimized and positive effects might be optimized;
- the regulatory framework, and
- the adequacy of institutional structures and capacities.

This paper accordingly examines the draft proposals of the RFR SPSP Formulation Team which is due to submit its final recommendations in January 2012. It is based on the documentation offered by the Formulation Team[1] and on the SEA team's further investigations of information and analysis related to the subject matter. In this way steps have been taken towards satisfying the basic requirement set forth in the EU Identification Fiche for RFR SPSP, i.e. *Environmental risks will be covered by the Strategic Environmental Assessment to be undertaken, which shall identify specific risks and ensure appropriate mitigation measures...* Importantly too, *when it comes to options for harmonisation with other donor interventions, the EU intends to initiate and coordinate a joint monitoring, to be carried out with GoR and the other Development Partners active in the domain of rural roads (currently Netherlands, USAID and WB) of the implementation of this SPSP and other programmes in place; with the aim of a performance assessment under an integrated approach (possibly implying a Memorandum of Understanding specific for this domain).* There is therefore the possibility that other RFR Development Partners will wish to consider adoption of the same environmental monitoring framework as applied by the EU.

At the overall sector level the SEA has revealed that this Issue influences the effectiveness of several environmentally beneficial activities suggested to address other technical (T) issues. RFR are vital conduits for efficient delivery of farm inputs including limestone and inorganic fertilisers (T2) and seeds (T3), and enhance farming community consolidation of production and provide access to markets[2]. They can facilitate the efficiency of time use by extension services (S4; T4) by monitoring/inspection bodies (S1; S3; S4 & T2; T3; T4) and by community work parties engaged in regular environmental improvement activities such as in *Umuganda* initiatives for land and water conservation (T1).

It has been concluded therefore that in relation to implementation of other issues identified, this report would be incomplete without drawing attention to the important role that the RFR sub-sector can play in optimising resource use and contributing to acceleration of the desired improvements and positive outcomes projected in the Strategic Logframes for the other issues.

9.2 Policy and regulatory framework

Key national policies are Vision 2020, SPTA2 and the EDPRS in which the transformation of agriculture is a key pillar for development, with the current focus on increase of productivity. The National Decentralisation Policy delegates to Districts a number of responsibilities in this sector; these include procurement for District roads. Other relevant policies and strategies include the National Post Harvest Staple Crop Strategy (PHSCS), which advocates improvement of the RFR network. The National Transport Policy (2008) integrated RFR into the overall Policy and advocated a global budget of RWF2 bn (some 2.5M€) for RFR annually from 2009 up to 2012-13. The draft National Road Law (version September 2011) Article 28 heeds the need to manage natural water run-off with great care and Article 30 draws attention to the need for 45% maximum slope to (rocky) embankments but generally does not address RFR.

Other policies which support the implementation processes are: the Community Development Policy; National Gender Policy; Environmental Impact Assessment Guidelines; and National Labour-Intensive Public Works (HIMO) Strategy. Policies and regulations are more fully reflected in the RFR Formulation documentation.

The NSCCLCD observes that the terrain and climate of Rwanda are characterised by hills and intense bursts of precipitation. Under its Programme 9, Action 3 'Investment in Infrastructure' it draws attention to the quality of transport infrastructure not only affecting the efficiency of the transport system, but also its resilience to climatic impacts, i.e. improved infrastructure, such as road surface, both increases ***efficiency*** and improves ***resilience*** to climatic events.

9.3 Institutional framework

Among the main institutions concerned with this issue is MINAGRI as the owner of the PHSCS Policy. Progress of the planning of this programme is regularly monitored in the AJSR; MINAGRI also participates in the Transport Sector Working Group. RTDA shall support the organisation of the Programme Steering Committee (PSC) and plans to send representation through its (currently small: 4 officers) District Support Unit (DSU) to support Programme Monitoring and guide the District agricultural officers in identification and implementation of feeder roads. The full institutional matrix is examined and analysed in detail in the RFR SPSP formulation documentation. This needs to include REMA for all environmental regulatory and monitoring issues and which should also sit in the RFR SPSP Steering Committee[3].

Effectiveness of REMA is addressed under Issue S3. For the purposes of RFR it can be demonstrated that, when fully applied by REMA and its cell within RDB, EIA and associated mitigation measures in the RFR feasibility and design stage, and implementation of the developer's associated EMP for monitoring and maintenance, can be effective to assure minimum negative environmental impacts.

At local government level the Ngororero District has established the precedent of devoting recurrent budget resources to the creation of the new post (2011) of Infrastructure and Land Officer in all Sectors, due to the identification of the inability of Sector Agronomists to effectively cope with their Agro-environment responsibilities alongside the multiple tasks inherent to settlement of land adjudication/ titling questions and to civil works of both buildings and rural roads; the conflict of technical loyalties of Agronomists in other Sectors is discussed under Issue S4.

9.4 Baseline

The RFR network extends to some 29,000km (as per USAID note). A World Bank 2010 Rwanda Infrastructure Assessment Report stated that all RFR were in poor condition and in need of repair and/or upgrading. In the context of SPTA2 and the PHSCS, improved road quality can directly lead to reduced vehicle wear and tear and lower transport costs. The target under PHSCS 5-year Action Plan (March, 2011) is of no less than some 80km of feeder roads improved per year. Under SPTA2 (SP3.5.7 for Market-oriented rural infrastructure) there is a target of 1,000km of rural access roads to priority production areas created by 2012.

The main example of rural feeder road design and implementation is the longstanding partnership between HelpAge and The Netherlands. This is discussed in the RFR SPSP Formulation documentation.

The RFR formulation documents explain how for the first phase of SPSP, EU assistance will target seven Districts[4], whilst Netherlands (5; on-going), USAID (8 to 12; started), IFAD (1; on-going) and World Bank (2; new) will support RFR in the other (20) rural Districts. With a strong in-house engineering team in Kigali, the EU explicitly expressed the wish to coordinate the donors' system of monitoring of implementation; this would necessarily include environmental monitoring.

Poor RFR design and implementation can have harmful environmental impacts, especially in hilly terrain of the type encountered in EU target Districts, Ngororero (all), Northern Rulindo and Western Muhanga where typically high rainfall (>1,200 mm/yr) on steeply sloping land pre-disposes the natural environment to high run-off, floods, risk of significant soil erosion and sedimentation downstream, undermining productivity of lowland farming lands and disturbing the ecology of wetlands. In Ngoma and Bugesera in the East (two other EU target districts) the potential for negative environmental impacts attributable to rainfall (<1,100 mm/yr) and speed of run-off is much lower.

The RFR SPSP preliminary Formulation proposals have been reviewed by the SEA team and provisional recommendations have been offered. Existence of environmentally compliant standards and specifications could

be pre-requisites to one or several SPSP disbursements in the corresponding Financing Agreement.

As previously asserted, prevailing weather patterns affect integrity of the feeder roads network through intense rainfall events and flooding, which may be exacerbated by climate change. Rwanda has not yet adopted standards for the construction of feeder roads. MININFRA and RTDA are expected to establish climate-proofed specifications for RFR as a by-product of the implementation of the USAID project (linked especially to PHSCS opportunities) in the sector.

The consideration of environmental maintenance along the length of paved roads by the National Roads Strategy includes routine maintenance on a continuous basis, including tasks of grass cutting and vegetation control. This is not accompanied by a statement for vegetation maintenance or improvement, although there is physical evidence along numerous public highways that embankment vegetation is promoted and planted. But, this unregulated situation does not provide a satisfactory basis for roadside environmental management and monitoring on feeder roads.

Currently the principal instrument for ensuring that environmental safeguards are integrated into road construction and maintenance is the EIA system, but it has been largely ineffective (in terms of EMP implementation and enforcement). This can be rectified by measures described under issue S3.

9.5 Trends

It is likely that the RFR standards and specifications adopted by MININFRA, and RTDA in particular, will be based on the experience gained in initial implementation of the USAID-supported programme in 8 to 12 Districts.

The arrival of not only the EU but also other development partners to support RFR suggests that - with the requisite increase of Sector absorption capacity (infrastructure planning and coordination) - SPTA2 target for 1,000km of rural access roads to priority production areas may be surpassed over the next four years even if the 2012 target may not be met on time.

The means of deciding on prioritization of RFR rehabilitation have yet to be worked out; for the time being it will depend heavily on existing District Development Plans – but the current plans will lapse in 2012 when new DDPs will be written and offer utilization of a new matrix of criteria as the foundation for decisions on RFR development[5].

Under issue T2, this report identifies the importance of rural roads for the supply and delivery of vital fertility management inputs, especially limestone which is a much bulkier material than inorganic fertilisers yet of similar density. In acidic soil zones, roughly one tonne of limestone is needed to match 0.1t of fertilizer therefore, in terms of handling complexity and physical effort, proximal delivery of this material to farms is more critical than fertiliser delivery.

The implementation strategy advocated by the SPSP Formulation encompasses the following general considerations: (i) priority would be given to full rehabilitation and spot improvement of existing feeder roads, without extension of carriageway width beyond 4m, instead of new construction; (ii) favouring labour-based methods (LBM) including opportunities for female participation and female management; additionally combining use of labour and light machinery - wherever technically and economically feasible; (iii) rehabilitated and improved feeder roads to reach the standard of all-weather road; (iv) attention given to capacity building of specialised contractors using LBM - both through refresher technical training for existing ones and training of new contractors (v) rehabilitation works subject to agreements reached with District councils and concerned ward/communities with regards to the selection, organization and oversight; (vi) provision made to finance regular mechanized maintenance works (spot improvement) 2-3 years after rehabilitation works are completed.

The strategy is to be accompanied by proposals for technical assistance over a period of 3.5 years to assist implementation. This will include deployment of project officers in all supported Districts to fulfil the new post of District Feeder Roads Engineer who may, upon appraisal before the project closes, be adopted into the regular District establishment.

9.6 SWOT analysis

This analysis takes two forms. It identifies further provisions that require to be incorporated in RFR SPSP documentation to satisfy environmental requirements and then presents a table of the general context of SPTA2 implementation and relevance to other Key Issues.[6]

The general SWOT analysis in the broader context of SPTA2 implementation and relevance to other identified Key Issues is presented below, synthesising the strengths, weaknesses, opportunities and threats that should be taken into account especially by MINAGRI for RFR development and maintenance.

Table 6 SWOT Analysis of Rural Feeder Roads (RFR)

Strengths	**Weaknesses**
• The Sector level Agronomist and IDP at cell level offer some planning and implementation support to RFR development in their areas of work • Umuganda offers an effective system of RFR regular maintenance in some Districts and/or Sectors • TIG has contributed significantly to road rehabilitation and maintenance	• No adopted standards for RFR construction (including environmental standards for vegetative protection of verges, water courses, embankments and cuttings) inhibit planning and budgeting for RFR development • Large ranges of topography, soil structure and rainfall patterns across Rwanda lead to complexities in determining suitable standards and specifications for specific locations; one size will not fit all • Low capacity at sector and cell levels (for RFR implementation, maintenance and monitoring); an additional staff member in charge of land and infrastructure is required (and release the agronomist for the breadth of duties related to ICM - see T4) • Lack of prioritisation of District funding for RFR maintenance, moreover diminishing TIG resources require to be succeeded by sustainable budgeted maintenance systems • Lack of analysis to reveal the true economic costs of inefficiencies attributable to RFR deterioration and neglect
Opportunities	**Threats**
• New DDPs to be prepared in 2012 and offer a new matrix of criteria as the foundation for decisions on RFR development • Development of CIP increases commercial utilisation of RFR and strengthens the economic case for their rehabilitation • Supervising engineers and contractors to incorporate environmental standards into their codes of practice and management systems • Road design standards can be reinforced to cope with increased rainfall/surface water surges • Staffing establishment at Sector level to be expanded to cope with the surge of donor support to the RFR sector – possibly through budget earmarking; this staff can harness learning by doing in partnership with the Technical Assistance offered • Robust all-weather roads enable maximised	• Climate change expected to affect integrity of rural roads network • EMPs are not adequately implemented • Delays in RFR rehabilitation have knock-on effects on sub-optimal use of farm and extension resources: input supply and fertility management; mobility and time efficiency of extension workers; ability of RAB/extension to access trouble spots of pests and diseases

economies of transport of farm outputs and inputs and minimised time lost to travel by extension services • Experience of HelpAge and other RFR developers can inform optimisation of road design and budgeting (as explained in the RFR SPSP formulation documents) • Experience in nearby countries can shed light on best approaches to RFR design and mitigation of harmful environmental impacts	

9.7 Synthesis, proposed specific objectives and required results

The synthesis for this Issue assumes that all recommendations offered for environmental integration into RFR SPSP Formulation for EU support (see Endnote 6) will be: (a) incorporated into the respective SPSP planning and conditionality matrix; (b) matched by necessary commitments and implementation of the full EIA/EMP system advocated under the Strategic Logframe for Issue S3; and (c) not be materially undermined by deviant approaches to RFR rehabilitation and maintenance support by other Development Partners active in the sector.

The synthesis otherwise concentrates on the aspects of the issue identified in the Baseline, Trends and especially the SWOT analysis that still require to be addressed.

The proposed Specific Objective to address this key issue is: *Durable rural feeder road development and maintenance sustain integrated practices that optimise land utilisation*

The following Results are proposed to achieve the Specific Objective:

Result 1: Region-specific climate-proofed feeder road standards and specifications adopted in conformity with good environmental and engineering practice

Result 2: Human resources (HR) at Sector level strengthened to avert dilution of agro-environmental HR and improve dedicated absorption capacity for donor support to RFR

Result 3: The basis of feeder road development prioritisation includes integrated land husbandry criteria as well as market-related criteria

9.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: Region-specific climate-proofed feeder road standards and specifications adopted in conformity with good environmental and engineering practice							
1.1	Lessons/experience from RFR design and climate-proofing/durability within the different geo-climatic environments of Rwanda and from elsewhere (Ethiopia, etc.) are analysed and documented, incl. measures for vegetative protection	RTDA	Consultants/Technical Assistance (TA)	RTDA internal resources	Complete report submitted	-	-
1.2	Manual of RFR good environmental and engineering practice developed and published	RTDA	MININFRA	RTDA internal resources with budget earmarking	-	Manual published (incl online)	
1.3	District Engineers and Environment Officers, Contractors and Supervising Engineers trained in RFR good environmental practices	RTDA	Consultants/TA; RNRA	RTDA internal resources with budget earmarking and support from RNRA		5 Districts (pilot)	All Districts
Result 2: Human resources (HR) at Sector level strengthened to avert dilution of agro-environmental HR and improve dedicated absorption capacity for donor support to RFR							
2.1	Job description written for new post of Infrastructure and Land Officer based on experience in Ngororero	RTDA	RNRA (land) Ngororero District	RTDA internal resources	Completed		
2.2	416 Sector Infrastructure and Land Officers recruited and trained in RFR good environmental practices	Districts	RNRA (land) Consultants/TA; RNRA (environment)	Districts and RTDA internal resources with budget earmarking and support from RNRA	-	100 recruited and trained	Balance (316) recruited and trained
Result 3: The basis of feeder road development prioritisation includes integrated land husbandry criteria as well as market-related criteria							
3.1	Guidelines to District Development Committees (or relevant equivalent committee as established under the new Local Government Law) for criteria and their scoring are developed with an ICM orientation to support feeder roads prioritisation	MINAGRI	RTDA	MINECOFIN - MINAGRI – RTDA – REMA – RNRA - MINIRENA Task Force	Completed	Adopted by all DDCs; 25% applied	100% applied

10 Systemic issue 1: Monitoring and evaluation

10.1 Introduction

M&E systems are established to track the extent to which desired objectives and their results are achieved, and to report the timing and effectiveness of implementing associated activities, and the amounts and effectiveness of implementation. Based on results the need for corrective actions can be identified. For this reason it is important that indicators provide an objective indication of progress for key variables of concern. MINAGRI is working on the development of its internal M&E system in conformity with CAADP.

However for M&E to be effective it is also necessary that reporting mechanisms ensure effective communication of results across all interested levels and institutions and that the different M&E systems addressing environmental aspects of agriculture are harmonised. This is where the M&E system for the agriculture system requires strengthening. Aspects related to specific indicators are addressed under the relevant technical issues; this section focuses on the set-up and management of the M&E system itself.

10.2 Policy and regulatory framework

The main M&E frameworks with agro-environmental content are derived from policy and strategy documents. At national level these are Vision 2020 and EDPRS, whereas at the sector level these are SPTA2 and ENRSSP. More recently indicators from the NSCCLCD have been defined and are also relevant due to their implications for the agriculture sector.

10.3 Institutional framework

The main institutions for responsibilities in the agriculture M&E system are: MINAGRI as Chair of the ASWG and monitoring of overall progress in the agriculture sector; local Governments, responsible for monitoring at the local level and reporting to MINALOC. MINIRENA is Chair of the ENR SWG and thus responsible for monitoring and reporting on progress in the ENR sector, which includes some agriculture-related indicators.

10.4 Baseline

Performance indicators relevant to the environment-agriculture inter-linkages are set at different levels and in different sectoral strategies. We can find these in: Vision 2020; EDPRS; the CPAF; SPTA2; the ENRSSP; the MTEF and Imihigo/Performance Contracts.

Environmental authorities (e.g. MINIRENA) have established environmental indicators relevant to the agriculture sector and, through existing mechanisms for inter-institutional coordination (such as the SWGs and the IDP), they try to ensure that these objectives and indicators are up-taken at the sectoral level (MINAGRI). Also MINIRENA has contributed environmental mainstreaming objectives for the agriculture sector, and which now form part of the BCC guidelines for the preparation of budgets. Local authorities also include environment-agriculture indicators as part of their PCs. A synthesis of the main environmental-agriculture indicators is provided in Annex A2b.

The most elaborate environment-agriculture indicators are found in the SPTA2 log-frame (some of which are reflected in the EDPRS and CPAF). The ASWG produces two reports per year, which are considered to be the key monitoring of performance in the sector. In a similar fashion, the ENR SWG produces two reports per year reporting on progress in the ENR sector, with special emphasis on EDPRS and CPAF indicators.

Although stated indicators under the various policy and strategy documents address most key variables of interest[1], many of these indicators are not being applied and key focus is on CPAF and AJSR indicators and which are mainly concerned with soil erosion control, use of fertilisers, area of marshland developed and intensity of extensionist services. Also, in spite of various M&E frameworks addressing similar issues, the corresponding indicators are not always consistent, with smaller or larger variations in their

formulation. This situation leads to potential confusion, especially as mechanisms for data collection and treatment are usually not specified (except for some CPAF indicators).

Local governments play a key part in M&E, as they are in charge of implementation of agriculture activities and their monitoring. The M&E reporting flows are as follows:

- Districts, Sectors and Cells have established Performance Contracts (under Imihigo); performance at District level being directly reported to the President's Office.
- Districts report monitoring results to MINALOC, in the form of District Imihigo/Performance Reports.
- MINAGRI prepares Annual Sector Performance Reports for MINECOFIN and the sector's stakeholders giving special emphasis on the progress achieved towards EDPRS/CPAF indicators.
- MINIRENA, through the ENR SWG reports to MINECOFIN, especially on CPAF indicators.

As far as Performance Contracts are concerned, Districts are to choose indicators from those offered by line ministries; however in practice many select indicators which are not in the list, and thus not closely linked to earmarked spending allocations[2]. This adds to the harmonisation gap.

There is no integrated system that collates the performance on SPTA2, and there are significant gaps in monitoring SPTA2 implementation[3]. SPTA2 includes a large list of indicators, but with no reference as to how these will be monitored and reported. There is interest in establishing a Management Information System (MIS) in MINAGRI, but this is yet to be implemented[4].

The reporting mechanisms and platforms do not favour effectiveness; without a common platform for the different institutions, these cannot have easy access to what others are reporting. For example, monitoring information generated at local level for MINALOC and MINECOFIN use is not easily accessible to MINAGRI; there is no formal read-access link of technical and financial reporting from local level to MINAGRI, nor access of MINAGRI to databases of other Ministries. Also at the local level, reporting is often done based on hand-written reports due to lack of access to computers and/or Internet connections.

10.5 Trends

The M&E system is expected to improve with respect to some individual indicators, which are already receiving attention, and which are referred to in the corresponding sections on technical issues. Otherwise no short-term changes are expected in monitoring system for SPTA2 nor for reporting mechanisms and platforms.

10.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats associated to this systemic issue.

Table 7 SWOT analysis for the M&E system

Strengths	Weaknesses
• Good coordination in the framework of the ASWG and the[5] ENR SWG • Overall good consistency between key M&E frameworks for key variables (Vision 2020 – EDPRS – SPTA2 – ENRSSP – Imihigo) • Regular production of AJSR and ENR JSR reports • Annual National Dialogue chaired by His Excellency the President	• Absence of a definition of mechanisms for monitoring and reporting of SPTA2 indicators • Limited access by MINAGRI to technical and financial monitoring data at the local level gathered by other Ministries • Need for MINAGRI to perform physical ground-truthing/spot checks for 'ear-marked' implementation at District level • Limited capacities for monitoring at the local level (dedicated personnel)

	• Lack of common ICT platform • District and sector level limited access to paper-less communication, computers and Internet
Opportunities • Awareness of weaknesses and limitations of M&E system by MINAGRI and on-going commitment (CAADP framework) to enhance the system • Increased donor funds to the agriculture sector can allow improvement of M&E system (e.g. the development of a functional MIS) • Rwanda Environmental Information Network (REIN) (REMA-coordinated) can help inter-institutional coordination (central level) • Up-coming preparation of SPTA3 will allow to improve sector M&E system • Integration of MINAGRI budget earmarking expenditure tracking into MINECOFIN-Districts ICT platform • SBS 'value for money' reporting requirements of donors can be addressed in EDPRS2 and SPTA3 • Village-Cell-Sector-District performance contracts offer a structure for improved monitoring (technical and financial)	**Threats** • Harmonisation of indicators difficult to take up to the Vision 2020 level, as no revision of the document foreseen • Variations in the definition of indicators in different M&E systems (lack of harmonisation)

10.7 Synthesis, proposed specific objectives and required results

The shortcomings of the M&E system are basically centred around: access to monitoring data by all concerned institutions; reporting mechanisms to ensure broad access to results; capacities for monitoring at the local level especially; absence of a proper M&E system for SPTA2, including monitoring and reporting mechanisms; and incomplete harmonisation of indicators across the main M&E systems.

Addressing these aspects will require solutions of a technological nature (e.g. purchase of sampling/analytical equipment); of a strategic planning nature (e.g. defining a proper M&E system for SPTA3); of capacity-building; and, very importantly, a very good inter-institutional coordination as relevant indicators are under responsibility of different authorities and levels of government (e.g. monitoring of water quality is under responsibility of RNRA, but is necessary in order to understand impacts from fertiliser and pesticide use, as well as to corroborate effectiveness of soil erosion control measures).

NB: aspects on specific indicators are addressed under the corresponding Technical Issues.

The proposed Specific Objective to address this key issue is: *the different M&E (including regular and periodical reporting and communication of data) frameworks relevant to the environmental aspects of agriculture are harmonised and accessible across relevant sectors and levels of government such that their combined effectiveness as a control and planning tool is maximised.*

The following Results are proposed to achieve the Specific Objective:

Result 1: the M&E system is effectively integrated across sectors and levels of the administration.

Result 2: performance of agriculture sector strategies are regularly and effectively monitored.

10.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: M&E system is effectively integrated across sectors and levels of the administration							
1.1	All environmental indicators relevant to the agriculture sector are harmonised across the different M&E systems	MINAGRI (leading)	MINIRENA, MININFRA NISR	Revision of all relevant indicators in EDPRS, SPTA2, ENRSSP, NSCCLCD to ensure corresponding indicators are formulated in exactly the same manner. Alignment to existing NISR indicators to be considered.	Detailed review of indicators completed	Agreement on harmonised list of indicators	Official adoption of agreed indicators in respective M&E frameworks
1.2	All environmental indicators relevant to the agriculture sector have an associated methodology for their application (Metadata)	MINAGRI (leading)	MINIRENA, MININFRA NISR	Careful consideration of methodologies to make best use of accessible and cost-effective data, but which provide objective and relevant indication of performance.	Review of methodologies associated to relevant indicators	Completed metadata doc, incl. dev. of methodologies	GOR adoption of Metadata document (official NISR document)
1.3	Indicators used for reporting of advance in achievement of Performance Contracts are aligned to the harmonised indicators	MINALOC	MINAGRI		Review of PC indicators being used and degree of alignment	Agreement on use of harmonised indicators in PCs (by District authorities)	Effective integration of aligned indicators in PCs
1.4	A harmonised reporting framework for all M&E systems is established, where data are readily accessible to all relevant institutions	MINECOFIN	MINAGRI MINIRENA MININFRA	Requires setting up MIS. To guarantee accessibility to local government's, provide computers, Internet, training.	Analysis of options for setting up MIS	Acquire MIS platform; set-up system	MIS in use by all key actors†
Result 2: Performance of agriculture sector strategies are regularly and effectively monitored							

† These include: MINAGRI, MINALOC, MINECOFIN, MINIRENA, RAB, RNRA, District Authorities and Sector Authorities.

2.1	SPTA3 integrates a detailed M&E framework for follow-up of its logical framework indicators, including measurement methodologies, periodicity of monitoring and reporting	MINAGRI	RAB Districts	Framework should address recommendations made in Chapman (2011). It will most certainly require gathering of data from local governments.	Integrate M&E framework as part of SPTA3	Adopt M&E framework as integral part of SPTA3	Implementation of M&E framework

11 Systemic issue 2: Climate variability and climate change

11.1 Introduction

Rwanda is located astride two key climate regions, and its climate can be described as complex, showing wide variations across the country and with a strong seasonality. Climate variability in Rwanda depends on a number of factors, amongst which the El Niño Southern Oscillation (ENSO) events are particularly important. Climate variability gives rise to climatic disasters, such as flooding, landslides and droughts, with considerable impact on livelihoods, mainly due to decreased agricultural productivity or crop failure. There is a wide gap for climate variability adaption.

Global Circulation Models (GCM) predict an increase in rainfall as well as increase in temperatures, which will have effects primarily in the agriculture sector, and for which Rwanda must develop capacities to adapt.

11.2 Policy and regulatory framework

Rwanda has ratified the UNFCCC as well as its Kyoto Protocol. In the context of the UNFCCC it has prepared its National Adaptation Programme of Action (NAPA) and two National Communications. The NAPA defines priority areas for adaptation.

Recently (October, 2011) it has approved its National Strategy for Climate Change and Low Carbon Development (NSCCLCD), which defines 14 Programmes of Action, two for which the agriculture sectors is to take the leading role for implementation (Programmes of Action 1 on 'sustainable intensification of agriculture' and 2 on 'agricultural diversity for local and export markets'), and 9 for which the agriculture sector takes a secondary role[1].

11.3 Institutional framework

Responsibilities for climate change related issues are shared amongst different institutions. REMA has created the Climate Change and International Obligations Unit (CCIOU), which also acts as Designated National Authority (DNA) for carbon market activities. The Rwanda Meteorological Service (RMS), recently been designated as an autonomous agency, is responsible for collection of meteorological data and weather forecasting. In terms of disaster management, there is a Disaster Management Unit (DMU) under the Ministry of Disaster Preparedness and Refugee Affairs, which carries out disaster risk assessment studies in the sensitive parts of the country.

11.4 Baseline

Rwanda often experiences disasters related to climate variability that impact on agricultural productivity, especially floods and droughts. Floods have increased in frequency over the past decade, such as the flood events of the Nyabarongo and Akanyaru rivers and its tributaries in 1963, 1979, 1998, 2001, 2002, 2006 and 2007 (UNEP, 2011). Droughts are especially a threat in the east and southeast of the country, mainly triggered by a prolonged dry season or a delay in the onset of the rainy season. Recurrent drought incidence over the past decade, between 1998 and 2000 and annually from 2002 to 2005 has had significant impacts on food security (UNEP, 2011). Seasonal yield losses have also been directly attributed to climatic variances (e.g. coffee reduction by 26% in 2009/10 and significant maize losses in eastern districts in the 2010B season) (Byamukama *et al*, 2011).

The impacts and economic costs of current climate variability and events are already significant, and likely to increase with climate change (SEI, 2009).

The effects of climate change are very difficult to predict for Rwanda due to its geographical position (between two important climate regions); in addition there is a large gap in historical meteorological data due to the destruction of meteorological stations during the times of conflict. Continuous records are only available for the meteorological station in Kigali airport. At the moment there are only 13 synoptic

stations and 5 automatic stations, along with 26 rainfall stations and 38 more planned for installation; also, MINAGRI operates 88 stations for agro-meteorological purposes (Byamukama *et al*, 2011).

Climatological observations indicate, however, that climate change is very likely happening in Rwanda[2] (UNEP, 2011). Expected outcomes of climate change in Rwanda include increased rainfall[3] (up to 20% by the 2050s and 30% by the 2080s), increases in mean annual temperature (up to 3.25ºC for the region by 2100) (Byamukama *et al*, 2011) prolonged periods without rain and an extension of the dry season (UNEP, 2011).

The effects of climate variability and climate change are especially felt in the agriculture sector, which is highly vulnerable. Changes in rainfall intensity and patters, floods, drought and changes in temperature can all affect agricultural productivity in a significant way, especially in countries like Rwanda, which rely primarily on rain-fed agriculture.

Positive effects on crop yields could also be experienced, associated to the increase of CO_2 levels or to warmer conditions in the highlands. However there is a myriad of complex relationships that are yet difficult to establish due to the lack of baseline data and modelling, such as drop in crop yields due to temperature increases and increase in pest incidences.

A weather insurance system, operated through the Banque Populaire, is available to farmers, albeit yet to a limited extent, but under expansion. Weather insurance is potentially very powerful as a climate variability and climate change adaptation measure.

11.5 Trends

The GoR has developed a high degree of awareness on the challenges from climate variability and climate change, which is already reflected in the institutional set-up and in the approval of the NSCCLCD. As well there are various initiatives in progress that will allow Rwanda to narrow the gap for climate variability and climate change adaptation.

These initiatives include projects aimed at rehabilitating meteorological stations, which will permit better weather forecasting[4], as well as the further development of an Early Warning System (EWS) (being developed with UNEP/UNDP). The rehabilitation of the network of meteorological station will complete a basic element needed to address climate variability and climate change adaptation.

The expansion of the weather insurance for farmers will increase their adaptation to climate variability and climate change.

Strategies in the agriculture and ENR sectors promote activities that are convergent with climate change adaptation efforts, contributing to reducing the adaptation gap. To give but a handful of examples, SPTA2 promotes expansion of irrigated agriculture, rainwater harvesting, increased land productivity, soil erosion control; ENRSSP promotes afforestation; etc. Nevertheless the degree of integration of climate change into sectoral policies remains weak, as evidenced by a recent review undertaken commissioned by DFID (Dyszynski *et al*, 2011).

There are concerns that the CIP, as currently being promoted, conveys a risk of reducing opportunities for adaptation, linked to flexibility in crop and variety selection as well as to impacts on agro-biodiversity (see Technical Issue 3).

11.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats associated to this systemic issue.

Table 8 SWOT analysis for climate variability and climate change

Strengths	Weaknesses
• Institutional structures are in place for climate change management and inter-institutional	• As to date very limited network of meteorological stations (necessary for climate variability and

coordination • The NSCCLCD is a solid strategy that is the basis for triggering some adaptation efforts • The NAPA has defined priority actions for climate change adaptation • SPTA2 strategies are largely convergent with climate change adaptation	climate change forecasting) • Lack of adequate down-scaled model for climate change predictions for Rwanda, linked largely to unavailability of basic data • Lack of modelling of crop yields and water availability under different climate change scenarios • High vulnerability to extreme climatic events, especially floods and droughts • High dependence on rain-fed agriculture • Many rural feeder roads highly vulnerable to intense rainfall and floods • Limited coverage of insurance against weather-related crop failure
Opportunities • High level of awareness at high levels of decision-making on importance of climate change adaptation, including willingness to mainstream climate change into SPTA3 and EDPRS2 • Work in progress to improve the infrastructure capacity for RMS • Work in progress to establish an EWS; FEWS[5] already operative at a regional/national level • Donor interest to address climate change adaptation in Rwanda (e.g. DFID, UN) • FONERWA (National Climate and Environment Fund of Rwanda) being established with broader mandate which also covers climate change • Commitment to mainstream the NSCCLCD into Vision 2020, EDPRS 2, sector policies and strategies, as well as into sub-national arrangements • Various international climate change funds available for the agriculture sector in Rwanda • Various opportunities to attract private investment	**Threats** • International climate funding will not be sufficient to finance the NSCCLCD, which will need to draw from domestic sources of revenue and leverage capital for low carbon and adaptation activities • Crop selection strategy under CIP may undermine the flexibility needed for crop selection by farmers, and the development of farmers' capacities to make informed decisions • Promotion of inorganic fertilisers are the main source of GHG in Rwanda and a key element of CIP. • Discouragement of inter-cropping reduces options for minimisation of fertiliser use (nitrogen fixation) • Mono-cropping, often with improved seeds, poses risk to agro-biodiversity, which can be important for adaptation to climatic (and other) shocks • Population growth exacerbates pressure on resources vulnerable to climate change (e.g. land)

11.7 Synthesis, proposed specific objectives and required results

The challenges of climate variability and climate change are already on the policy agenda and they start to be addressed. These are especially relevant to the agriculture sector, due to its high vulnerability. Some of the challenges on the right track to be addressed include the critical re-construction of the network of meteorological stations. Other aspects are integral elements of some of the Technical Issues covered in this SEA, and are thus addressed in the corresponding sections; such is the case of aspects having to do with optimal use of fertilisers, climate proofing of roads, and integration of climate change considerations into CIP crop and variety selection.

Recommendations are focused on aspects of research, mainstreaming into SPTA3, water use efficiency, EWS, agro-biodiversity and awareness raising.

The proposed Specific Objective to address this key issue is: *the agriculture sector strengthens its climate resilience capacities*.

The following Results are proposed to achieve the Specific Objective:

Result 1: climate change is mainstreamed into SPTA3.

Result 2: vulnerability to climate variability and climate change in the agriculture sector is reduced.

11.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: Climate change is mainstreamed into SPTA3							
1.1	SPTA3 process explicitly addresses integration of NSCCLCD Programme 1 on 'sustainable intensification of agriculture', especially with regards to implications to the CIP, and Programme 2 on 'agricultural diversity in local and export markets'	MINAGRI	MINIRENA	MINAGRI-MINIRENA-REMA Task Force	Result 1: Climate change is mainstreamed into SPTA3 Relevant NSCCLCD objectives+ indicators reflected in SPTA3	Approved SPTA3 provides strategies + means to achieve NSCCLCD	-
1.2	SPTA3 component on RFR addresses NSCCLCD Programme 9 on "efficient resilient transport systems" with regards to climate-proofing on roads	MINAGRI	MININFRA				
Result 2: Vulnerability to climate variability and climate change in the agriculture sector is reduced							
2.1	Early Warning System is upgraded	RMS	MINAGRI MINIRENA	Support from FEWS experience	Road map for EWS upgrading	Upgraded EWS piloted	EWS fully functional
2.2	Agriculture sector climate change vulnerability assessment is carried out, to inform aspects of crop and variety selection	MINAGRI RAB	MININFRA MINIRENA	Including modelling of crop yields and pest onsets under different temperature and rainfall scenarios Will require strengthening of capacities	ToR for vulnerability assessment completed	Strengthen technical capacities Vulnerability. assessment.in preparation	Vulnerability assessment completed
2.4	Awareness raising on climate change is strengthened amongst farmers	Districts	RAB REMA Private service providers	District + private extension force	Climate change awareness raising strategy prepared	Extensionists trained on climate change awareness	Farmers trained on climate change awareness
2.5	Protection of agro-biodiversity is promoted and monitored, in line with National Biodiversity Strategy	MINAGRI MINIRENA			Protection of agro-biodiversity strategy integrated in	Agro-biodiversity protection strategy implemented	Agro-biodiversity protection strategy implemented

					SPTA3, including definition of indicator	in CIP areas	in 75% of farming areas
2.6	Farmers' insurance against weather-related crop failure is further promoted	MINAGRI	RMS		See T3	See T3	See T3
2.7	SPTA3 introduces an indicator on '% of farming households covered by weather-related crop failure insurance policy'	MINAGRI			Indicator defined	Indicator functional	

12 Systemic issue 3: Environmental Impact Assessment system

12.1 Introduction

Environmental Impact Assessment is a fundamental tool to identify potential environmental impacts of development projects, and thus define a project alternative which is environmentally sustainable and which minimises environmental impacts and risks. EIA is also a decision-informing tool for the competent environmental authorities to be able to authorise or not – on environmental sustainability grounds - a proposed development project, and define the necessary conditions of approval.

Environmental integration into project design, construction and operation is fundamentally sustained in the EIA system. Environmentally sensitive projects must prepare an EIA that identified and assesses its potential impacts on the environment, and devise measures to eliminate, or mitigate and manage such impacts. These measures are synthesised in an Environmental Management Plan (EMP), which is essentially a document containing the details as to how mitigation measures will be implemented and monitoring carried out.

Project authorisation is conditioned to the issuing of an EIA Certificate, which specifies conditions for EMP implementation. However there is concern that EMPs are not being adequately implemented by developers due to REMA's limited enforcement capacities. REMA will in the first quarter of 2012 deploy an environmental officer in each District, whose main duties will be monitoring EMPs of implemented projects[1]. This welcome District-focussed human resources initiative needs to be matched by action at the REMA centre to assure that the EIA/EMP system fulfils its purpose and puts into the effect the obligation of 'the operator' to submit (compliance focussed) EMP implementation monitoring reports, in consistency with the provisions in the EIA Guidelines.

12.2 Policy and regulatory framework

Organic Law N°04/2005 determining the modalities of protection, conservation and promotion of environment in Rwanda makes provisions for EIA (Chapter IV), whereas 'every project' is subject to EIA before obtaining authorisation for implementation. Art. 68 establishes the minimum contents of an EIA, and which include a definition of mitigation measures as well as an indication as to how the state of the environment will be monitored and evaluated "before, during the activities of the project, in using the installation but particularly after completion of the project". The EIA procedure proper is specified in general terms in a Ministerial Order (2008) 'relating to the requirements and procedures for environmental impact assessment'.

The EIA has to be in conformity to REMA "Guidelines and procedures for Environmental Impact Assessment" (2006). The Guidelines categorise projects (based on a screening procedure) so as to determine the degree of detail required by the EIA[2]; they also define details for approval of the EIA report and for monitoring.

12.3 Institutional framework

REMA is the end institution legally responsible for the EIA system[3]. However many of the responsibilities for managing the EIA system on a day-to-day basis in the agriculture sector, including the issuing of EIA Certificates, has been delegated to RDB which nevertheless has to feed back to REMA all advice and recommendations received.

12.4 Baseline

The EIA process is clearly described in the REMA EIA Guidelines. The aspects analysed below are related to the effectiveness in the implementation of EMPs, and the corresponding monitoring. There are some fundamental moments in the EIA process (as specified in the Guidelines) that must be recalled:

1. The EMP is an integral part of the Environmental Impact Report. In words of the EIA Guidelines: *"in this section, tasks to ensure the implementation of mitigation measures and monitoring of impacts should be presented. This is a plan for*

monitoring and management of impacts during the implementation and operation of the project, where the responsibilities between the state and investor are differentiated".

2. REMA issues an Implementation and Operations Order (IOO), specifying compliance terms and conditions to be met during project implementation and operation; they indicate requirements for implementation, impact mitigation and environmental monitoring.
3. Once the IOO is agreed, the EIA Certificate of Approval – a binding document - is issued.
4. Self-monitoring, self-record keeping and self-reporting are foreseen. However it is also specified that the information gathered through monitoring shall be recorded and forwarded to REMA annually.

In spite of a robust regulatory framework for the EIA/EMP system, there are some concerns about the effectiveness of the EIA system that REMA is aware of:

- EMPs are not implemented by all project developers[4];
- EMP (success focussed?) monitoring reports are mostly not being submitted to REMA, which essentially relies on its (problem focussed) inspection functions that necessarily stretch REMA human resources capacity;
- As discussed in the SEA Workshop, in the case of agriculture projects there are uncertainties as to who assumes responsibility for monitoring during a project's operational phase, as the developer that submits the EIA Report and obtains the EIA Certificate would normally transfer the project to the farmers for the operational phase.

12.5 Trends

Projects in the agriculture sector (especially related to creation of rice fields) will continue to be developed, most associated to potential environmental impacts which the EIA/EMP system is meant to contain:

- increase in wetland reclamation will increase risk of soil contamination, soil salinization and freshwater depletion;
- an important increase in water use from different sectors (including for irrigated agriculture) will increase pressure on available water resources, compromising the ecological water flow and leading to inter-sector competition for the resource;
- an important increase in the use of fertilisers and pesticides have a large potential of increasing water contamination and further contributing to eutrophication; and
- an increase in agro-industrial activity is expected, for which track records have shown a large degree of non-compliance with environmental regulations (e.g. in terms of waste water treatment).

In a framework of an ineffective EIA system due to insufficient implementation of EMPs and absence of monitoring, environmental risks associated to agricultural development will be multiplied. The EIA/EMP system calls for an urgent revision to guarantee its effectiveness.

12.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats for this systemic issue.

Table 9 SWOT analysis for effectiveness of the EIA system

Strengths	Weaknesses
• EIA system is in place and covers all major development projects • Robust EIA procedures are in place, largely consistent with international good practices • REMA is a well-respected environmental regulatory body • EMPs are established as an integral part of EIA reports • System of licensing based on EIA considerations (EIA Certificates) in place • Well designed guidelines for the preparation of EIAs	• EMPs are not satisfactorily being implemented, including monitoring • Annual monitoring reports (specified in the EIA Guidelines) are not being submitted by all developers to REMA • REMA has limited capacities to carry out inspection (to verify EMP compliance) • No clarity as to who is considered the 'developer' during the long-term operation of agricultural developments (e.g. wetland reclamation; irrigation systems), basically for purposes of obligations for monitoring and reporting • EIAs generally do not take into account the expected effects of climate change in their analyses (especially relevant for water management and infrastructure sensitive to intense rainfall and flooding)
Opportunities	**Threats**
• Recognition of deficiencies in the EIA/EMP system amongst key actors, including REMA (especially with regards to degree of implementation of EMPs) • REMA planned (2012) deployment of a monitoring officer in each district • Relatively easy to improve effectiveness of the EIA system once an adequate effectiveness assessment has been completed • REMA can greatly enhance its enforcement capacities by ensuring full implementation of provisions in the EIA Guidelines with regards to submission of annual monitoring reports • REMA can specify responsibility for EMP implementation for long-term operation of agricultural developments in EIA Certificates	• Increased activities in agro-industry, wetland reclamation and use of fertilisers may lead to increased environmental impact in the context of an ineffective EIA/EMP system • Climate change is likely to increase vulnerability to environmental disasters • Pressure to develop industrial sector may be an obstacle for effective enforcement of EIA system • Potential conflict of interest by RDB managing the EIA system and promoting investments at the same time

12.7 Synthesis, proposed specific objectives and required results

The proposed Specific Objective to address this key issue is: *the EIA system contributes effectively to environmental sustainability of development projects*.

The following Results are proposed to achieve the Specific Objective:

Result 1: EMPs are fully implemented and reporting to REMA done also according to the EIA Guidelines.

Result 2: Climate change considerations are integrated into the EIA system.

12.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: EIAs are fully implemented and reporting to REMA also done in accordance with the EIA Guidelines							
1.1	REMA undertakes a comprehensive EIA/EMP effectiveness assessment to determine a strategy for enhancement	REMA	RDB	EIA effectiveness assessment with potential donor support	ToR for EIA effectiveness assessment	Effectiveness Assessment completed	
1.2	REMA implements EIA/EMP effectiveness enhancement measures based on assessment study (Result 1.1)	REMA	RDB	EIA effectiveness enhancement with potential donor support	ToR for EIA effectiveness support	Effectiveness enhancement support initiated	Effectiveness enhancement support completed
1.3	RDB routinely reflects the EIA Guidelines requirement that annual monitoring results are submitted to REMA	RDB		RDB own internal procedures	Mandatory annual monitoring reports specified as part of EIA Certificate	REMA receives annual monitoring reports	
1.4	EMP monitoring reports are filed by REMA and accessible for consultation	REMA	RDB	REMA internal procedures		Annual monitoring reports filed and accessible	
1.5	Clarification made in the EIA Guidelines on who is considered to be the 'developer' during the long-term operation of agricultural projects, for effects of routine environmental monitoring	REMA RDB	MINIRENA Districts/ Sectors (projects may be handed over to local authorities)	Inter-institutional coordination and legal advice	Revision of EIA Guidelines	Clarification incorporated in relevant documents	
Result 2: Climate change considerations are integrated into the EIA system							
2.1	The EIA Guidelines are revised to integrate consideration of climate change adaptation and mitigation as part of the EIA	REMA	RDB	REMA-led with potential donor (TA) support		EIA Guidelines revised	EIA reports incorporate climate change aspects

13 Systemic issue 4: Local capacities

13.1 Introduction

Decentralisation is one of the cornerstones of Rwanda's public sector reform, which responds to a large extent to the subsidiarity principle (planning and decision-making is done at the lowest administrative level feasible). In practice this means that the local government assumes a very large degree of responsibility for the implementation of sector policies[1].

Rwanda has made impressive improvements in its local capacities in the post-1994 period, but important challenges remain. These challenges have not passed unnoticed but rather, have been focus of attention for some years now. Various analyses of local capacities have taken place, including a recent Capacity Needs Assessment and the development of a new Strategic Capacity Building Initiative (World Bank, 2011)[2].

Local capacities is broader than just 'know-how' of staff; it includes aspects such as, *inter alia*, access to operational resources and facilities in order to perform a job efficiently, motivation, and on-going training. Division of responsibilities is also addressed here as necessary for good performance while absolute numbers of staff and/or their work burden may also be a constraint.

The definition of capacity building is broad. It is a holistic enterprise, encompassing a multitude of activities. It means building abilities, relationships and values that will enable organizations, groups and individuals to improve and sustain their performance and achieve their development objectives. It includes strengthening the processes, systems and rules that influence collective and individual behaviour and performance in all development endeavours. And it means enhancing people's technical ability, willingness and initiative to play new developmental roles and adapt to new demands and situations. Among institutions, and within their networks, it includes examination of opportunities to achieve required outcomes with greater efficiency of resource use through simplification, harmonisation and convergence of practices, with selective adoption of modern information and communications technology (ICT).

13.2 Policy and regulatory framework

The key policy of relevance to local capacities is the National Decentralisation Policy (2000). Decentralisation has taken place in tandem with a far-reaching Public Sector Reform, which redefined the structure of the local administration. The EDPRS is also a fundamental policy document, as public sector capacity building is an integral part of it.

In terms of environmental management at the local level, Prime Ministerial Order N°126/03 determines the responsibilities, organisation and functioning of the District and Sector Environment Committees.

13.3 Institutional framework

Coordination of local authorities is provided under MINALOC. In terms of public service capacities, MIFOTRA also has an important personnel training coordination and quality assurance role to play. At the sector level MINAGRI and MINIRENA are faced with the challenge of ensuring a good coordination with the Districts, so their respective sector policies find their way to local level implementation. Through MINECOFIN high levels of financial autonomy – covering both the recurrent budget and procurement under development budgets – are delegated to District administrations. MINECOFIN also administers the sectoral distribution of earmarked funds to the Districts, such as the funds (some from EU SBS) channelled on behalf of MINAGRI to specific components of SPTA2 implementation and on behalf of MINIRENA to environmental investments.

At the local level the administrative structures are Districts, Sectors, Cells and Villages. The administrative structure at the district level consists of the supreme body – the Council, an Executive Committee with an elected mayor and two elected vice-mayors (who serve five years in office and a maximum of two terms), all of whom have executive authority and are salaried, assisted by the Executive Secretary (who is also the

Chief Budget Manager). There are six departments;[3] for the agriculture sector there is provision for an agronomist, positioned under the Director for Economic Affairs. In terms of environmental governance, Environment Officers are recruited at the District level (all districts have at least one environment officer), and placed under the Department for Lands, Town Planning, Housing and Infrastructure (at the sector level, the agronomist is responsible for ENR matters).

Every District also has an Infrastructure Officer, Lands Officer and Forestry Officer (Annex B13.1). All officers have an annual performance contract; the District performance contract is signed and presented by the Mayor before the President of the Republic – an administrative arrangement unique to Rwanda.

At the Sector level there is an equivalent smaller executive structure (with individual performance contracts) headed by an Executive Secretary whose deputy is the Legal Officer. Sector financial management is not autonomous but based largely on a system of Requisition to the District; this includes the management of earmarked funds over which Sectors have little control. Communications between Sectors and Districts are mostly by telephone and hard paper copies of documentation[4]. As a notable exception to the general pattern, in 2011 Nyagatare District supplemented its already advanced ICT system (integrating Sector offices) with supply of internet-linked mobile phones to all officers at District and Sector level.

As illustrated at Annex B13.1, there is provision for one agronomist who has to deal with aspects of rural infrastructure, lands adjudication/title registration, forestry and environmental management (responding to the respective four designated officers at District level) in addition to the 'primary' focus on agriculture, livestock and horticulture.

There are also special arrangements where two technical ministries deploy full-time staff at Sector level. MINAGRI, through RAB (from its own payroll), deploys a Livestock Veterinary Assistant in each Sector to give technical and animal nutrition advice mainly for the One-Cow programme and provide associated Artificial Insemination and vaccination services, while MINIRENA, through RNRA, deploys a Forestry Officer in the ratio of one for every two Sectors. The Sector Forestry Officers spend most of their time on supporting forest management, including regulating harvesting and replacement, but they also have responsibility for lending support to agro-forestry.

At Cell level there are two salaried posts. The Executive Secretary performs largely statistical and administrative functions while the Social Development Officer (better known as the Integrated Development Programme Officer or 'IDP') performs a number of functions that reflect the role of the Sector Agronomist; often the IDP is an agronomy diplomate. With regard to ENR, the IDP is typically the custodian of the Cell agro-forestry nursery that is supplied by tree seeds from RAB (formerly ISAR).

Prime Ministerial Order N°126/03 defines responsibilities of the Environmental Committees[5] at district, sector and cell levels, which include, inter alia, aspects related to: monitoring of forests management; ensure monitoring of management of marshlands; M&E of environmental policies and programmes; ensure strategies against soil erosion are executed (sector and cell levels); ensure tree planting (cell level). The officer at the end of the chain of command responsible for implementation is the IDP.

MINAGRI and MINIRENA play key roles with their permanent placement of personnel at Sector level; additionally there is seasonal deployment of a RAB CIP Officer at District level in concert with one or more contracted CIP service providers who organised seed and fertiliser distribution and provide related extension advice.

13.4 Baseline

The EDPRS defines, as one of the performance indicators, the 'No. of households per extensionist' and sets a target of a 1:1,500 ratio (the 2005/06 baseline being 1:3,000). Tests of this target in the field suggest this numerical target is yet far from being met although the new developments since 2008 are as follows: 1 agronomist and 1 veterinary assistant are at sector level and a staff at cell level in charge of integrated development programme (IDP).

The administrative structure for local governments is described in the section above, which also shows that central government provides some additional support. It should also be pointed out that service providers sometimes also provide extension services, as well as the large projects (e.g. KWAMP, LWH).

The role of the agronomist, at the district and sector level, is not altogether clear. It would seem that its role mainly relates to management and coordination, not implementation (World Bank, 2011). In practice agronomists are indeed expected to engage in implementation, however challenging these tasks are in light of their work portfolio. MINAGRI (2008) have pointed out that *"it is not clear what is expected from the agronomist"*; for example, *"some agronomist seem only marginally aware of the budget for the earmarked grant, but do not feel they have any responsibility in planning and budgeting for or managing that budget"*, whereas in the understanding of the authors of that report district agronomist should have primary responsibility for achieving the objectives of the agriculture sector, and hence for the activities under the sector earmarked grant. The job description of the agronomists begs for a clarification.

As mentioned in the previous section, agronomists at the sector level also have to deal with aspects of rural infrastructure, land and NR management. Moreover, they are usually also engaged in administrative matters, sometimes beyond their area of work. The very limited number of staff available to deal with agriculture aspects at the local level is, without a doubt, insufficient. These heavy work-loads not only result in insufficient degree of attention given to their primary areas of responsibility, but also result in lowering the morale and motivation.[6]

In addition to the above, the professional capacities of agronomists are also an issue. The 2009 National Skills Audit revealed that the agriculture sector alone accounts for 35% of the total skills shortage in the country, and that there was a skills gap of some 60% for agricultural technicians (UKAID, 2011). Other aspects add to the challenges for local capacities: limited professional experience of technical staff; high level of staff turnover of skilled personnel, and thus no building of institutional memory; and inadequate or insufficient work tools, including, e.g. ICT and transport.

There are various root causes for the above, including low paid jobs and inequalities in pay amongst different organisations (which motivate skilled personnel to seek employment elsewhere, e.g. in agencies, projects or the private sector).

Finally the placement of the 'agronomist' in the district and sector organograms may be contributing to limiting best use of their potential. At the district level the agronomist is positioned under Economic Affairs, which acts more as the Planning Department, and the planner heading the section may not necessarily have affinity with agricultural activities to adequately supervise the agronomist (MINAGRI, 2008).

13.5 Trends

The drivers that result in low capacities for implementation of the agriculture strategy at the local level are unlikely to change in the short-term, although the issues have been identified and highlighted. With the expected increase in donor contributions to the agriculture sector there is, however, a potential to canalise some of these resources to strengthen local level capacities. Broader actions at the central level will nevertheless be necessary, such as increasing the skills level of graduates from national universities, securing job motivation and decreasing the salary gap between the public service and the private sector. Progress in these variables will probably start showing in the medium-term.

13.6 SWOT analysis

A SWOT analysis is presented below, synthesising the strengths, weaknesses, opportunities and threats with regards to local capacities.

Table 10 SWOT analysis for local capacities

Strengths	Weaknesses
• Local authority commitment in capacity building • Existence of institutions involved in capacity building of local authorities (e.g. Rwanda Governance Board and RALGA) • High level of awareness of challenges with regards to local capacities • Donor support (EC) indirectly targeted at decentralisation of the agriculture sector • Environment Committees have high potential for coordination at the local level on environmental matters • Precedent established for adoption of ICT and mobile e-communications between District and its Sectors (Nyagatare) • Precedent established for permanent deployment of Sector Infrastructure and Lands Officers (Ngororero)	• Complex structure of sectors and cells vis-à-vis limited decentralised resources • Limited financial autonomy for sectors • Budgetary constraints • Limited number of skilled technicians available in the country • High work load of Sector agronomists, dealing with multiple sectors; an additional staff in charge of infrastructure and land is required to cope with the tasks and to release the agronomist for the breadth of duties related to ICM as defined under Issue T4 • Limited ICT facilities (only seen in Nyamagabe District) • Limited mobility for agronomists
Opportunities	**Threats**
• Donors interested in local level capacity building • Sectors and cells can become well organised • Earmarking of funds to support adoption of ICT and mobile e-communications between District and its Sectors • Earmarking of funds to support permanent deployment of Sector Infrastructure and Land Officers	• Salary gap between the public and private sectors, as well as between public institutions • Graduate quality and output of higher education establishments may not keep pace with demand

13.7 Synthesis, proposed specific objectives and required results

Due to the degree of decentralisation in Rwanda, adequate capacities for planning, coordination and implementation at the local level are critical to guarantee good performance in the agriculture and ENR sectors. Many are the challenges that districts and sectors face in terms of capacities, ranging from the mere numbers of staffing and levels of experience and academic training, to issues of ambiguous definition of responsibilities, motivational factors, ICT facilities, mobility, etc.

Some aspects are to be approached at a high strategic level and in the medium and long-term, e.g. those related to development of university curricula. This report will focus on the more immediate concerns, and which could be solved in the short- and medium-term.

The following Results are proposed to achieve the Specific Objective: *Enhance local level capacities for planning, coordination and implementation of agriculture and ENR strategies and their M&E*

Result 1: Increased capacities of agronomists and environment officers

Result 2: Redefined key functions of local level staff for agriculture so as to optimise input

13.8 Activities proposed, responsible institutions and means

		Responsible Institution	Supporting institutions	Means	Proposed Objectively Verifiable Indicators and their timelines		
					12/2012	12/2013	12/2014
Result 1: increase capacities of agronomist and environment officers							
1.1	Provide training, as necessary, to enhance capacities of agronomists and environment officers	RAB RNRA	Districts MINALOC	Needs assessment; ad hoc training design In coordination with R2.3	Needs assessment promoted	Trainings in 50% of districts	Trainings in 100% districts
1.2	Develop a retention strategy (e.g. staff benefits) to reduce staff rotation	MINALOC	MIFOTRA MINAGRI MINIRENA Districts		Strategy defined	Policy dialogue seeking opportunities implement'n opportunities	
Result 2: redefine key functions of local level staff for agriculture so as to optimise input							
2.1	Clarify functions of agronomists at district and sector level	MINALOC	MINAGRI Districts	Policy dialogue	Functions clarified		
2.2	Produce a job description for agronomists at district and sector level	MINALOC	Districts			Job description produced	
2.3	Train agronomists to ensure common understanding of their roles and responsibilities	MINALOC	Districts	Training designed; link to on-going training	Training designed	50% of agronomists trained	100% agronomists trained
2.4	Secure hiring of land and infrastructure specialist at sector level, so as to free up responsibilities of agronomist	MINALOC Districts	MINAGRI MINIRENA MIFOTRA MINECOFIN	Dialogue to secure agreement and seek sources of financing	Agreement reached	Sources of financing secured	New position implemented in 25% sectors

SECTION C

RECOMMENDATIONS

Based on the foregoing analysis and the team's knowledge of on-going developments and the pipeline of stakeholder commitments, this Section presents a synthesis of the recommended actions, distinguishing those addressed to MINAGRI for the enhancement of SPTA3's environmental performance; those addressed to the European Commission for better reflecting key environmental concerns in their support to the SBS to the agriculture sector; and those addressed to other institutions, whose role will be important in contributing to the environmental sustainability of the agriculture sector.

14 Recommendations to the GoR to enhance environmental performance of the agriculture sector

14.1 Recommendations to be addressed in SPTA3

Most of the opportunities to enhance the environmental performance of the agriculture sector should find a place within the scope of SPTA3. The recommendations synthesised here refer only to those aspects that should be reflected in the SPTA3 document; to a large extent they provide a response to changes in policy thinking that have been taking place amongst stakeholders in the sector, but had not yet found an opportunity to be expressed in the relevant strategic and policy documents. In other cases they emphasise policy aspects and activities that were already present in SPTA2, but which have not been given the degree of attention we now believe they deserve due to their potential to contribute significantly to enhance the sector's environmental performance.

All recommendations are found in the sections dealing with the technical and systemic issues above (Sections 5 to 13). This section singles out those aspects that can be reflected directly in the SPTA3, and are presented as a summary. Recommendations that are best handled outside SPTA3 are summarised in Section 14.2 below[1], whereas recommendations to be reflected in EDPRS2 are addressed in Section 14.3 below.

An indication is given in parentheses to categorise recommendations according to: (a) interventions that should be continued; (b) reinforced/increased; (c) modified; or (d) introduced for the first time. As well, an indication is given of their priority (top-, high- or medium priority).

Systemic issues 3 (EIA system) and 4 (local capacities) are not referred to in this section, as recommendations are primarily addressed to actors outside the agriculture sector.

General principles

- Efficiency (best use possible of limited resources) and effectiveness (best strategy to achieve results) must always guide the selection of activities.
- Objectives are often best achieved by the selection of strategies whose components have amplifying effects, rather than individual measures. In this context the concept of Integrated Crop Management (ICM) can be seen as a guiding principle, under which soil and water conservation, acidity correction and nutrient management, and pest and disease management all call for a coordinated approach.
- Empowering farmers through participatory engagement (farmer field schools and other training means) to make informed decisions should be a constant element to secure effectiveness and develop capacities.
- The development of skills and the availability of the resources requited to make use of increased knowledge and capacities should always be promoted where necessary.
- Progress should be measurable. SMART performance indicators must be developed for the most critical expected results.

Soil and water conservation (Technical Issue 1)

- SPTA3 should promote soil and water conservation as an integrating policy focus, and it should be *effectively implemented as an integrated approach*. This means that SPTA3 should not only focus on specific components leaving aside other dimensions, as was the case under SPTA2 (e.g. terracing, hillside dams and irrigation and less attention to agro-forestry and soil cover). District-wide packages of measures should thus be promoted, where land protection and agro-forestry should be incorporated. [modified – top priority]
- As advised by REMA, Rwanda is below UN recommended per capita renewable water resources of 1,000 m^3/person/yr. This triggers a potential concern, especially with the pressure for converting

wetlands into agricultural use. However, the MINAGRI irrigation master plan is advanced in implementation of 101 dams across the country together with other water harvesting infrastructure and promoting water use efficiency. It is concluded that water scarcity is not yet a major concern for the agriculture sector; however, it is becoming a concern at an inter-sector level, and water use efficiency should be incorporated into the irrigation subsector. [introduced for first time – medium priority]

- Focus should be on activities that are the most cost-effective (e.g. in relation to less resource-intensive soil erosion control), and serving a purpose (e.g. species and varieties for agro-forestry must be selected based on the choice purpose – for example fodder, fuel wood, non-timber forest products, construction materials). [reinforced/increased – top priority]
- It is critical that monitoring of soil erosion control gives an objective account of progress, with comparable reporting across the country. [continued – top priority]

Acidity correction and nutrient management (Technical Issue 2)

- Soil conditions for improved yields cannot rely solely on increasing the application of inorganic fertilisers, however necessary these may be. From the perspectives of optimal use of scarce resources (soil), minimisation of environmental risks and impacts, and building resilience for climate variability and climate change adaptation, the focus should change to one of increasing yields with optimisation in use of inputs. This calls for an integrated approach which widens the support menu to encompass all critical factors of production, which must be seen in conjunction also with issue T1 (soil and water conservation), T3 (crop and variety selection) and T4 (pest and disease management). [modified – top priority]
- Two main dimensions to consider in SPTA3 are: managing acidity (an important limiting factor for crop yields) and optimising use of fertilisers. [reinforced/increased – top priority]
- In response to the above, SPTA3 will need to dedicate more efforts to secure acidity correction.
- As well, and very importantly, the focus on increasing use of inorganic fertilisers needs to be changed to one of application of fertilisers based on nutrient needs. Such change will require fundamental changes in monitoring: it is not consistent (nor desirable) to measure intensity of use of inorganic fertilisers; rational use based on nutrient needs MUST be incorporated into the equation. This new focus has important implications for EDPRS2 as well. [reinforced/increased – top priority]
- The focus on efficient use of fertilisers requires the necessary training and capacity building, always keeping in mind the principle of empowering farmers to make informed decisions. [reinforced/increased – high priority]

Crop and variety selection (Technical Issue 3)

- Choice of crops and varieties is central to CIP, and of key importance to secure livelihoods and food security. The CIP is the cornerstone strategy relevant to this issue. However, and in spite of the dramatic increases in crop yields associated, some aspects of the focus currently given to the CIP are being questioned (e.g. on aspects of resilience to climatic shocks, social acceptance, economic feasibility).
- SPTA3 offers a key opportunity to re-share the CIP in order to better secure its objectives in an environmentally sustainable manner. It is noted that several policy objectives (land registration/tenure regularization, land consolidation, Umudugudu settlement model, CIP, SME promotion) are geared to export oriented commercial level modernized and "sustainable" agriculture, with science offering the means to retain agro-ecology in CIP for climate resilience. Nevertheless specifically the following aspects should be given due consideration and effectively incorporated:

- do not set aside the possibility of inter-cropping, which can be highly beneficial in terms of pest and disease management and nutrient management (reducing inorganic fertiliser requirements); [introduced for first time – high priority]
- build flexibility for decision-making of crops and varieties by farmers, developing farmers' know-how and skills to make informed choices – flexibility is important for adaptation to climate variability and climate change; [introduced for first time – high priority]
- build adaptation capacities to climate variability and climate change by requiring all CIP schemes to be accompanied by weather insurance – important in a farming system that increases farmers' vulnerability to climatic shocks. [reinforced/increased – high priority]

Pest and disease management (Technical Issue 4)

- The approach to pest and disease management so far has been centred on the increase in use of pesticides, to the extent that the amounts of pesticides used is taken as an indication of performance in the sector. Considering the environmental and health risks associated to the use of pesticides, this focus is inconsistent with the principles of environmental sustainability and optimal use of scarce resources.
- SPTA3 should change the focus to one where environmental and health risks are minimised. This means using pesticides only when necessary and only in the amounts necessary, as well as fomenting cost effective measures that reduce the need of pesticides. More particularly, IPM requires more serious attention, to the extent that – *based on on-farm pilot results obtained by RAB with non-chemical pest and disease control measures (and their respective indicators)* - success should ideally be measured in relation to avoidance of pests/disease with the least use of pesticides. [modified – high priority]
- Various aspects related to safe management of pesticides are to be addressed by other institutions (e.g. RBS), but MINAGRI should be concerned with the review of manufacturers' instructions so they are suitable for local conditions and labelled in Kinyarwanda. Manuals for correct application should be prepared as part of SPTA3 results, contributing to minimising environmental and health risks. [modified – high priority]

Rural feeder roads (Technical Issue 5)

- Most of the recommendations related to this issue are best addressed by other institutional actors (namely RTDA and District authorities). However MINAGRI can contribute to enhance effectiveness in this sub-sector by providing guidelines to District Development Committees on criteria for prioritising feeder roads, such that ICM orientation is taken into account. [reinforced/increased – high priority]

Monitoring and evaluation (Systemic Issue 1)

- Apart from specific environment-agriculture indicators, which are recommended under some of the technical issues, there are some overarching aspects related to MINAGRI's own M&E system that require attention by MINAGRI in order to ensure M&E can contribute effectively to planning and decision-making.
- Inter-sectoral coordination is fundamental, as different sectors and subsectors (mainly agriculture, ENR, RFR and climate change) have objectives and indicators that relate to the agriculture sector. It should be MINAGRI's role to coordinate these different actors and agree on a harmonised set of indicators (and their associated methodologies). [reinforced/increased – high priority]
- An important shortcoming is that monitoring data and information is not readily available for all authorities concerned; such a harmonised reporting framework should be promoted by

MINECOFIN, but MINAGRI is to make an important contribution. [reinforced/increased – high priority]

- Progress of SPTA2 has not been measured in a systematic basis. This should not be repeated under SPTA3, where proper monitoring and reporting mechanisms should be defined as part of the strategy and all key indicators should be SMART, supported by Metadata and have a defined methodology to measure them. [modified – high priority]

Climate variability and climate change (Systemic Issue 2)

- Many of the strategies and activities promoted in the agriculture sector have benefits in terms of climate change adaptation. However there are some approaches that may be reducing adaptation capacities (e.g. in relation to CIP crop and variety selection, see above), and there are also further opportunities to enhance climate change adaptation and the contributions to climate change mitigation (e.g. in relation to rationalisation in use of fertilisers, increased weather crop insurance).
- The NSCCLCD sets the way forward to Rwanda's green growth. Importantly, two of the strategy's Programmes (on 'sustainable intensification of agriculture' and on 'agricultural diversity in local and export markets') are to be led by MINAGRI, and thus mainstreamed into SPTA3. These programmes are fully compatible with the findings and recommendations made in this SEA, especially with regards to the optimisation in the use of fertilisers, the expansion of IPM up-take and the promotion of integrated soil and water conservation practices, including agro-forestry.
- MINAGRI should make climate change one of its key concerns; for this it will need to generate knowledge and capacities to better understand how the agriculture sector in Rwanda relates to climate change (which may imply post-graduate and/or on-the-job training, participation in regional/international climate change forums, etc.) Activities should include modelling of crop yields under different climate change scenarios, contributions to upgrade and use the EWS, favour climate resilient crops and farming methods (including the protection of agro-biodiversity) and further promote farmers' weather insurance. [reinforced/increased – high priority]

Table 11 below, drawn from Annex 14.1, is divided into two broad sections to enable reference to existing frameworks. On the left are the key elements of the SPTA 2 logical framework activities. Column 2 identifies if the activity (or an associated element) is also included in the Vision 2020, EDPRS and CPAF Frameworks. On the right are included proposed indicators, proposed activities and observations. As requested, this table is presented to identify relevance of this study's proposals to these frameworks but ***it should be noted, as the frameworks do not encompass all the Issues and subjects covered in this study, most of the study's proposed activities and their indicators are not included below***.

Table 11 Suggested activities and indicators in relationship to SPTA2 logical framework sections

Activity	Covered by VISION 2020; EDPRS; CPAF	Proposed Indicator: UPPER CASE IF EDPRS; UNDERLINED IF ALSO CPAF	Proposed Activities	Observations
Programme 1. Intensification and development of sustainable production systems				
Sub-programme 1.1 Soil and water conservation				
Reductions in the rate of soil erosion and restore fertility	**VISION 2020; EDPRS; CPAF**	USE EXACT WORDING OF THE INDICATOR THAT WILL SHORTLY BE	Complement with promotion of less resource-intensive erosion control methods	

		REVISED ON **'% OF ARABLE LAND UNDER SOIL EROSION PROTECTION'**.	Emphasis on awareness raising of farmers on benefits of soil erosion control and training of methods available	Lack of awareness of benefits is an obstacle to implementation
			Redefinition of indicator to measure proportion of arable land under soil erosion protection	To address also sustainability of structures (i.e. proper maintenance)
			Definition of methodology to measure new indicator, and piloting thereof	
Irrigation on hillside farms	EDPRS	**WATER USE EFFICIENCY** OF IRRIGATION SCHEMES ($Mm^3/ha/yr$ OR $Mm^3/t/yr$)	Agreement of indicator on water use efficiency for irrigation schemes ToR for all new irrigation schemes to seek water use efficiency as one of their objectives	Water use efficiency needs to be promoted in context of climate change adaptation and foreseen increased competition for water resources (different sectors). Indicator to be monitored by WUAs for each individual irrigation scheme.
Training of farm households in land husbandry on hillsides and hillside irrigation		WATER USE EFFICIENCY OF IRRIGATION SCHEMES ($Mm^3/ha/yr$ OR $Mm^3/t/yr$)	Training to focus on 'soil and water conservation' approach	This would include aspects of conservation agriculture and irrigation water use efficiency
Sub-programme 1.2 Integrated development and intensification of crops and livestock: crop diversification and intensification				
Increases in agroforestry and agro-silvopastoril activities	VISION 2020; EDPRS	HA OF FARMLAND UNDER AGRO-FORESTRY TREE SURVIVAL RATE (CONSISTENCY WITH NSCCLCD)	Institute **purpose-based agro-forestry**, which implies identifying needs in a participatory manner and selection of appropriate species, and awareness raising of benefits of agro-forestry Train extensionist workers and farmers on purpose-based agro-forestry	Indicator on 'ha of farmland under agro-forestry' to be harmonised with ENR SSP indicator, but a measure of degree of up-take of agro-forestry is needed Indicator on 'tree survival rate' is taken from the NSCCLCD
Review of fodder requirements for the One Cow Programme with recommendations for types of livestock to promote by farm size (fodder generating capacity)				Integrate, where appropriate, fodder production from agro-forestry
% of livestock maintained in intensive systems	EDPRS			This objective remains very relevant to reduce pressure on land from

				livestock
Professionalised and increased honey production				Use of pesticides in nearby fields may affect beekeeping activities.
Strengthen fisheries commodity chains				Although not identified as a priority area, fish farming has to be promoted in compliance with environmental good practices, through EMPs
Sub-programme 1.3 Marshland development				
Marshlands developed with irrigation and drainage systems and farmer training, after EIAs	EDPRS	MARSHLAND AGRICULTURAL DEVELOPMENTS THAT FULLY IMPLEMENT **EMP**S	Regular assessments of EMP compliance by MINAGRI	REMA will also have a major role in enforcing EMP compliance
Sub-programme 1.4 Irrigation development				
Establish the legal basis for water use rights and tenure rights for irrigation systems	EDPRS	WATER USE EFFICIENCY OF IRRIGATION SCHEMES ($Mm^3/ha/yr$ OR $Mm^3/t/yr$)		Not included in priority issues, but should promote water use efficiency
Develop hillside irrigation systems	EDPRS	**WATER USE EFFICIENCY** OF IRRIGATION SCHEMES ($Mm^3/ha/yr$ OR $Mm^3/t/yr$)	Agreement of indicator on water use efficiency for irrigation schemes ToR for all new irrigation schemes to seek water use efficiency as one of their objectives	Water use efficiency needs to be promoted in context of climate change adaptation and foreseen increased competition for water resources (different sectors). Indicator to be monitored by WUAs for each individual irrigation scheme.
Implement pilots for pressurised irrigation on hillsides and fertigation systems	EDPRS	IDEM	Water use efficiency dimension is integrated and measured.	See above
Organise and train hillside farmers for water management, system maintenance and management of finances for irrigation systems			Farmers' awareness raising on water use efficiency	
Sub-programme 1.5 Supply and use of agricultural inputs: fertiliser and agrochemical supply and use				
% farms using inorganic fertilisers	**VISION 2020; EDPRS;**	CHANGE TO: 'NO. OF FARMERS USING FERTILISERS BASED AFTER	Modify the indicator to measure use of fertilisers; develop methodology to measure it; and pilot its	The indicator should be fully consistent to the one defined for the EDPRS, and should

		ACIDITY CORRECTION AND BASED ON SOIL NUTRIENT NEEDS ASSESSMENT FOR THEIR PARTICULAR LAND UNIT' (OR SIMILAR)	application	reflect the efficiency dimension
		SUGGEST TO DROP THIS INDICATOR, AS NOT CONSISTENT WITH PRINCIPLES OF ENVIRONMENTAL SUSTAINABILITY AND RATIONALISATION OF FERTILISER USE	Training to include optimisation of use based on soil nutrient needs assessment	
% farms using pesticides	EDPRS	SUGGEST TO DROP THIS INDICATOR, AS INCOMPATIBLE WITH PRINCIPLES OF ENVIRONMENTAL SUSTAINABILITY AND OF RATIONAL USE OF PESTICIDES POSSIBLE INDICATORS: 'NO. OF FARMERS RECEIVING TRAINING ON P&D MANAGEMENT' '% PESTICIDES MARKETED WITH LABELLING IN KINYARWANDA'		Indicators associated to safe use of pesticides must be integrated It must be ensured that, if use of pesticides is measured, the indicator should always be presented side-by-side the indicator on up-take of IPM
% farms practicing IPM			Develop IPM/Pest Risk Analysis (PRA) protocols, field scouting frequencies and roguing practices completed for all major crops Manuals developed for IPM/PRA and associated practices for all major crops	

# fertiliser demonstration plots			FFS training programmes incorporate modules and Kinyarwanda extension materials for: IPM/PRA and associated practices of all major crops; soil & water conservation; acidity and nutrient management; crop & variety selection; crop-specific protocols for use of pesticides	
# on-going participatory analyses of soils and fertilisation			Undertake trials for acidity correction in all major land units Trials for nutrient management undertaken for staple crops in all major land units Prepare manual of economic soil acidity correction measures and nutrient management for all land units Incorporate elements of acidity correction and nutrient management in training for extensionists and farmers (through FFSs)	Acidity correction is important component for agricultural productivity, and has been largely neglected Based on nutrient needs assessment
			Environmental compatibility of crops and varieties for defined land units determined on basis of experience and guidelines written Patterns of crop-weather interactions for defined land units and risk of meteorological variation and its crop effects determined on basis of experience and guidelines written Preparation of Kinyarwanda manuals for crop/variety environmental compatibility and meteorological risk for all defined land units Farmers trained on crop/variety selection, including consideration of climate variability/change, so as to make informed choices	CIP needs to integrate principles of ICM (including nutrient management) and flexibility for climate change adaptation Farmers are to be trained so they may make best of CIP and make informed choices on farming
			Environmental screening of distributors, personnel, premises and handling in	

			relation to agrochemicals	
			Review of agrochemical products manufacturers' instructions suitability for local conditions, and translation (Kinyarwanda)	
			Document results of previous work on efficacy and efficiency of P&D trials in CIP stable and other crops	Including associated residue analysis in products, soil and water
			Develop manuals for agrochemicals' safe dosages frequency, handling systems, disposal, economic application measures, equipping/protective clothing, pre-harvest intervals, risk	
			P&D certification of public and private extension staff	Including ToT of public and private extension staff; respective (pesticide use) certification
			Spot checking, detection and quantification of residues throughout the food chain	
Sub-programme 1.5 Supply and use of agricultural inputs: certified seeds and other inputs				
Increased use of improved seeds	EDPRS			In the SEA report MINIRENA is asked to emphasise protection of agro-biodiversity, which may be further endangered by increase in use of improved seeds
Increased use of farm mechanisation			Farm mechanisation strategy to incorporate elements of conservation agriculture	This activity is not highlighted in the core text of the report, but poses an opportunity which already appears in the draft report for the mechanisation strategy
Increased use of animal traction				
Sub-programme 1.6 Food security and vulnerability Management				
Early warning capability for food shortages		% coverage of EWS (NSCCLCD indicator – to be integrated)	Fully develop EWS	Activity to be undertaken in coordination with Meteo Rwanda
		No. farmers under CIP with weather insurance coverage	Weather insurance to be promoted in all land under CIP Promoted beyond CIP as well	
Programme 3. Promotion of commodity chains and agribusiness development				

Sub-programme 3.2 Development of traditional exports: coffee				
Improved performance of coffee washing stations	CPAF: water quality			Not identified as priority area, but MINAGRI should ensure washing stations treat wastewaters to standard
Sub-programme 3.5 Market-oriented rural infrastructure				
All-weather roads to priority production areas	**VISION 2020; EDPRS;**	POSSIBILITY: KM OF RFR BUILT UP IN COMPLIANCE WITH ENVIRONMENTAL STANDARDS AND CLIMATE PROOFING BUILT INTO DESIGN	Ensure adequate environmental standards are adopted, including climate-proofing	See details of recommendations in Issue T5 of main report. Coordination with RTDA required
Programme 4. Institutional development				
Sub-programme 4.4 M&E systems and coordination of the agricultural sector				
Results indicators reviewed and refined as necessary and baseline developed where needed			Harmonise environment-agriculture indicators between all relevant government institutions	Close coordination with MINIRENA and RNRA
			Develop adequate methodologies for all harmonised indicators (environment-agriculture)	
Self-reporting monitoring system developed			Develop M&E framework and provisions (including methodologies) for SPTA3	

14.2 Recommendations for non-agriculture sector institutions

Important opportunities were identified to enhance the environmental performance of the agriculture sector that are best addressed by institutional actors outside the agriculture sector. These relate mainly to environmental policy and management, in the hands of the competent environmental authorities, but also to issues that should be addressed by actors such as the RMS, RBS, MINECOFIN, MINALOC and Districts.

This section presents a summary of the recommendations that are addressed to non-agricultural institutional actors.

MINIRENA and RNRA

- Being the government institution in charge of environmental policy aspects, and also responsible for implementing and monitoring the ENRSSP, MINIRENA should play a key role in coordinating with MINAGRI in all matters related to the environmental dimensions of SPTA3. Existing fora can be used for these ends, such as the ENR and the agriculture SWGs. [reinforced/increased – high priority]
- MINIRENA, together with the RNRA, should take primary responsibility for the development of an indicator measuring soil erosion, which will be key to monitor the effectiveness and, (especially) impact of soil erosion control measures. MINAGRI would have to contribute with the component

dealing with soil erosion from arable land, but MINIRENA/RNRA would deal with the overall measure. [reinforced/increased – medium priority]

- RNRA is already developing the system for monitoring of water quality. They should ensure that variables that give an indirect measure of soil erosion are included (i.e. TSS, TDS, turbidity). [reinforced/increased – medium priority]
- In terms of water use efficiency, the water balance study in charge of MINIRENA will be fundamental to determine availability of resources. Setting up the mechanism of water use allocations will be important to ensure good management of resources in the context of increasing water demand and climate change. [reinforced/increased – high priority]
- RNRA, with the possible support of NUR, should take in charge the regular monitoring of surface and groundwater quality to check for fertiliser and pesticide residues. [reinforced/increased – medium priority]
- MINIRENA should revisit the National Biodiversity Strategy, and devise appropriate measures (in coordination with MINAGRI) for the protection of agro-biodiversity, which is potentially imperilled by the CIP, and which is important also in terms of climate change adaptation. An associated indicator would be useful in this context, to be considered for the revised ENRSSP. [reinforced/increased – medium priority]

REMA and RDB (as implementation agent of REMA)

- The enhancement of the EIA system is fundamental to guarantee the environmental sustainability of agriculture sector development projects, especially with regards to the adequate implementation of EMPs and the strengthening of REMA's enforcement capacities. This exercise should include the integration of climate change considerations where and as appropriate.
- Although REMA has wished to assert that the deployment of environmental inspectors/monitors in each of the 30 districts has been arranged, also that capacity strengthening will ensure success in their effectiveness, it is recommended that REMA carry out measures at the headquarters level to strengthen the EIA system itself, based on the effectiveness assessment done by REMA and more particularly based on the gaps in enforcement (on operators) identified in this report. [reinforced/increased – high priority]
- The EIA regulatory framework, including the EIA Guidelines, are well developed and powerful instruments; REMA and RDB should make better use of them. In particular the indication – in the EIA Certificates – that developers should submit annual monitoring reports to REMA will strengthen REMA's enforcement capacities, and also put more pressure for compliance on developers. [reinforced/increased – high priority]
- REMA, in coordination with MINIRENA, should clarify who is considered to be the 'developer' (for purposes of monitoring, reporting and for all other legal ends) in the case of long-term operation of agricultural projects (e.g. rice field development/irrigation system handed over by donor-funded project to a farmers cooperative). [reinforced/increased – high priority]

MINALOC and Districts

- Districts will play a very important role in the implementation of most recommendations, normally in coordination with MINAGRI/RAB. Especially important, they should take a leading role in training of farmers, with a view to empower farmers to be able to make informed decisions on best farming practices. [reinforced/increased – high priority]
- MINALOC, in coordination with Districts should take a leading role in measures aimed at enhancing local capacities, including the clarification of job descriptions for agronomists and

infrastructure officials and providing the necessary training. In some organograms will have to change to incorporate new structures and hire new personnel (e.g. Sector Infrastructure and Land Officers). Freeing up agronomists from non-agricultural and ENR functions will be key to enhance local capacities for environment-agriculture. [introduced for the first time – top priority]

- MINALOC is recommended to consider ways to enhance local capacities, including with regards to reducing the high levels of staff turnover. [reinforced/increased – top priority]
- MINALOC should be able to contribute significantly, in coordination with MINECOFIN (and other sector line ministries) to define a harmonised reporting framework for the M&E system, whereas the data/information MINALOC collects from the local level can be easily accessible to MINAGRI and MINIRENA. [reinforced/increased – high priority]

Rwanda Bureau of Standards (RBS)

- RBS is to play an important role in setting up an adequate framework for the safe management of pesticides, including aspects of product standards, labelling, residues analyses. As earlier stressed, REMA's CCIOU needs to take an active part in monitoring and verifying that framework implementation is not only sound but also meets international obligations. [reinforced/increased – high priority]

Ministry of Health (MOH)

- The MOH should take an interest in the spot-checking, detection and quantification of pesticide residues in user blood samples. This is important to verify adequacy of the framework established for safe management of agrochemical products. [reinforced/increased – medium priority]

Rwanda Transport Development Authority (RTDA)

- Most recommendations to the RFR sub-sector are addressed to the RTDA. These concern especially the adoption of the necessary environmental standards, training of key actors in good environmental management practices, and contribution (in coordination with Districts) to create the job description for the new post of Infrastructure and Land Officer at the local level.

14.3 Recommendations for enhancement of EDPRS2

The EDPRS is a critical policy document, as all sector and local government strategies have to contribute to it. In this sense the focus, indicators and targets defined in the EDPRS are of fundamental importance, as they permeate all levels of strategic planning and implementation.

Being of utter importance for national development, and the main economic sector, agriculture figures prominently in the EDPRS. The increase of agricultural productivity is a key goal under its Flagship Programme 1 on "sustainable growth for jobs and exports".

Through a simple discourse analysis of the document, it is discerned that, when it comes to the agriculture sector, the implicit policy statement runs along the following lines: *'agricultural productivity has to be enhanced through a significant use of fertilisers (especially inorganic)'*. This is reflected particularly in the selection of EDPRS indicators. Amongst the 'intermediate indicators' (which are meant to be useful to link to SBS) the following indicators are defined: "% of farm households using: inorganic mineral fertilisers; organic fertilisers; improved seeds; insecticides", with associated targets. This is further highlighted by the fact that the Rwanda Vision 2020 includes an indicator on *'use of fertilisers (kg/ha/yr)'*.

As discussed under Technical Issue T2 above, although it is certainly true that increased use of inorganic fertilisers are necessary in Rwanda to increase agricultural productivity, from an environmental sustainability and climate change point of view, it is important to ensure fertilisers are optimally applied, based on the soil's specific nutrient needs for the particular crop(s) in question.

A key recommendation for the preparation of EDPRS is to shift the policy focus from increasing the amount of inorganic fertilisers applied, to one of increasing the amount of inorganic fertilisers applied AND that such application responds to soil nutrient needs. This will also help in the integration of the Programme 1 of the National Strategy for Climate Change and Low Carbon Development (2011), which aims for rational use of fertilisers.

Secondly from the time the EDPRS was written, the institutional level of awareness on climate change, and the corresponding policy focus, have matured; climate change adaptation is now rightly recognised as an important aspect to address, especially due to the high level of vulnerability to climate change of the agriculture sector.

This SEA has shed light on important opportunities available to improve the environmental dimension of the agricultural sector. Although all recommended actions are considered important, some specific actions deserve special attention due to their particular potential to contribute significantly to increase the environmental performance of the agriculture sector in Rwanda. These deserve to be highlighted in the EDPRS2 'policy actions matrix', especially as these actions are meant to serve as triggers for the release of budget support funds.

Three key recommendations for enhancement of the environmental dimension of the EDPRS with regards to the agriculture sector are synthesised below.

Table 12 Key recommendations for EDPRS2

1	Modify the indicator on intensity of use of fertilisers (in the intermediate indicators matrix), to one that clearly reflects the optimisation in its use. An appropriate measuring methodology should be developed. Some possible formulations to consider are: • 'number of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit'; • 'tonnes of inorganic fertilisers/ha/yr applied based on estimation of soil nutrient needs'; and/or • '% of total inorganic fertilisers applied whose application is based on estimation of soil nutrient needs'.
2	Make explicit reference in the SPTA3 document to the vulnerability of the agriculture sector to climate change, and the importance of adaptation.
3	Integrate, as part of the 'policy actions matrix', the following: • Develop and implement a purpose-based agro-forestry strategy; • Develop SPTA3 in line with recommendations made in the Strategic Environmental Assessment (SEA) of the agriculture sector in Rwanda.

14.4 Recommendations for the CPAF

The Common Performance Assessment Framework (CPAF) contains a subset of sector strategy and EDPRS indicators, which are agreed by all key stakeholders to represent the key variables that measure performance of a sector, and which are followed through the respective SWGs. The number of indicators contained in the CPAF is therefore only a fraction of those used in the EDPRS and SPTA frameworks.

Currently the CPAF contains only the following three indicators relevant to the environment-agriculture interactions[2]: (1) *'land portion protected against soil erosion (%)'*; (2) *'% of farming households using improved farm methods'*; and (3) *'% of water resources complying with water quality standard'*.

The shortcomings of the first of these indicators have been acknowledged, and are discussed under issue T1 above. The third indicator is to be monitored by RNRA under the IWRMP. Both these indicators are welcome and necessary at the CPAF level.

As for the second indicator on up-take of improved farm methods, on examination of the methodology to measure the indicator, it is identified that 'improved farming methods' is related exclusively to the use of fertilisers (chemical and organic)[3].

As will be evident by the discussions provided under issue T2 above, the concept of 'improved farm methods' should be much wider than merely applying fertilisers; it should include the up-take of an Integrated Crop Management (ICM) approach, including aspects of up-take of agro-forestry and Integrated Pest Management (IPM). In any case, the use of fertilisers should be matched to the soil nutrient needs after any necessary correction of acidity.

A re-defined methodology for *'% of farming households using improved farm methods'* will not be provided here, as it will require further discussions amongst the agriculture SWAp community. However it is important that the aspects highlighted in the above paragraph are taken into account, especially the rational use of fertilisers. One possible compound formulation is: 'farming households that make use of soil acidity correction measures and fertilisers based on the assessment of soil nutrient needs, and which engage in IPM".

In addition, or as a complement, to the above indicators, it is recommended that the following indicators be integrated into the CPAF[4] (for a brief description of the rationale behind each indicator, see Section 15.1 below)[5]:

- No. of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit;
- ha of arable land under agro-forestry;
- No. of farmers exposed to Farmer Field Schools, with an ICM focus;
- No. of Districts where Infrastructure and Land Officers are functional (relieving agronomists of those functions);
- % of cultivated land under CIP with weather insurance.

The Table below synthesises the main indicators suggested for EDPRS2, CPAF and SPTA3. The indicators referred to for SPTA3 are only indicative, based on the activities suggested in this SEA report (NB: they may not be explicitly suggested as indicators in Sections 5-13 although, if actions are integrated into SPTA3, associated indicators would probably assume a wording similar to what is suggested in this table). The SPTA3 document will certainly include a broader range of indicators.

Table 12 Synthesis of suggested indicators for EDPRS2, CPAF and SPTA3

Proposed Indicators	EDPRS2	CPAF	SPTA3
• No. of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit; AND/OR • Tonnes of inorganic fertilisers/ha/yr applied based on estimation of soil nutrient needs; AND/OR • % of total inorganic fertilisers applied whose application is based on estimation of soil nutrient needs.	✓	✓	✓
Policy action: • Develop and implement a purpose-based agro-forestry strategy	✓		✓
Policy action: • Develop SPTA3 in line with recommendations made in the SEA of the agriculture sector in Rwanda	✓		
• ha of arable land under agro-forestry		✓	✓
• No. of farmers exposed to FFSs, with an ICM focus		✓	✓
• No. of districts where Infrastructure and Land Officers are functional (relieving agronomists of those functions)		✓	✓
• % of cultivated land under CIP with weather insurance		✓	✓
Policy action: • Devise and adopt Soil and Water Conservation Strategy			✓
Policy action: • Devise and adopt National awareness programme (farmers' awareness of benefits of soil and water conservation measures)			✓
• No. of extensionists trained on purpose-based agro-forestry			✓
• Water use efficiency for irrigation (Mm^3/ha/yr or Mm^3/t/yr)			✓
• No. of acidity correction trials completed for major land units			✓
• No. of nutrient management trials completed for staple crops in major land units			✓
• No. of extension workers including ToR and FFS trainers inducted into and tested for knowledge on acidity control and nutrient management			✓
• % coverage of early warning system			✓

• No. of crops for which IPM/Pest Risk Analysis protocols, field scouting frequencies and roguing practices are completed			✓
• No. of crops for which manuals on OPM/PRA have been developed			✓
• No. of farmers trained on climate change awareness			✓
• Indicators (as yet undefined) measuring protection of agro-biodiversity			✓
• % farming households covered by weather-related crop failure insurance policy			✓
Indicators proposed to be WITHDRAWN/MODIFIED	**EDPRS2**	**CPAF**	**SPTA3**
• % of farm households using inorganic mineral fertilisers	✓		✓
• % of farm households using organic fertilisers	✓		✓
• % of farm households using insecticides	✓		✓
• % of farming households using improved farm methods (definition of 'improved farm methods' to be modified)		✓	
• land portion protected against soil erosion (%) (measurement methodology to be modified so it reflects 'effective protection' and monitoring data can be comparable across the country)		✓	✓

15 Recommendations to the European Commission

15.1 Recommendations in the context of the SBS to the agriculture sector

The EC has committed a 20M€ top-up to its SBS for Decentralised Agriculture through an Action Fiche of October 2011, reaching a total commitment of 40M€, and adding an additional 3 years to the programme. Recommendations are provided above on how GoR institutions can enhance the environmental performance of the agriculture sector in the design of SPTA3 and EDPRS2 in particular. The EC has mainly two instruments to enhance the environmental performance of the agriculture sector through its SBS:

(1) making sure that critical environmental indicators are integrated in the SBS performance indicators, as variable tranche indicators and targets;

(2) addressing environmental concerns through the on-going policy dialogue.

General conditions for disbursement of tranches

The general conditions for disbursement of all tranches are linked to a set of general eligibility conditions. From the point of view of adequacy of the sector policy (in this case the SPTA), it is necessary that it is environmentally sustainable. When re-assessing for future disbursement the appropriateness of the sector policy, budget, monitoring systems, sector coordination and institutional capacities, the implementation of the recommendations drawn by the present Strategic Environmental Assessment (SEA) should be taken into account.

Performance Indicators for the disbursement of variable tranches

The most pressing environmental concerns in the agriculture sector should be reflected either in the performance indicators for the disbursement of variable tranches or at least be present amongst the issues to be raised in the on-going policy dialogue. It is recommended that the EC, within the context of the SBS Programme, gives special emphasis towards the following six indicators. The rationale is given in the right column.

Table 13 Priority agro-environmental performance indicators for SBS to the agriculture sector in Rwanda

Performance Indicator	Associated Key Issue	Rationale
1 No. of farmers using acidity correction and fertiliser application based on nutrient needs assessment for their specific land unit	T2	Intensity of inorganic fertiliser application is used as a key 'pressure' indicator for sector performance (e.g. in EDPRS), but is not consistent with principles of environmental sustainability. Fertiliser use has to be optimised, for which it must respond to determined nutrient needs, after acidity correction where necessary. This approach is also necessary for correct implementation of the NSCCLCD.
2 ha of arable land under agro-forestry	T1	Agro-forestry can play a critical role in soil erosion prevention and water conservation – necessary for optimised agricultural productivity and climate change adaptation. As well it can provide fertility enhancement (from leguminous species), fuel wood, horticultural poles, construction materials, fodder, fruits, seeds, etc., contribute to increase of the permanent forested area and to mitigation of climate change. Agroforestry has been promoted, but not integrated in extension (CIP, etc.) to the extent desirable.
3 No. of farmers exposed to Farmer Field Schools, with an ICM focus (Issue T4, SO1, Result 3)	T1; T2; T3; T4 (SO1); S4	Empowerment of farmers to make informed decisions on aspects of ICM (including soil and water conservation measures, acidity control and nutrient management, pest & disease management, selection of crops and varieties, and adaptation to climate variability and climate change) must be accelerated and promoted nationwide. Farmers are the end-of-the-line implementers, and thus the development of their capacities for optimum resource use and optimum output is critical; this also has important national economic consequences
4 Law of Agrochemicals enacted and Registrar of agro-chemicals and inspection team functional	T4 (SO2)	So that necessary use of permitted agro-chemicals is optimised for safety and efficiency, the EU needs to support this important and carefully framed MINAGRI initiative in which MINAGRI has taken full ownership
5 No. of Sectors where Infrastructure and Land Officers are functional (relieving Sector Agronomists of those functions)	S4	In context of decentralisation Sector Agronomists are critical to ensure proper implementation of agricultural and environmental strategies and policies. They are overburdened with multiple responsibilities, which do not allow them to focus properly on agriculture and environment functions. This indicator is highly important to ensure enhancement of sustainable decentralised agriculture.
6 % of cultivated land under CIP with weather insurance	S3	CIP has produced important results in improving yields; in some Districts it is matched by the weather insurance scheme. In its present form CIP limits the opportunities for adaptation to climate variability and climate change. Weather insurance is an important adaptation measure, which should be extended to all farmers engaged in the CIP. Existing CIP farm inputs supply administration can facilitate insurance set-up.

Policy dialogue

There are some recommendations which are necessary to enhance the environmental performance of the agriculture sector, but which are beyond the sole responsibilities of the agricultural institutions. For this reason they have not been included in the aforementioned list of top priority agro-environmental performance indicators, but they should indeed be pursued in the wider policy dialogue of the EC and other Development Partners in Rwanda. Those issues should include, *inter alia*:

1. Harmonisation of environmental indicators relevant to the agriculture sector.
    a. Different strategies define environmental indicators relevant to the agriculture sector (e.g. SPTA, ENRSSP, NSCCLCD, National Biodiversity Strategy). For a well-functioning M&E system, these indicators must be harmonised, including their associated methodologies. MINAGRI should take a leading role.
2. No. of annual monitoring reports submitted to REMA in context of EMP implementation
    a. Reporting of self-monitoring associated to EMPs is provided for in the EIA Guidelines, and a powerful tool to enhance REMA's enforcement capacities and put pressure on developers for compliance with EMPs and environmental regulations in general. REMA and RDB should be leading actors for this issue.
3. Development of a common ICT platform for M&E enabling effective computer access by all relevant Government institutions to M&E data and information under common formats.
    a. Possibly to be coordinated by MINECOFIN, with close involvement of all line ministries and Districts.

The EC is nevertheless encouraged to familiarise with the corpus of recommendations made for all technical and systemic issues, so they may be addressed through the policy dialogue whenever adequate opportunities arise to do so. These include aspects related to, *inter alia*, the Early Warning System (EWS), water quality monitoring, Integrated Pest Management (IPM), etc.

The draft AF for the SBS top-up included two expected results related to soil erosion protection, and which are necessary:

R3: The protection of cultivable land against soil erosion has been supported country-wide; and

R4: The methodological approach for soil erosion and soil protection assessments has been revised.

Results R3 is addressed by Indicator 2 above related to issue T1; R4 is addressed in the detail of the actions proposed under T1 and should remain in the AF matrix.

Due to the importance being given to the amounts of fertilisers used as a key measure of input performance in the agriculture sector[1], and that such an approach (alone) is incompatible with principles of environmental sustainability and incongruent with the principles advocated in the NSCCLCD, it is necessary that the GoR modifies its approach to one of rational use of fertilisers. A similar approach is taken by this study for pesticides[2].

The recommendations for any EU participation/policy dialogue in formulation of EDPRS include changing the approach which should be reflect the following principle:

The indicators to measure use of fertilisers and pesticides reflect their rational use .

15.2 Recommendations in the context of the SPSP to rural feeder roads

Dialogue was established by with the formulation team for RFR SPSP, with the Ministry of Infrastructure (MININFRA) and the Rwanda Transport Development Agency (RTDA). Preliminary recommendations for integration of environment into the draft documentation offered for RFR SPSP formulation were provided to the RFR SPSP formulation team as follows based on the agreed condition of no significant change to the RFR carriageway width recommended as standard (+/- 4 metres):

1. *The Code of Practice and actual management systems of A) Supervising Engineers and B) Road Rehabilitation and Maintenance Contractors would need to incorporate Environmental Capability including capability related to the issues set out at II and III below – should be a requirement;*
2. *The adopted Road Standard(s) would have to incorporate rigorous guidance and specifications for Vegetative Protection of Water Courses, Verges, Embankments and Cuttings and other earthen structures associated with RFR rehabilitation and maintenance, according to soil type and other geological and hydrological considerations – should be a requirement;*
3. *Minimum road specifications applied to the respective implementation should require climate-proofing road design, so that roads and associated structures would be capable of sustaining greater intensity of rainfall as indicated by officially recorded trends.*

The European Commission is encouraged to take on board these recommendations in the formulation of the RFR SPSP.

Bibliography and references

Baechler, G. (1999) *Violence through environmental discrimination: Causes, Rwanda Arena and Conflict Model*. Kluwer Academic Publishers.

Byamukama, B; Carey, C; Cole, M; Dyszynski, J; and Warnest, M (2011) *National Strategy on Climate Change and Low Carbon Development for Rwanda – Baseline Report*. University of Oxford, Smith School of Enterprise and the Environment.

Byers, AC (1990) *Preliminary results of the RRAM Project soil loss and erosion control trials Rwanda, 1987-1988*. Proceedings of the International Symposium: Research Needs and Applications to Reduce Erosion and Sedimentation in Tropical Steeplands. IAHS-AISH Publication No. 192. International Association of Hydrological Sciences. Fiji.

Cantore, N (2010) *The Crop Intensification Program in Rwanda: a sustainability analysis*. Overseas Development Institute (ODI).

Chapman, N (2011) *Review of M&E Arrangements for Rwanda's Agricultural Sector Support, Draft Report*.

Clay, D; Kelly, V; Mpyisi, E; and Reardon, T (nd) *Input use and conservation investments among farm households in Rwanda: patterns and determinants*.

Clay, D and Lewis (1996) *Land use, soil loss and sustainable agriculture in Rwanda*. Michigan: MSU/MINAGRI Papers.

de la Paix, MJ; Ge, J; Habiyaremya, G; Mukakayumba, UA (2009) Impact of radical terraces on Rwanda environment: case of Kaniga sector, *International Journal of Sustainability Science and Studies*, **1**(1): 67-72.

Dinar, A; Hassan, R; Mendelsohn, and Benhim, J (2008) *Climate Change and Agriculture in Africa, Impact Assessment and Adaptation Strategies*. Earthscan: London.

Dyszynski, J; Watkiss, P and Brooks,N (2011) *Climate Change Strategic Evaluation of the DFID Rwanda Programme, Draft Report to DFID Rwanda*.

Eco-Excellence Consultancy Ltd. (2011) *Livestock Infrastructure Support Programme (LISP) Strategic Environmental Assessment*. Prepared by P. Kabanda, Kigali, Rwanda.

Environment and Natural Resources Sector Working Group (2010) *Backward-Looking Joint Sector Review FY 2009/10*.

European Commission (2009) *Guidelines on the Integration of Environment and Climate Change in Development Cooperation*. EC Tools and Methods Series Guidelines No. 4.

European Commission (2009) *EC Cooperation: Responding to climate change. Sector Script for Agriculture & Rural Development, Information Note*.

Hydroplan Ingenieur GmbH and SHER Ingénieurs-Conseils s.a. (nd) *Schéma Directeur d'Aménagement des Marais, de protection des Bassins Versants et de Conservation des Sols. Rapport de synthèse, Version definitive*.

Hydroplan Ingenieur GmbH and SHER Ingénieurs-Conseils s.a. (2002) *Schéma Directeur d'Aménagement des Marais, de protection des Bassins Versants et de Conservation des Sols. Rapport global definitive phase 1 Annexe 3 Etude environnementale*.

Hydroplan Ingenieur GmbH and SHER Ingénieurs-Conseils s.a. (2002) *Schéma Directeur d'Aménagement des Marais, de protection des Bassins Versants et de Conservation des Sols. Rapport global definitive phase 1 Annexe 6 Schéma d'aménagement de marais*.

IFAD (2011) *Implementation Support Report of the International Fund for Agricultural Development. Kirehe Community-Based Watershed Management Project (KWAMP)*. IFAD Report 2405-RW.

International Trade Centre (2008) *Overview of organic agriculture in Rwanda and options for policy and trade development*.

Kalisa, J. (nd) *The effects of climate change in Rwandan region.*

Keller, G and Sherar, J. (2003) *Low-Volume Roads Engineering, Best Management Practices Field Guide*. Produced for USAID.

Kelly, V; Mpyisi, E; Shingiro, E and Nyarwaya, JB. (2001) *Agricultural Intensification in Rwanda: an elusive goal. Fertilizer use and conservation investments*. Prepared for MINAGRI. FRRP/DSA Policy Brief.

MIFOTRA/HIDA (2008) *Mapping of ongoing and planned capacity building activities in Rwanda, final report*. UNDP.

MINAGRI (2008) *Supporting Fiscal Decentralisation in the Agricultural Sector, Developing guidelines and a training manual for utilisation of earmarked grants to districts. Mission report with (i) assessment of the present situation and issues that need resolution and (ii) drat outline LG planning and budgeting manual for agriculture*. Prepared by ETC East Africa Ltd, and in collaboration with MINALOC and MINECOFIN.

MINAGRI (2009) *Strategic Plan for the Transformation of Agriculture in Rwanda – Phase II (PSTA II) final report.*

MINAGRI (2010) *Agriculture Sector Performance report Fiscal Year 2009/2010, Sector Evaluation Report for the Joint Agriculture Sector Review for the Financial Year 2009/2010*.

MINAGRI (2010) *Crop Intensification Program (2008-2009) Evaluation Report*. Prepared by IFDC.

MINAGRI (2010) *Agricultural Mechanization Strategies for Rwanda, shifting from subsistence agriculture to market-oriented agriculture*. Prepared by A. Kathiresan.

MINAGRI (2011) S*ector Evaluation Report for the Joint Sector Review FY 2010/2011*.

MINAGRI (2011) *Practical Guidelines for the establishment of farmer field school (FFS) programme for Rwandan conditions*.

MINAGRI (2011) *Crop Assessment 2011A Season: crop area, yield and production – draft report.*

MINAGRI (2011) *EDPRS Self-Assessment*. December, 2011.

MINAGRI (2011) *Strategic capacity building initiative*. Powerpoint presentation.

MINALOC (2006) *Strategy for developing capacity for effective decentralised governance and local level service delivery in Rwanda.*

MINALOC and MIFOTRA (2008) *District Capacity Building Needs Assessment and Planning, draft findings and recommendations*. Dfid, Adam Smith International.

MINECOFIN (2009) *EDPRS Goals and Achievements*. Kigali.

MINECOFIN (2011) *2011-12 Districts' Earmarked Transfers Guidelines*.

Ministry of Environment and Lands (2010) *Action Plan for the Ministry of Environment and Lands (MINELA) July 2010 – June 2011.*

Ministry of Natural Resources (2008) *Etablissement d'un inventaire national rapide des marais et elaboration de 5 avant-projets d'arrêtés ministériels relatifs aux marais, Module 3 Rapport* Final. Projet de Gestion Integree des Ecosystems Critiques (MINIRENA-REMA-IMCE).

Musahara, H (2006) *Improving Tenure Security for the Rural Poor Rwanda – Country Case Study*. Legal Empowerment of the Poor (LEP). Food and Agriculture Organisation (FAO) of the United Nations.

National Institute of Statistics of Rwanda (2008) *Metadata CPAF indicators.*

National Institute of Statistics of Rwanda (2009) *Statistical Yearbook 2009 Edition.*

National Institute of Statistics of Rwanda (2010) *National Agricultural Survey 2008 (NAS 2008).*

National Institute of Statistics of Rwanda (2009) *National Population Projection 2007-2022.*

NUR (2002) *Les polluants des eaux du Rwanda et leu impact sur l'environnement sous regional*. Commission de recherché de l'Université Nationale du Rwanda (NUR), Kigali.

OECD DAC (2006) *Applying Strategic Environmental Assessment, Good Practice Guidance for Development Co-operation*. OECD DAC Guidelines and Reference Series, Paris.

Oruko, L; Randall, I; Bwalya, M; Kisira, S; and Wanzala, M (2011) *Mutual Accountability Framework for the Comprehensive Africa Agriculture Development Programme*. NEPAD, African Union.

RALGA (2010) *Challenges facing local governments in Rwanda, A study report*. Kigali, Rwanda.

RALGA (2010) *Factors affecting service delivery in local governments, A study report*.

REMA (nd) *Economic Analysis of Natural Resources Management in Rwanda*. Supported by the PEI.

REMA (2009) *State of Environment and Outlook Report 2009*.

REMA (2010) *Public Environmental Expenditure Review to support Poverty Environment Initiative in Rwanda*. UNDP, UNEP.

REMA (2010) *A review of existing and potential environmental fiscal reforms and other economic instruments in Rwanda*. REMA supported by Poverty Environment Initiative (PEI), UNDP, UNEP.

REMA (2011a) *Rwanda Environmental Indicators. Validation Workshop Report, Umubano Hotel Kigali 6th December 2011*.

REMA (2011b) *General Guidelines and Procedures for Strategic Environmental Assessment (SEA).*

Rwanda SAKSS (2011) *Rwanda Trends and Outlook Report 2010*.

Stockholm Environment Institute (2009) *Economics of Climate Change in Rwanda.*

Twagiramungu, F (2006) *Environmental Profile of Rwanda*. European Commission and Government of Rwanda.

UKAID (2011) *Rwanda Agriculture Sector Delivery Grant 2011/12 to 2014/15 Business Case*. DFID, 1 November, 2011.

UNEP (2011) *Rwanda – From Post-Conflict to Environmentally Sustainable Development*.

USAID (2010) *Assessment of Post-Harvest Opportunities in Rwanda, USAID Post-Harvest Handling and Storage Project (PHHS).*

USAID (2011) *Rwanda Feeder Roads Improvement Program. Scoping Statement – Feeder Roads Improvement Programmatic Environmental Assessment (PEA)*. Prepared by T. Catterson, IRG/Parsons.

Van't Klooster, K; Smet, J and Kente, L (2011) *Scoping Mission on Water in Rwanda, the Rwandan Water Scan*. Draft report for the Embassy of the Kingdom of the Netherlands in Rwanda, mission period: 10-16 August, 2011.

World Bank (2011) *Developing sustainable public sector capacity and performance for Rwanda's growth and competitiveness: key issues, challenges and recommendations. A study based on case studies of the agriculture and energy sectors. Draft report*.

[1] According to NISR (2008).

[2] *"Improved farming methods refer to the use of chemical as well as organic fertilisers"* (NISR, 2008).

Notes to Chapter 1: Introduction

[1] SPTA2 document (2009).

Notes to Chapter 2: Approach and methodology

[1] REMA-deployed person for environmental mainstreaming in MINAGRI, Ms Madeleine Usabyembabazi, was part of all field missions.

[2] Ms Annette Sylvie was nominated as the focal point within MINAGRI for this SEA.

Notes to Chapter 4: Policy, institutional and regulatory framework

[1] A more detailed account of the policy, institutional and regulatory framework is provided in Annex A4.

[2] Support to environmental mainstreaming is provided under the UN Poverty-Environment Initiative (PEI):

[3] Mayors are also members of the District Council, as well as head of the District Executive Committee (composed of a Mayor and two Vice-Mayors in each District and the City of Kigali).

[4] The higher-level environmental objectives for the agriculture sector are: (1) ensure a sustainable use of marshland; (2) promote improved soil and water conservation practices; and (3) restore and improve soil fertility and prudent use of agricultural inputs.

Notes to Chapter 5: Technical issue 1 (soil and water conservation)

[1] Additional details on soil erosion are found in Annex B5.1.

[2] Soil erosion leads to other impacts besides reduced agricultural productivity. These include, *inter alia*, increase of sedimentation downhill-cultivated lands from eroded plots; risk of crop destruction and silting-up in marshes and plains; risk of local landslides and mudslides; and risk of irreversible leaching of soils (Twagiramungu, 2006). Most of the soil loss ends up in river and stream networks and marshlands (Musahara, 2006). Research cited in the SPTA2 document provides some quantitative data: the Nyabarongo river system carried 51 kg/sec of soil at Nyabarango-Kigali, 44 kg/sec at Nyabarongo-Kanzenze and 26 kg/sec at Akagera-Rusomo. Unfortunately systematic monitoring of sediment load in the river and stream systems is not yet available.

[3] 'Agroforestry is a collective name for land-use systems and technologies, where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land management unit as agricultural crops and/or animals, either in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components'. (ICRAF, 1993)

[4] Short-term trials have indicated that agroforestry can reduce soil erosion by up to 90% (Byers, 1990 quoted in UNEP, 2011).

[5] Organic Law N° 04/2005.

[6] Law N° 62/2008 of 10/09/2008 putting in place the use, conservation, protection and management of water resources regulations.

[7] Nevertheless Law 62/2008 established some basic principles and responsibilities for water management relevant to the agriculture sector, including: (a) calls for establishment, in the PM's office of a Water Inter-ministerial Committee; (b) devolves water resources management functions to the district level and user organisations. In this regards it: calls for the establishment of a Basin District Committee. A basin committee at the sector level is also to be established, with structure and functions similar to the equivalent committee at the district level, on the basis of a local master plan. It allows for the constitution of water users associations, to deal with issues of management,

enhancement of production and protection of water resources and fight against flooding; (c) calls for the establishment (at Ministerial level) of a national water inventory, as well as a national water master plan; (d) provides for charges to be levied on water use; (e) establishes that installations and activities relative to water use that may impact water quantity or quality, or affect wetlands, are subject to authorisations at the Ministerial level; (f) calls for the Minister to maintain and update an inventory of wetlands, indicating their location and features, especially those with a protection status.

[8] Other provisions include: to monitor and assess water resources to identify its spatial and temporal occurrence and distribution in the country with a special focus on areas vulnerable to water related disasters, including droughts and floods; to develop a water resources information system; and to formulate water quality standards and legal limits for discharges of effluent into natural water courses.

[9] We have a densely populated country where land is limited and thus intensively farmed, with very limited fallowing. Adding to this a large portion of the territory is hilly terrain (46% greater than 16% slope; 7% greater than 40% slope) which is being farmed (farming can be found in gradients of up to and above 55%); soils are especially fragile in the Northern and Western uplands that experience high rainfall (>1400mm); the rainy seasons often see periods of intense rainfall. All these factors have contributed to Rwanda being one of the countries in Africa experiencing heavy soil losses (REMA, 2009).

According to the 2010 Forestry Policy, natural forest areas have declined by 65% in the 1960-2007 period and the distribution of the remaining forest resources is uneven over the country (concentrating along the Congo-Nile Ridge). However at the moment a comprehensive forest inventory has not been produced, so it is not possible to provide more accurate estimates of forest cover.

Deforestation has a direct incidence on soil erosion. The main cause of deforestation is the collection of wood for energy (either fuel wood or for production of charcoal), as wood is the main source of energy for most (96%) of the population in Rwanda. Deforestation poses a major challenge for the forestry sector, which must be tackled from multiple fronts (e.g. energy policy, agriculture policy): the Forestry Policy document estimates that "in order to fill the gap between demand and supply of wood, it will require planting additional 400,000 ha and increasing the forest productivity up to an average of 15 m^3/ha/yr"; however such land is not available in Rwanda and the current productivity is very low.

The war and genocide resulted in the displacement of thousands of Rwandans and in the abandoning and destruction of erosion control structures; also, the massive return of refugees led to the systematic destruction of wooded areas and a take-over of protected zones (mainly the Akagera National Park and the Gishwati natural reserve) (Ministry of Lands, Environment, Forests, Water and Mines, 2004). The impact of the conflict and post-conflict situation over forest cover (and thus, on soil erosion) is deemed to be enormous, even if the extent of encroachment has largely been controled.

[10] Environmental Profile of Rwanda (2006). REMA/PEI (2006) refer to a loss of 14 million tonnes of soil per year. The SPTA2 document erroneously makes a reference to 1.4 million tonnes per year.

[11] This loss also corresponds to about 945,200 tonnes organic matter, 42,210 tonnes nitrogen, 280 tonnes phosphorous and 3,055 tonnes potassium.

[12] According to the OECD agri-environmental indicators, severe erosion is considered when >33 tonnes/ha/year. Annexes B5.1 and B5.2 provides more details on soil erosion per District.

[13] Data on turbidity from a 2002 study undertaken by the NUR[13]. Whereas the WHO standard is 5 FTU, only 1 out of 18 sample sites complied with the standard; of the rest, one exceeds the standard in 40%, 5 in between 500-1,000%, 8 in between 1,000-5,000% and 2 in more than 5,000%.

[14] The Agriculture JSR report synthesizes advances made under SPTA sub-programme on 'sustainable management of natural resources and water and soil preservation', which reflect advances based on the large projects managed by MINAGRI: for FY 2010/2011, 9336.52 ha of radical terraces and 22,128 ha of progressive terraces were constructed. Other soil protection control measures are also due mainly to efforts of NGOs such as Food for Work, World Vision, CRS and Care International (REMA, 2009).

[15] MINAGRI (2011) *Sector Evaluation Report for the Joint Sector Review FY 2010/2011*.

[16] The inattention given to the sustainability dimension is widely recognised by stakeholders, and also indicated in Chapman (2011).

[17] The ENRSSP includes an indicator on % of arable land under agro-forestry, but it is not being monitored.

[18] There are indications that mulching is being reduced, as fuel wood becomes increasingly scarce, and farmers begin using crop residues as fuel.

[19] It is foreseen that three automatic surface water quality stations will be installed on the Nyabugogo river near Kigali and Nyabarongo downstream of Kigali, for which it has been recommended that the sampling points for suspended sediments be located at the hydrometric stations (van't Klooster *et al*, 2011).

[20] van t'Klooster *et al* (2011).

[21] Other large schemes under development include Rusumo Falls (90MW) and Rusizi 3 (147MW), whilst at a later stage (Rusizi 4) another 300MW could be added (van't Klooster, 2011).

[22] National Policy for Water Resources Management (2011), p. 17.

[32] SPTA2 included a sub-programme (1.1) on "sustainable management of natural resources and water and soil conservation"; but is focused exclusively on resource-intensive erosion control structures (radical and progressive terraces), hillside irrigation and preparation of watershed management plans.

Notes to Chapter 6: Technical issue 2 (soil acidity and nutrient management)

[1] Regarding decentralisation, MINAGRI's recent EDPRS self-assessment concluded *"RAB Zones should be given responsibility to back-stop district authorities in both the development of District Development Plans (DDPs) and implementation of PSTA III."*

[2] The providers include ALUPA, IMBARAGA, Forrest Company and others.

[3] Pilot work of Gicumbi farm assistance programme reveals importance of discovery of trace element status in soil nutrient analysis, i.e. to support this SPTA 2 Sub-programme. Gicumbi relies on soil analysis abroad.

[4] According to an IFDC report (2010), out of the US $22.8 million CIP budget for 2009/2010, 79.67% and 16.38% were spent on the bulk purchase of, respectively, fertilizer and improved seeds, leaving 3.37% for (private) extension service providers and 0.31% for administrative costs.

[5] The NFS asserted the following. Priority Action 3: Stimulate the demand for fertilizer; Activity 3.3. Promote investments in lime as a key amendment, through organising and strengthening capacity of producers organisations in lime production, and establishing a mechanism to promote lime use.

[6] An illustrative delivered cost of limestone is RWF35,000/t or some RWF200,000/ha based on competitive tender. Application requires some 25 - 30 person-days/ha or about 5 persons/t, i.e. far more labour/ha than typically needed for ordinary inorganic fertiliser application.

[7] This may be compared with (depending upon crop) an average CIP fertiliser recommendation of 75-150kg of 'straight' nitrogen and/or compound (N:P:K) fertiliser/ha/crop costing (+/-RWF500/kg) some RWF115,000/ha/crop; on this measure lime accounts for 23% of the total material cost of 'optimum' fertility management.

[8] This is to be achieved through, a review existing recommendations; strengthening of ISAR (now RAB) technical and financial capacity; conducting participatory identification of bottlenecks, formulation of solutions, testing/adaptation and introduction of updated recommendations; and introducing and disseminate adapted recommendations.

[9] This Sub-programme includes the following elements: Participatory research activities established and supported; Farmers become more involved in establishing research agendas; Competitive research funding mechanism established; Strengthen ISAR's (RAB) capacity; and Increased adaptive research on varieties from the region. The respective Indicators/Quantities up to 2012 include: Six participatory research programmes established with farmer groups; Seven research stations are converted so that farmers have the main voice in establishing research agendas; Participation of ISAR (RAB) scientists in specialised training of extension agents in the new facility; and Participation of ISAR (RAB) scientists in fertiliser trials and participatory soil analysis activities.

Notes to Chapter 7: Technical issue 3 (crop and variety selection)

[1] In which relevant Sub-programmes of Action include: (1) mainstreaming of agro-ecology (indicator: % of farms up-taking agro-ecology technologies); (2) expansion of crop varieties (indicator: % of farms adopting crops); and (3) disaster management and disease prevention integrated early-warning system (indicator: % coverage of early warning system). Related climate variability/climate change aims under SPTA 2 and Agriculture SWG include: Early warning capability for food shortages; Weather insurance programme functioning; Plan for rehabilitating meteorological stations and strengthening networks; and, Quarterly update of meteorological / climatic data for ENR planning.

[2] The National Biodiversity Strategy and Action Plan (2003) includes, amongst the objective on 'Sustainable use of the biodiversity of natural ecosystems and agro-ecosystems' an objective on 'sustainable use of agro-biodiversity'. The following strategies are defined: (1) improved performance of native varieties and species; (2) promotion of sustainable traditional production systems; (3) prevention of introduction of intrusive species, control and eradication on non native species likely to threaten ecosystems and native species; and (4) development of mechanisms for checking the importation and dissemination of genetic material capable of having harmful effects on biodiversity, particularly on agro-biodiversity.

[3] The providers include ALUPA, IMBARAGA, Forrest Company and others. This is a sizeable operation: out of the US $22.8 million CIP budget for 2009/2010 16.38%, i.e. US$3.7 million was spent on the bulk purchase of improved seeds.

[4] This includes indicators on: number of farms growing export crops; and increases in crop production. Associated targets for 2012 are: 50% increase (by 2012) in number of farms growing export crops and 6% average annual increases in crop production.

[5] Some of the seeds, such as hybrid maize varieties, are imported from Kenya and other nations while others – typically open-pollinated varieties – are cultivated within Rwanda under contract to RAB; one of the largest producers is the Army.

[6] The Agriculture Sector Performance Report 2010-2011 explained that maize and beans planted late in Season A (to early November) were hit by drought and their yields subsequently decreased.

[7] As discussed in the Workshop of 08/12/11, the crop selection policy under CIP may increase vulnerability to pests and diseases. There is some evidence to support this notion as offered in the Baseline for Issue T4.

[8] This Sub-programme includes the following elements: participatory research activities established and supported; farmers become more involved in establishing research agendas; competitive research funding mechanism established; strengthen ISAR's (RAB) capacity; and increased adaptive research on varieties from the region. The respective Indicators/Quantities up to 2012 include: six participatory research programmes established with farmer groups; seven research stations are converted so that farmers have the main voice in establishing research agendas; ISAR (RAB) linked to new integrated cassava programme; participation of ISAR (RAB) scientists in specialised training of extension agents in the new facility; and adaptive research programmes for at least 3 crops and 20 varieties from the region.

Notes to Chapter 8: Technical issue 4 (pest and disease management)

[1] The document states *"Rwanda will implement a push-pull system using Napier grass and Desmodium legume to manage pests in fields of maize, sorghum, millets and rain-fed rice. "Push-pull" strategies increase maize yield, fix nitrogen into farm soils and provide a continuous supply of cattle fodder from the harvest of Napier grass and Desmodium, which improves milk yields of cattle while also reducing methane emission due to improved fodder regimes."*

[2] Pest: *as defined under the Draft Law of Agro-chemicals*: any insect, rodent, weed, virus, nematode, fungus, bacteria or other organism causing plant disease or interfering with, damaging or destroying crops, food, human beings, animals and other things.

Pesticide: *as defined under the Draft Law of Agro-chemicals:* any substance or mixture intended for preventing, destroying or controlling any pest (as above), unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood and wood products, or animal feedstuffs. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant, or agent for thinning fruit or preventing the premature fall of fruit, and substances

applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport *but excludes substances which may be administered to animals for the control of insects, arachnids or other pests in or on their bodies*.

[3] The laws and regulations grant slightly different treatment and control to substances used to protect livestock from parasites.

[4] A number of producers and exporters to the EU and other markets in the coffee, tea and fresh horticultural produce sectors are, irrespective of local legislation, bound to comply with numerous safe management practices under the *GlobalGap* standard and other standards and practices including HACCP (focusing on contamination prevention through hazard analysis and critical control points), imposed by importing nations which include a regime for keeping use of chemicals, and so their residues, within safe limits. The regimes in place for these export sub-sectors are illustrative of the potential scope of the subject matter of this Section, which focuses on staple crops.

[5] Some of the examples of practical challenges facing the agriculture sector are described below:

Highland growers of ISAR-bred maize variety Tamira (Pool 9A) have experienced (2011) epidemic-scale outbreaks of 'Nkongwa' stem borer at the two-month stage; this variety is more sensitive to borer than imported hybrids from Kenya (short supply). Unchecked it can cause crop failure. It is not a new pest; traditionally it has invaded plants after grain-fill and not been economically significant. In Musanze District three Sectors are planted with Kenya hybrid and 14 are planted entirely with Tamira under the CIP centrally planned programme. The respective 14 sectors have no other maize variety under the terms offered by CIP.

CIP provides insecticide for serious borer invasion at no charge. RAB is developing borer control/eradication options; there is just one current remedy: Chloropyriphos (3.5 to 5 ml/ 10l), a systemic insecticide. Outbreaks of leaf miner occur in Irish potatoes: Chlorpyriphos is being tried under RAB supervision and contact insecticides Lamda-Cyalothrin and Dimethoate are under trial. Late potato blight is treated with Mancozeb – at weekly intervals where deemed necessary in high rainfall locations.

Notes to Chapter 9: Technical issue 5 (rural feeder roads)

[1] Cited documentation of RFR SPSP Formulation Team (as at 19/12/2011):

- ToR_RWANDA 10th EDF MTR - SPSP RuralFeederRoads FORMUL STUDY ToRs _ 120911corrig.pdf
- Environmental Aspects of Feeder Roads in RwandaKBTND041211.docx
- 20111207 SUMMARY of Final Report (KBT) revJCF.docx
- Interim Report Draft 2011-273049 091211 Ver Pre-Final ATKINS + JCF.docx
- Logical Framework(1).docx version 11/12/2011
- PowerPoint presentations of 12 & 13/12/2011:
    - Session 1Key Assessment Areas.pptx
    - draft - Session 2 Technical Issues.pptx
    - Session 3 Programme Objectives.pptx
    - Session 4 Programme Management.pptx
- Districts selectionRFRtoDonors301111.docx

[2] They also improve consumer access to safe and affordable food and so strengthen food security, reduce the time taken to access essential services including health and education and facilitate access of emergency services.

[3] Memorandum from the SEA Team to the Formulation Team and EU 18/12/2011 – see Annex B9.8

[4] Districts selected (tentative) for EU Programme (*updated on request as at 29/01/2012*):

District	Total production area of maize and beans (ha)	Province	Topography	SAFEGE ranking out of 30 for steepness of slopes (%land >16% slope)
Ngororero	15,238	Western	Mountainous	1, 84%
Rulindo	16,213	Northern	Mountainous	3 ; 77%
Muhanga	10,252	Southern	Mountainous and Rolling Hills	7 ; 72%
Huye	11,350	Southern	Rolling Hills	14: 51%
Rubavu	21,908	Western	Rolling Hills	22; 34%
Ngoma	30,696	Eastern	Low lying and Marsh lands	26; 26%
Bugesera	23,491	Eastern	Low lying and Marsh lands	30; 7%

[5] The SPSP Formulation documentation considers criteria of a non-commercial nature as well as criteria related to crop evacuation, marketing and post-harvest development.

[6] To facilitate finalization of their draft Report the Formulation team was briefed on 18/12/2011 about the following observations from the SEA team regarding the indicated strategy for SPSP implementation:

I. It was noted that the document summarizing the draft Final Report stated: "Environmental issues will be promoted by incorporating the environmental impact assessment and mitigation measures in the feasibility and design stages, by implementing the contractor's environmental management plan (EMP) and by effectively monitoring the environmental aspects during the rehabilitation works."
II. With respect to the related Formulation support document of 04/12/2011 entitled 'Environmental Aspects of Feeder Roads in Rwanda', generated at the request of the SEA team:
    a. 'ENVIRONMENTAL ISSUES': the SEA team considered that the section dealing with 'Drainage' did not need supplementation but the section on 'Slope Stabilisation' and 'Mitigation measures' required supplementation;
    b. 'CONTRACTOR'S ENVIRONMENTAL MANAGEMENT PLAN (CEMP)': the section was considered suitable (including matters related to borrow pits and land restoration) but the SEA team concluded that some supplementary measures should be included as described below.
III. The Code of Practice and actual management systems of A) Supervising Engineers (who certify BOQ; quality of work; payments, etc.) and B) Road Rehabilitation and Maintenance Contractors needed to incorporate Environmental Capability which included capability related to the issues set out below at IV and V – should be a requirement.
IV. The adopted Road Standard(s) must incorporate rigorous guidance and specifications for Vegetative Protection of Water Courses, Verges, Embankments and Cuttings and other earthen structures associated with RFR rehabilitation and maintenance, according to soil type and other geological and hydrological considerations – should be a requirement.
V. Minimum road specifications applied to the respective implementation should require climate-proofing road design, so that roads and associated structures would be capable of sustaining greater intensity of rainfall as may be indicated by any officially recorded trends generated by official hydro-agro-meteorological information systems.

VI. In the event that MININFRA and RTDA deviated from the intended adoption of a 4m standard carriageway width (commensurate with most existing RFR carriageway widths), there would be need to incorporate the following conditionalities:
   a. Preparation and adoption of an environmentally sustainable road profile design;
   b. Redefinition and adoption of a safe buffer zone (forestry, etc.);
   c. Redrawing and re-surveying/registration of private property boundaries;
   d. Recalculation, assessment and policy clearance of respective changes in environmental impacts (e.g. more run-off; more murram road fill/km); and
   e. Addressing any other new impact that could have the potential to be environmentally unsustainable or harmful.

Notes to Chapter 10: Systemic issue 1 (monitoring and evaluation)

[1] E.g. soil erosion, agro-forestry, use of fertilisers, use of pesticides, water quality, marshland development, farming practices, improved seeds, irrigation, environmental management in agro-industry and climate variability warning systems.

[2] EDPRS, section 5.14.

[3] The JSR SWOT analysis of SPTA2 (26-27 Sept. 2011) identifies, as one of the weaknesses; "monitoring and evaluation perhaps took a back seat in the priority of the PSTA2, with the detailed log-frame not regularly followed up".

[4] See Chapman (2011) for more details.

Notes to Chapter 11: Systemic issue 2 (climate variability and climate change)

[1] These are: 'Integrated Water Resources Management and Planning'; 'sustainable land use management and planning'; 'sustainable small-scale energy installations in rural areas'; 'green industry and private sector investment'; 'efficient resilient transport systems'; 'ecotourism, conservation and PES promotion'; 'sustainable forestry, agroforestry and biomass energy'; 'disaster management and disease prevention' and 'climate data and projections'.

[2] E.g. in the past 36 years average annual temperature in Kigali has increased gradually by 0.9°C and variations of standardised absolute maximum temperatures in Kigali point to an increase of 2.7°C between 1983 and 2005; also erratic rainfall patters are demonstrated from records at Kigali airport, and a tendency towards progressively shorter rainy seasons.

[3] Although there isn't global agreement between all GCMs applied.

[4] There are initiatives from FAO, WB, UNDP and the UK Hadley Centre (Byamukama *et al*, 2011).

[5] Famine Early Warning System.

Notes to Chapter 12: Systemic issue 3 (Environmental Impact Assessment system)

[1] Source: REMA, personal communication (comments to draft version of the SEA report).

[2] Categories are: IL1 ' projects not requiring further environmental analysis'; IL2 'projects not requiring a full EIA but necessitate a further level of assessment' and IL3 'projects requiring a full EIA'.

[3] The responsibilities of REMA are defined in Law N°16/2006, and which include the examination and approval of EIA reports.

[4] This concern is widely shared amongst actors in environmental protection. As an example, a recent on-site review of EMP implementation of agriculture project carried out by MINAGRI found an unsatisfactory degree of implementation.

Notes to Chapter 13: Systemic issue 4 (local capacities)

[1] For example, in the framework of Organic Law N°04/2005 'determining the modalities of protection, conservation and promotion of environment in Rwanda', decentralised entities are responsible for, *inter alia*,: (1) ensuring activities related to better management of land, especially controlling soil erosion and tap rain water; (2) afforestation, protection and proper management of forests; (3) efficient management of rivers, lakes, sources of water and underground water; (4) efficient management and effective use of swamps; and (5) protection and proper management of reserved areas, historical sites, endangered animal and plant species.

[2] Other initiatives include: in 2008 functional reviews were prepared for the main line ministries; in the same year a 'District capacity building needs assessment and planning' document was prepared (MINALOC and MIFOTRA, 2008); in 2009 a National Skills Audit was conducted by MIFOTRA.

[3] These include; Housing, Urban Affairs and Infrastructure; Planning and Economic Affairs; Education; Youth and Sports; Health; Good Governance and Special Programmes; and Revenue Collection.

[4] As a notable exception to the general pattern, in 2011 Nyagatare District supplemented its already advanced ICT system (integrating Sector offices) with supply of internet-linked mobile phones to all officers at District and Sector level.

[5] The general responsibilities of Environment Committees include: (1) ensuring the implementation of the laws, policies, programmes and plans relating to the protection, conservation and promotion of the environment in Rwanda; (2) monitoring issues relating to awareness raising of the population on environment protection, and proper land use; and (3) ensuring that persons who destroy the environment are pursued by the competent institutions. As well, every Environment Committee is in charge of overseeing the functioning of the committee below it in hierarchy.

[6] While Nyagatare has elected to invest significantly in ICT and mobile communications, Ngororero District has established the precedent of devoting recurrent budget resources to the creation of the new post (2011) of Infrastructure and Land Officer in all Sectors, due to the identification of the inability of Sector Agronomists to effectively cope with their Agro-environment responsibilities alongside the multiple tasks inherent to settlement of land adjudication/ titling questions and to civil works of both buildings and rural roads.

Notes to Chapter 14: Recommendations to the GoR to enhance environmental performance of the agriculture sector

[1] With the aim of facilitating the task of addressing the recommendations in the SPTA3 document, Annex C14.1 presents the recommendations in relation to the SPTA2 log-frame.

[2] According to NISR (2008).

[3] *"Improved farming methods refer to the use of chemical as well as organic fertilisers"* (NISR, 2008).

[4] These indicators are consistent with those recommended to the EC for inclusion as indicators associated to the disbursement of SBS variable tranches.

[5] Key issues whose recommendations are not reflected in proposed indicators for the CPAF include: soil erosion control (as already part of the CPAF); rural feeder roads (as recommendations were provided for the corresponding EC SPSP formulation); M&E system; EIA system; and local capacities. These last three key systemic issues were not deemed necessary to reflect at the CPAF level, as the associated recommendations are of a more specific nature and not exclusive to the agriculture sector.

Notes to Chapter 15: Recommendations to the European Commission

[1] Vision 2020 includes an indicator on *'use of fertilisers (kg/ha/yr)'*, whereas the EDPRS includes the following indicators: *'% of farms using inorganic mineral fertilisers'*; as well the ASWG is measuring *'mineral fertilisers used (MT)'* as part of the AJSR.

[2] The EDPRS includes an indicator on *'% of farm households using insecticides'*.

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ANNEXES

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Annex A1: Bibliography

Baechler, G. (1999) *Violence through environmental discrimination: Causes, Rwanda Arena and Conflict Model*. Kluwer Academic Publishers.

Byamukama, B; Carey, C; Cole, M; Dyszynski, J; and Warnest, M (2011) *National Strategy on Climate Change and Low Carbon Development for Rwanda – Baseline Report*. University of Oxford, Smith School of Enterprise and the Environment.

Byers, AC (1990) *Preliminary results of the RRAM Project soil loss and erosion control trials Rwanda, 1987-1988*. Proceedings of the International Symposium: Research Needs and Applications to Reduce Erosion and Sedimentation in Tropical Steeplands. IAHS-AISH Publication No. 192. International Association of Hydrological Sciences. Fiji.

Cantore, N (2010) *The Crop Intensification Program in Rwanda: a sustainability analysis*. Overseas Development Institute (ODI).

Chapman, N (2011) *Review of M&E Arrangements for Rwanda's Agricultural Sector Support, Draft Report*.

Clay, D; Kelly, V; Mpyisi, E; and Reardon, T (nd) *Input use and conservation investments among farm households in Rwanda: patterns and determinants*.

Clay, D and Lewis (1996) *Land use, soil loss and sustainable agriculture in Rwanda*. Michigan: MSU/MINAGRI Papers.

de la Paix, MJ; Ge, J; Habiyaremya, G; Mukakayumba, UA (2009) Impact of radical terraces on Rwanda environment: case of Kaniga sector, *International Journal of Sustainability Science and Studies*, **1**(1): 67-72.

Dinar, A; Hassan, R; Mendelsohn, and Benhim, J (2008) *Climate Change and Agriculture in Africa, Impact Assessment and Adaptation Strategies*. Earthscan: London.

Dyszynski, J; Watkiss, P and Brooks,N (2011) *Climate Change Strategic Evaluation of the DFID Rwanda Programme, Draft Report to DFID Rwanda*.

Eco-Excellence Consultancy Ltd. (2011) *Livestock Infrastructure Support Programme (LISP) Strategic Environmental Assessment*. Prepared by P. Kabanda, Kigali, Rwanda.

Environment and Natural Resources Sector Working Group (2010) *Backward-Looking Joint Sector Review FY 2009/10*.

European Commission (2009) *Guidelines on the Integration of Environment and Climate Change in Development Cooperation*. EC Tools and Methods Series Guidelines No. 4.

European Commission (2009) *EC Cooperation: Responding to climate change. Sector Script for Agriculture & Rural Development, Information Note*.

Hydroplan Ingenieur GmbH and SHER Ingénieurs-Conseils s.a. (nd) *Schéma Directeur d'Aménagement des Marais, de protection des Bassins Versants et de Conservation des Sols. Rapport de synthèse, Version definitive*.

Hydroplan Ingenieur GmbH and SHER Ingénieurs-Conseils s.a. (2002) *Schéma Directeur d'Aménagement des Marais, de protection des Bassins Versants et de Conservation des Sols. Rapport global definitive phase 1 Annexe 3 Etude environnementale*.

Hydroplan Ingenieur GmbH and SHER Ingénieurs-Conseils s.a. (2002) *Schéma Directeur d'Aménagement des Marais, de protection des Bassins Versants et de Conservation des Sols. Rapport global definitive phase 1 Annexe 6 Schéma d'aménagement de marais*.

IFAD (2011) *Implementation Support Report of the International Fund for Agricultural Development. Kirehe Community-Based Watershed Management Project (KWAMP)*. IFAD Report 2405-RW.

International Trade Centre (2008) *Overview of organic agriculture in Rwanda and options for policy and trade development*.

Kalisa, J. (nd) *The effects of climate change in Rwandan region*.

Keller, G and Sherar, J. (2003) *Low-Volume Roads Engineering, Best Management Practices Field Guide*. Produced for USAID.

Kelly, V; Mpyisi, E; Shingiro, E and Nyarwaya, JB. (2001) *Agricultural Intensification in Rwanda: an elusive goal. Fertilizer use and conservation investments*. Prepared for MINAGRI. FRRP/DSA Policy Brief.

MIFOTRA/HIDA (2008) *Mapping of ongoing and planned capacity building activities in Rwanda, final report*. UNDP.

MINAGRI (2008) *Supporting Fiscal Decentralisation in the Agricultural Sector, Developing guidelines and a training manual for utilisation of earmarked grants to districts. Mission report with (i) assessment of the present situation and issues that need resolution and (ii) drat outline LG planning and budgeting manual for agriculture*. Prepared by ETC East Africa Ltd, and in collaboration with MINALOC and MINECOFIN.

MINAGRI (2009) *Strategic Plan for the Transformation of Agriculture in Rwanda – Phase II (PSTA II) final report*.

MINAGRI (2010) *Agriculture Sector Performance report Fiscal Year 2009/2010, Sector Evaluation Report for the Joint Agriculture Sector Review for the Financial Year 2009/2010*.

MINAGRI (2010) *Crop Intensification Program (2008-2009) Evaluation Report*. Prepared by IFDC.

MINAGRI (2010) *Agricultural Mechanization Strategies for Rwanda, shifting from subsistence agriculture to market-oriented agriculture*. Prepared by A. Kathiresan.

MINAGRI (2011) S*ector Evaluation Report for the Joint Sector Review FY 2010/2011*.

MINAGRI (2011) *Practical Guidelines for the establishment of farmer field school (FFS) programme for Rwandan conditions*.

MINAGRI (2011) *Crop Assessment 2011A Season: crop area, yield and production – draft report*.

MINAGRI (2011) *EDPRS Self-Assessment*. December, 2011.

MINAGRI (2011) *Strategic capacity building initiative*. Powerpoint presentation.

MINALOC (2006) *Strategy for developing capacity for effective decentralised governance and local level service delivery in Rwanda*.

MINALOC and MIFOTRA (2008) *District Capacity Building Needs Assessment and Planning, draft findings and recommendations*. Dfid, Adam Smith International.

MINECOFIN (2009) *EDPRS Goals and Achievements*. Kigali.

MINECOFIN (2011) *2011-12 Districts' Earmarked Transfers Guidelines*.

Ministry of Environment and Lands (2010) *Action Plan for the Ministry of Environment and Lands (MINELA) July 2010 – June 2011*.

Ministry of Natural Resources (2008) *Etablissement d'un inventaire national rapide des marais et elaboration de 5 avant-projets d'arrêtés ministériels relatifs aux marais, Module 3 Rapport* Final. Projet de Gestion Integree des Ecosystems Critiques (MINIRENA-REMA-IMCE).

Musahara, H (2006) *Improving Tenure Security for the Rural Poor Rwanda – Country Case Study*. Legal Empowerment of the Poor (LEP). Food and Agriculture Organisation (FAO) of the United Nations.

National Institute of Statistics of Rwanda (2008) *Metadata CPAF indicators*.

National Institute of Statistics of Rwanda (2009) *Statistical Yearbook 2009 Edition*.

National Institute of Statistics of Rwanda (2010) *National Agricultural Survey 2008 (NAS 2008)*.

National Institute of Statistics of Rwanda (2009) *National Population Projection 2007-2022*.

NUR (2002) *Les polluants des eaux du Rwanda et leu impact sur l'environnement sous regional*. Commission de recherché de l'Université Nationale du Rwanda (NUR), Kigali.

OECD DAC (2006) *Applying Strategic Environmental Assessment, Good Practice Guidance for Development Co-operation*. OECD DAC Guidelines and Reference Series, Paris.

Oruko, L; Randall, I; Bwalya, M; Kisira, S; and Wanzala, M (2011) *Mutual Accountability Framework for the Comprehensive Africa Agriculture Development Programme*. NEPAD, African Union.

RALGA (2010) *Challenges facing local governments in Rwanda, A study report*. Kigali, Rwanda.

RALGA (2010) *Factors affecting service delivery in local governments, A study report.*

REMA (nd) *Economic Analysis of Natural Resources Management in Rwanda*. Supported by the PEI.

REMA (2009) *State of Environment and Outlook Report 2009*.

REMA (2010) *Public Environmental Expenditure Review to support Poverty Environment Initiative in Rwanda.* UNDP, UNEP.

REMA (2010) *A review of existing and potential environmental fiscal reforms and other economic instruments in Rwanda*. REMA supported by Poverty Environment Initiative (PEI), UNDP, UNEP.

REMA (2011) *Rwanda Environmental Indicators. Validation Workshop Report, Umubano Hotel Kigali 6th December 2011*.

Rwanda SAKSS (2011) *Rwanda Trends and Outlook Report 2010*.

Stockholm Environment Institute (2009) *Economics of Climate Change in Rwanda.*

Twagiramungu, F (2006) *Environmental Profile of Rwanda*. European Commission and Government of Rwanda.

UKAID (2011) *Rwanda Agriculture Sector Delivery Grant 2011/12 to 2014/15 Business Case*. DFID, 1 November, 2011.

UNEP (2011) *Rwanda – From Post-Conflict to Environmentally Sustainable Development*.

USAID (2010) *Assessment of Post-Harvest Opportunities in Rwanda, USAID Post-Harvest Handling and Storage Project (PHHS).*

USAID (2011) *Rwanda Feeder Roads Improvement Program. Scoping Statement – Feeder Roads Improvement Programmatic Environmental Assessment (PEA)*. Prepared by T. Catterson, IRG/Parsons.

Van't Klooster, K; Smet, J and Kente, L (2011) *Scoping Mission on Water in Rwanda, the Rwandan Water Scan*. Draft report for the Embassy of the Kingdom of the Netherlands in Rwanda, mission period: 10-16 August, 2011.

World Bank (2011) *Developing sustainable public sector capacity and performance for Rwanda's growth and competitiveness: key issues, challenges and recommendations. A study based on case studies of the agriculture and energy sectors. Draft report.*

Annex A.2a: Prioritisation of preliminarily identified key issues during scoping

During the scoping phase key issues were preliminarily identified and prioritised making use of a combination of: expert judgement; findings from a prioritisation exercise at the stakeholders' scoping workshop; and use of a risk-focused assessment of significance.

The findings from this preliminary prioritisation are reproduced here. Notice that the Key Issues were re-organised during the SEA Study phase, based on new findings. This annex is meant for methodological reference only.

Risk management focus

Crossing likelihood (of impact occurring) with magnitude of impact gives an approximation of impact significance and an indication as to whether the 'impact' should be acted upon, and the level of priority.

			Magnitude of Impact				
			Insignificant	Minor	Moderate	Major	Catastrophic
			1	2	3	4	5
Likelihood of impact occurring	Almost certain	5	6	7	8	9	10
	Likely	4	5	6	7	8	9
	Possible	3	4	5	6	7	8
	Unlikely	2	3	4	5	6	7
	Rare	1	2	3	4	5	6

This matrix however is adequate only for the case of impacts expected from implementing a policy action (i.e. situations that do not currently exist), and does not capture the significance of policies acting on current impacts in the (agriculture) sector. Nevertheless a modification can be made for the case of these 'impacts by omission'. Then we can cross likelihood of NOT occurring (i.e. not addressing effectively a concern) with magnitude (of the impacts from not adequately addressing the concern).

			Magnitude of Impact				
			Insignificant	Minor	Moderate	Major	Catastrophic
			1	2	3	4	5
Likelihood of concern not being adequately addressed	Almost certain	5	6	7	8	9	10
	Likely	4	5	6	7	8	9
	Possible	3	4	5	6	7	8
	Unlikely	2	3	4	5	6	7
	Rare	1	2	3	4	5	6

The colour coding is as follows:

- 8-9-10 (red zone): impact management or preparedness highly recommended
- 6-7 (orange zone): impact management or preparedness recommended
- 5 (yellow zone): impact management or preparedness desirable
- 2-3-4 (green zone): impact management or preparedness not a priority

In order to be as effective as possible, the analysis of key issues needs to focus on those aspects that are particularly important (from an environmental performance point of view). The key issues that were retained were further explored, particularly during the stakeholders' workshop, in order to determine the specific components that would need to be further explored.

Thus the long list of key issues was narrowed down to a short list; this short list, in turn, was segmented into particular aspects. The resulting list of key issues identified for more detailed analysis in the SEA Study is shown below. It is then subjected to prioritisation based on: impact significance from application of the risk determination table (likelihood *vs.* magnitude) and prioritisation designated by stakeholders (stakeholders' workshop).

As can be seen, both approaches largely agree. This is not a surprise, as the application of the risk management approach was informed to a large extent on the stakeholder discussion, albeit taking into account also expert judgement and all the preliminary knowledge gained in the scoping phase.

Key Issue	**Magnitude of expected impact** (from new activities or by inadequate policy)	**Likelihood** (of impact occurring / of concern not being adequately addressed)	**Impact significance**	**Priority valuation by key stakeholders**
1. Soil erosion				
1.1. Actions undertaken to control soil erosion are not being effective. This is due primarily to: measures do not necessarily match soil and terrain characteristics; measures are not targeted to priority areas of concern; and resources and capacities at the local level are very limited for implementation of effective measures.	4	4	8	15% of total score (highest) 0 votes for 'not relevant'
1.2. Policy is neglecting the sustainability of soil erosion control measures, leading to further ineffectiveness. The policy focus is on new measures for soil erosion control, neglecting maintenance and repair of existing (and new) structures.	4	4	8	
1.3. Monitoring and Evaluation of soil erosion control does not provide an objective and useful indication of progress. This is derived from: a very broadly defined indicator subject to diverse interpretations; lack of a common methodology for measurement of progress. As well, the M&E system only gives an indication of new structures, and does not measure sustainability of existing structures. This may lead to overestimation of progress.	3	4	7	
2. Water catchment management				
2.1. Abstraction of water for irrigation may contribute to generate overall water scarcity. Water resources are being committed without due knowledge on water balance and impacts. The context: a detailed water balance for the country has not been produced, whilst at the same time policies promoting water intensive activities are being promoted (primarily in agriculture, energy and industry). Furthermore the institutional and regulatory framework to guarantee sustainable management of water resources is not yet in place.	3	3-4	6-7	13% of total score (2nd highest) 0 votes for 'not relevant'
2.2. Agro-forestry measures are not being effective in contributing to catchment management. The focus of policy is on planting of new trees and neglects the maintenance of forested areas. Policy measures are failing to raise awareness of benefits of agro-forestry and promote on-farm agro-forestry. Measure of progress is output based (number of trees planted), without adequate attention given to outcomes.	4	3	7	
3. Local capacities for good environmental Management				
3.1. Local capacities for an adequate environmental management are very limited, and inadequate to address key concerns. The main responsibility for implementation of environmental management actions in the	5	4	9	11% of total

country falls on the local governments. However the existing capacities (human resources, degree of training, financial resources) is very limited, leading to insufficient measures.				score (3rd highest)
3.2. Inter-institutional coordination mechanisms are inadequate to ensure sector policies and priorities are up-taken at the local level. There are no clear mechanisms that allow the uptake of central government sector strategies (e.g. SPTA2 and ENR SSP) at the local level (i.e. in DDPs and related Performance Contracts). Local government is accountable to MINALOC and to the President (in the case of Performance Contracts), and only indirectly to MINAGRI.	4	3	7	0 votes for 'not relevant2
4. Adequacy and consistency of M&E systems				
4.1. M&E systems are not sufficiently coordinated or consistent, leading to inadequate guidance on priorities of action. Indicators from different ministries are not necessarily compatible (e.g. between ENR and agriculture), performance assessment in the JSRs focuses on advances from actions controlled by the central government, with no clear link to advances made at the local level, and adequate baselines are often lacking.	3	3	6	9.5% of total score (4th highest) 0 votes for 'not relevant'
5. Environmental risks of marshland reclamation				
5.1. Marshland reclamation for agriculture will lead to significant impacts on the environment. Such impacts will be in the form of: alteration of physical-chemical properties, drying of wetlands, impacts on biodiversity. They will take place in the context of ineffective EIA/EMP systems, albeit also in the context of categorised wetlands according to degree of protection.	3	4	7	9% of total score 0 votes for 'not relevant'
6. Environmental risks of increased use of pesticides				
6.1. Increased use of pesticides will have an impact on water quality. This will take place in the context of inadequate resources/capacities for proper training of farmers, lack of approved regulatory framework for agrochemicals.	4	3		9% of total score
6.2. Increased use of pesticides will have a significant impact on health of farmers.	3	3	6	6 votes for 'not relevant' (out of 53)
7. Environmental integration into feeder roads planning, construction and maintenance				
7.1. Construction of new feeder roads will lead to exacerbate soil erosion. This will occur due to the lack of environmental standards for planning, construction and maintenance, and their effective implementation,	4	3	7	8% of total score 0 votes for 'not relevant'
8. Environmental and climate change risks of crop selection policy				
8.1. The crop selection policy under the CIP will exacerbate vulnerability to climate change.	3	3	6	

Crops selected are expected to be grown by farmers, and financial support for inputs is limited to target crops. The system does not prioritise building capacities for farmers to select crops under CIP according to circumstances (i.e. build flexibility into the system).				7% of total score
8.2. The crop selection policy under CIP acts as an obstacle to benefitting from less resource-intensive, but more environmentally-friendly approaches. This is the case particularly of IPM (which normally requires inter-cropping) and organic production.	3	2	5	3 votes for 'not relevant' (out of 53)
9. Environmental impacts of increased use of fertilisers				
9.1. The large increase in use of inorganic fertilisers will exacerbate water pollution. This in the context of: limited know-how on application, but also taking into account: limited knowledge of sources of water pollution.	3	2	5	7% of total score 9 votes for 'not relevant' (out of 53)
10. Environmental impacts from increased agro-industrial activity				
10.1. The increase in agro-industrial activity will have significant impacts on water quality. This will take place in a context where current industrial activity is not compliant with wastewater discharge regulations, where enforcement effectiveness of the environmental legal framework is limited, and where effectiveness of the EIA/EMP system is limited.	3	2	5	5% of total score 9 votes for 'not relevant' (out of 53)
11. Increased risk of malaria from building of small dams for hillside irrigation				
11.1. The construction of small dams for hillside irrigation will increase the risk of malaria.	2	2	4	Not considered relevant by group from start
12. Environmental impacts of increased livestock				
12.1. Increased livestock being promoted may exacerbate environmental impacts, especially in terms of contribution to soil erosion.	2	2	4	4% of total votes 7 votes for 'not relevant'
13. Trans-boundary environmental impacts				
13.1. Trans-boundary environmental impacts are being caused by, e.g. water pollution, disease, cattle crossings.	3	1	4	2% of total score 19 votes for 'not relevant'

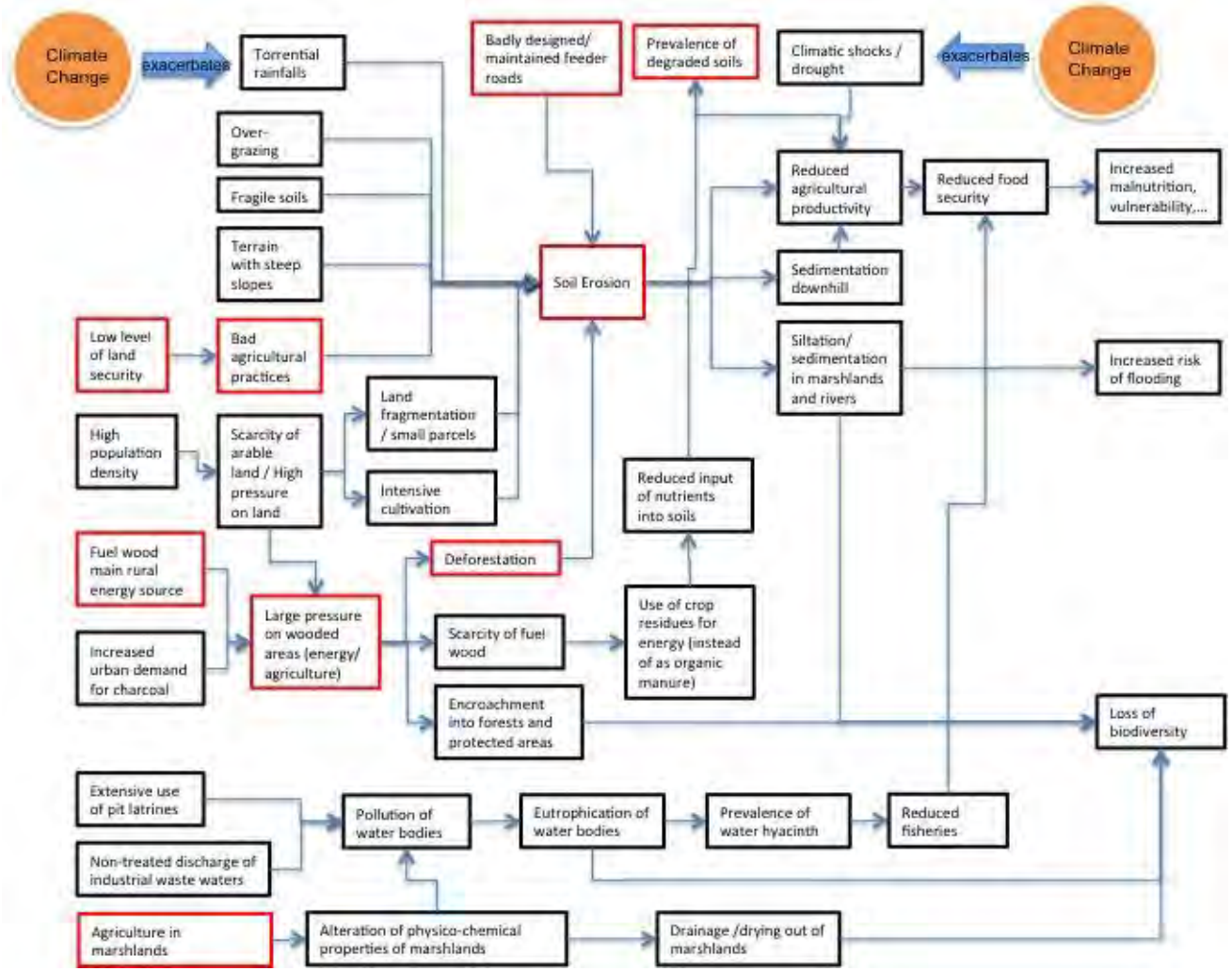
Annex A.2b: Impact identification

Initial identification of potential impacts was carried out with the support of some specific methods, in addition to stakeholder consultations, expert judgement, appreciation from field visits, and the findings of the scoping stakeholders' workshop.

In particular the following methods were used:

- **Cause-effect diagram** showing the main environment-agriculture interactions in Rwanda.
- A **Leopold-type matrix**, used as an aid to the identification of potential impacts associated to the implementation of SPTA2 components. This matrix shows a limited number of SPTA2 components that have potential significant environmental impacts associated to their implementation, whereas many SPTA2 components have potential positive impacts; this shows a number of possibilities of convergence with environmental objectives.
- **Consistency and impact analysis of environment-agriculture related indicators**, which shows the degree of consistency between indicators from the main M&E systems, and makes an appraisal of the potential positive and negative implications of using such indicators.

Cause-effect diagram of key environment-agriculture interactions in Rwanda



Leopold-type matrix for analysis of potential impacts

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
P1. Intensification and development of sustainable production systems																								
SP 1.1. Sustainable management of natural resources and water and soil conservation																								
Construct 50 valley dams and reservoirs with conveyance structures for irrigating 3,570 ha																								
Catchment protection (associated to the above)																								
Participatory watershed management plans																								
Protection of 20% of land against erosion																								
Create effective buffer zones around nt'l parks																								
SP1.2 Integrated systems of crops and livestock																								
1.2.1. Crop diversification and intensification																								
Replicate the systems of integrated livestock-cropping-agroforestry systems																								
Link integr. crop dev. to pilots on pressurised irrig.																								
Scale up One Cow per Poor Family programme																								
1.2.2. Livestock development																								
Animal disease control operations: control posts and monitoring; vaccinations																								
Better, more complete veterinary services																								
Artificial insemination and training																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Breed improvement programme for all species																								
Livestock watering facilities																								
Farmer training in intensive animal husbandry+fodder supply																								
Mgmt of internal lakes & aquaculture development																								
Support for beekeeping, including for organic honey																								
SP 1.3. Marshland development																								
Complete marshland dev. plan + feasibility studies																								
Dev 8,000ha marshlands w/irrigation systems, incl. drainage systems+ protection of catchment and farmer training																								
SP 1.4. Irrigation development																								
Complete development of irrigation master plan																								
Formulate regulations/legislation defining farmers' water use and tenure rights over irrigation systems, + structuring WUAs																								
Promote formation of WUAs + train their members																								
Develop 13,000 ha of hillside irrigation systems																								
Implement on pilot basis pressurised irrigation on hillside terraces and contours, with fertigation																								
SP 1.5. Supply and use of agricultural inputs																								
1.5.1. Fertiliser and agrochemical supply and use																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Establish long-term approach for fertiliser imports																								
Continue voucher programme w/wider coverage																								
Fertiliser demonstration plots, participatory fertilisation trials																								
Sustainable agrochemicals distribution network																								
Fertiliser quality control system																								
Negotiate free EAC market in agricultural inputs																								
Studies for dev. of methane-based fertiliser prod.																								
1.5.2. Certified seeds and other inputs																								
Legal and institutional framework for certified seeds																								
Expanded production of basic seeds																								
Seed multiplication and distribution																								
Promote demand for certified seeds																								
Development of private nurseries																								
Dev. of agric. mechanisation policy + machinery enterprises																								
SP 1.6. Food security and vulnerability management																								
Regional+ national early warning systems on food																								
Wider coverage of hermetic storage facilities + training																								
Strengthen HH nutrition health training, programmes																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Gender-friendly crops and livestock																								
More efficient fuel-wood stoves (promotion)																								
Potable water sources for households																								
P2. Support to the professionalization of the producers																								
SP 2.1. Promotion of farmers' organisations and capacity building for producers																								
Strategy and programme for capacity building in farmer and village organisations																								
Local points for training farmers, sharing experiences																								
Train abbatoir operators and selected groups of farmers in proper care of livestock skins and hides																								
Train farmers in agronomic and quality issues for coffee																								
SP 2.2. Restructuring proximity services for producers																								
Develop and promote a system through which farmers contract with the farm advisors or extension agents																								
Establish a permanent training service for extension agents																								
Implement on farms participatory research-cum-extension approaches such as farm field schools																								
Programme of certifying farmers as trainers and facilitators																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Programmes of mass extension messages, strengthen CICA																								
SP 2.3. Research for transforming agriculture																								
Programme of participatory research with farmers on their plots																								
Involve farmers in local research agendas for innovation centres																								
Mechanism for competitive award of research funding																								
Strategy to secure long-term funding support for public sector agricultural research																								
Programmes of international cooperation and staff exchange and capacity building for senior research scientists																								
Increase adaptive research on varieties imported from the region																								
Maintain and operate ISAR's in vitro laboratories																								
Strengthen ISAR's collaboration with other institutions and activities																								
P3. Promotion of commodity chains and agribusiness development																								
SP 3.1. Creating a conducive environment for business and entrepreneurship development and market access																								
Young entrepreneurs training programme																								
Train women's organisations in entrepreneurship																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Strengthen the sanitary, phytosanitary and food safety system																								
Improve the laboratories and capacity used for sanitary, phytosanitary and food safety sanalyses																								
Harmonise SPS policies and legislation and inspection and certification procedures in the EAC region																								
Support part of producers' costs of obtaining quality certifications																								
Configure Kigali airport as an effective horticulture hub																								
Accord with Uganda and Kenya for use of international airports																								
Government guarantee for air cargo space																								
SP 3.2. Development of traditional exports																								
3.3.1. Coffee																								
System to improve input distribution for coffee, and monitoring that distribution (chemical inputs, seedlings), introducing private modalities, and to increae use of organic fertiliser and shade trees																								
Identify causes of and solution for the "potato taste" problem that is reducing market acceptance of Rwanda's speciality coffee																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Turn-around programme for washing stations including upgrading infrastructure																								
Control of coffee leaf rust and other diseases and adaptive research on coffee varieties																								
Improve international marketing of coffee including initiating toll toasting and partnerships with major buyers abroad and establishing joint ventures with importers in Dubai																								
Rehabilitate coffee plantations, establish multiplication centres. Carry out a census of all coffee-producing areas																								
3.3.2. Tea																								
Privatise tea estates with farmer shareholdings																								
Pre-feasibility, feasibility studies and investment for tea estates in Karongi, Gatare and elsewhere, with cost sharing																								
Research programme on high-quality clones of tea varieties																								
Tea marketing strategies (including tea blending and packaging facility and establishment of cargo company to transport goods to and from Dubai)																								
3.3.3. Pyrethrum																								
Install solar dryers																								
Develop export markets for high value distillates																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Research on varieties with high pyrethrin content																								
Strengthen distribution of seeds with high pyrethrin content																								
SP 3.3. Development of non-traditional high-value export products																								
Specialised TA for horticulture farmers and marketing, incl. organic production and processing																								
Increae ISAR's capacity in horticulture research; disease control in high-value products																								
Continued development of sericulture																								
Cost-sharing for greenhouse cultivation																								
SP 3.4. Production and value addition for domestic staple products																								
Integrated programme for cassava development																								
Integrated programme for cereal development																								
Key supply-side interventions in domestic market crops																								
Development of the fish commodity chain in Lake Kivu																								
SP 3.5. Market-oriented rural infrastructure																								
TA for feasibility studies of new agro-processing facilities and government cost-sharing for investment in the facilities																								
Modernisation of slaughterhouses and tanneries																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Improved collection and hygienic transport of raw milk, including construction of milk processing plant at Mukamira																								
Cold storage and transport facilities including ice-making capacities at all fisheries sites																								
Plan for rural electrification with agricultural priorities																								
All-weather agricultural marketing roads																								
Refrigerated lorries																								
SP 3.6. Strengthening rural financial systems																								
Strengthen programmes for diversified rural financial services																								
Loan guarantees																								
Risk mitigation products, including pilor for wather insurance programme																								
Value chain finance including warehouse receipts, factoring regulations																								
Finance for productive investment, incl. grants-loan programme, credit lines, leasing, venture capital																								
Financial literacy and preparing the demand side for agricultural credit																								
P4. Institutional development																								
SP 4.1. Institutional strengthening and capacity building																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
Create mechanism for venture capital investments in agriculture and agro-processing																								
Create an autonomous service responsible for monitoring, controls and international communications for SPS and food safety issues																								
Create independent seed certification system																								
Assess training needs in the agricultural public sector and formulate and implement a programme for technical capacity building in the sector																								
Develop a sector-wide gender strategy																								
Leadership and Strategic Management Development Programme																								
Develop a new plan for personnel management																								
Consolidate and implement the Management Information System																								
SP 4.2. The policy and regulatory framework for the sector																								
Policy fwk for mgmt of irrigation water and soil																								
Policy framework for agro-export development																								
Decree on land consolidation																								
Agrochemicals Law																								
Reinforce production survey methodologies with updated sampling procedures designed to cover more specialised crops																								

SPTA2	Water balance	Surface water quality	Groundwater quality	Soil erosion	Soil salinization	Other soil properties	Air quality	Biodiversity	Agro-biodiversity	Terrestrial flora and fauna	Aquatic flora and fauna	Wetland systems	Protected areas	Deforestation	Landscape	Climate change vulnerability	GHG emissions	Food security	Health risks	HIV/AIDS	Employment	Social conflict	Social services	Rural infrastructure
SP 4.3. Agricultural statistics and ICT																								
Develop procedures for and train staff in timely analysis of survey data for policy makers plus collection and analysis of crop budgets																								
Establish a sector-wide ICT system with real-time market information and network of local meteorological stations																								
SP 4.4. M&E systems and coordination of the agricultural sector																								
Put in place a SWAp structure																								
PSTAII monitoring system																								
Procedures for obtaining feedback regarding agricultural programmes and projects from farmers and other stakeholders																								
Put in place an evaluation system with baselines																								
SP 4.5. The decentralisation programme in agriculture																								
Implement the recent recommendations for improving fiscal decentralisation in agriculture																								
Strengthen Joint Action Forums in the district and to strengthen the capacity of sector-level authorities to collaborate with farmers																								

Colour code:

	No significant relationship, or overall neutral effect
	Positive impact of low significance
	Positive impact of high significance
	Negative impact of low significance
	Negative impact of medium significance
	Negative impact of high significance

Consistency and impact analysis of environment-agriculture indicators

		Vision 2020	EDPRS	CPAF	SPTA2 LogFrame	ASWG JSR	ENR SSP	MTEF	CCLCDS	Sector PC	EC SBS	POSITIVE EFFECTS	NEGATIVE EFFECTS	SYNTHESIS OF OBSERVATIONS
	Soil erosion													
1	Land portion protected against soil erosion (%)	■		■	■			■		■	■	Indication of performance with regards to a key concern	Outcome indicator. Measurement methodology ambiguous, monitoring information generated prone not to be comparable. Risk it counts ineffective structures (e.g. not maintained).	Focus is on area of land protected against soil erosion. Methodology is very ambiguous and likely not to give good indication of progress + little comparability of results from different sources. Risk of giving misleadingly overtly positive results that could imply reduction in budget allocations. Measurement has focused on new structures, and no indication of effectiveness (that would reflect maintenance of structures). Indicator on soil loss due to erosion is necessary, but is not operational. Should probably de defined at EDPRS/CPAF level; would require setting up baseline and strategy/structures for measurement.
2	Agricultural land protected against soil erosion (%)		■											
3	Proportion of land sustainably managed against soil erosion					■						Positive variant to the above, as it takes into account effectiveness (e.g. structures' maintenance)	No evidence that this outcome indicator is being used.	
4	Ha of existing terraces protected and rehabilitated (including protection of new terraces)				■							Idem	Idem	
5	Land protected by trenches and progressive terraces				■							Same as for Ind. 1 above	Risk it counts in ineffective structures (e.g. not maintained).	
6	% land area with high risk of erosion							■				Outcome indicator. Potentially very useful.	No evidence of this indicator being used. No methodology.	
7	Soil loss due to erosion							■				Idem.	Idem.	
8	% annual increase in land secured against erosion						■					Same as for Ind. 1 above	Same as for Ind. 1 above. Output indicator.	

	Forestry / agro-forestry													
9	Level of reforestation (ha)	■										Output indicator addressing a key area of concern.		Important that both output and outcome indicators are defined.
10	Forestry coverage (%)		■				■	■				Outcome indicator addressing a key area of concern.		It would be important to have indicators specific to measure progress in agro-forestry. One such indicator is included under the ENRSSP, but not clear if and how it is being followed. It would be interesting for MINAGRI to up-take this indicator, and probably have it reflected in the AJSR, as it agroforestry is key component potentially contributing to: soil erosion control, water retention, energy, curbing of deforestation, livestock feeding and soil nutrient management.
11	% of farm HH trained in seed technology, tree management and post harvest				■							Output indicator. Positive indication of capacity development.		
12	Increase in number of tree nurseries				■							Output indicator. Positive indication of increase of inputs for forestation.		
13	No of sectors and cells with well maintained tree nurseries						■					Outcome indicator that shows dimension of effectiveness.	Not clear how this indicator is being measures, especially its effectiveness dimension.	
14	Number of trees planted				■					■		Output indicator. Positive indication of efforts being done.		CCSLCD indicator on 'survival rate of trees planted' will be very useful to measure effectiveness.
15	Increase in number of trees planted annually per household				■							Idem.		
16	Increase in number of trees planted per annum				■							Idem.		
17	Area of micro-catchments planted with trees						■					Idem		
18	Proportion of farmed land under agro-forestry						■					Outcome indicator. Positive to measure progress on agroforestry.	No evidence of use of this indicator. Indicator not up-taken by MINAGRI.	
19	Rehabilitated forests (ha)						■					Same as for Ind. 14.		
20	New planted forests (ha)						■					Idem.		
21	Survival rates of trees planted								■			Outcome indicator. Positive indication of effectiveness.	Not yet being implemented, nor up-taken by MINIRENA.	
22	Biomass energy security of smallholder households (joint								■			Positive to measure agroforestry/bioenergy	Not yet being implemented.	

	agroforestry strategy)								■			dimension.		
23	Area coverage of trees planted								■			Same as Ind. 10		
24	Area covered by forest plantations							■				Idem.		
	Use of fertilisers and pesticides / IPM													
25	Use of fertilisers (kg/ha/yr)	■						■					Output indicator at a broad level. Risk of indiscriminate use of fertilisers (esp. if linked to disbursement of funds) if not accompanied by measure of soil nutrient needs analyses being carried out.	Focus seems to be on increasing use of fertilisers and pesticides, and these are the parameters that are being measured. Such an approach runs the risk of: leading to indiscriminate application (especially if progress were to be linked to disbursement of donor funds) and, especially, does not take heed of soil nutrient needs. Furthermore it may be an obstacle for effective promotion of organic farming and IPM. An indicator that provides a measure that fertiliser use is responding to site- and crop-specific soil nutrient needs is required. Likewise measure of correct pesticides application is required. Use of IPM needs to be considered side-to-side with use of synthetic fertilisers, and both compared to crop yields and water quality. Currently up-take of IPM only in SPTA2 logframe, but no evidence of monitoring of this indicator, and without incidence in ASWG analysis and reporting.
26	% of farms using inorganic mineral fertilisers		■		■			■						
27	% of farms using organic fertilisers		■		■			■						
28	% of farm households using insecticides		■										Same as for Ind. 25 and 26 above, but applicable to insecticides. Also risk of acting as obstacle to IPM and organic farming.	
29	Mineral fertilisers used (MT)					■							Same as for Ind. 25 and 26.	
30	% of farms using pesticides				■								Same as for Ind. 25 and 26 but applicable to pesticides. Also, risk of acting as obstacle to IPM and organic farming.	
31	No of fertiliser demonstration plots / Increase % of farmers organisations trained in fertilisers				■							Positive for indirect measurement of sound fertiliser application (environmental impact minimising)		
32	% of farms applying fertiliser rich compost								■					
33	% of farms up-taking "push-pull" strategies								■			Positive measure for IPM.	Not yet implemented (very recent).	

34	% of farms practicing IPM				■							Positive measure, also to compare with indicators on use of pesticides.	No evidence of this indicator being applied.	
	Marshland development													
35	Area of marshland developed for agricultural use (ha)					■							Potential adverse environmental implications, if it leads to pressure to reclaim marshlands minimising environmental safeguards.	For reasons of consistency with the language in the Ramsar Convention, the term used should be 'wetlands' instead of 'marshland'. There are no major observations for the indicators. Indicator 38, however, could better refer to implementation of the EMP rather than having completed the EIA.
36	Complete marshland development plan				■									
37	% of industrial and commercial activities located in wetlands of trans-boundary importance						■					Positive to keep check on more environmentally sensitive activities.	No evidence of application of this indicator.	
38	Marshlands developed with irrigation and drainage systems and farmer training, after EIAs				■							Positive to keep check on environmental safeguards.	Could complement Ind. 35 if used in AJSR (instead of Ind. 35)	
39	% of agricultural projects in marshlands with completed EIA studies							■				Idem.		
40	Inventory and database of wetlands in place and regularly updates						■							
41	% agricultural projects in marshlands having integrated mitigation measures for environmental protection							■				Same as for Ind. 38 above.		
	Farming practices and extension													
42	Number of households per extensionist		■			■						Positive indication of resources available at local level.		No major observations. The indicator on 'no. of farms up-taking agro-ecology techniques' can be important in the context of integrated soil
43	% of farming households using improved farm methods			■								Positive implications for soil management.	Not clear how this is being measured.	

44	No of farms up-taking agro-ecology technologies								■			Idem. New indicator.	Not yet implemented.	management.
45	Volume of waste reduction / compost production								■			Idem.	Idem.	
46	Establish farmers field schools									■		Positive indication of development of capacities. Potential to link to CIP		
	Improved seeds / drought resistant varieties													
47	% of farm households using improved seeds		■		■								Risk of impact on agro-biodiversity, if improvement in this indicator is at the expense of traditional varieties.	No major observations on these indicators.
48	Seed quality certification and control in place							■						
49	% of farms adopting crops (expansion of crop varieties)								■					
50	Early harvesting varieties introduced for adaptation to climate change							■				Positive in terms of climate change adaptation.	No evidence of this indicator being applied.	
51	% of farmers cultivating drought-tolerant and low water consuming crop varieties							■				Idem.	Idem.	
	Irrigation													
52	Area under irrigation (ha)		■										Irrigation has potential adverse environmental effects associated (esp. on water availability and salinization).	These indicators could be complemented by others than could keep track of potential adverse impacts on the environment from irrigation, mainly:
53	Smallholder irrigation schemes in water scarce areas of Bugesera, Umutara, Muhanga and Huye						■					Positive in terms of climate change adaptation.		% of rivers used for irrigation with flows below the ecological water flow; salinization of agricultural lands;
54	Proportion of areas under flood						■						Same as for Ind. 52. Dimension of water availability	water use efficiency of irrigation systems

	irrigation						■						is especially risky, as this indicator is not linked to any water efficiency measure.	(Mm^3/ha or Mm^3/tonne crop yield).
55	Policy framework for irrigation and soil management completed				■									A focus on water use efficiency is necessary. Otherwise, increase in irrigation is positive also from a climate change adaptation perspective.
	Livestock													
56	% of livestock in intensive systems		■		■	■						Positive in terms of indirect measurement of one driver of soil erosion.		No major observations.
57	Increase in number of farmers associations trained in improved animal husbandry practices				■							Idem.		
	Water-catchment management													
58	Increase in the water retention capacity of watersheds				■							Positive in terms of IWRM.	No clear measurement methodology. No evidence this indicator is being applied.	No major observations.
59	Community level framework implemented for community water management								■					
60	Area of watersheds protected						■						No clear methodology. No evidence on how this indicator is applied.	
61	Local capacity developed in catchment management (water sector)						■							
62	Participatory PES (scheme number, total transactions and area coverage)								■			New indicator.	Not yet applied.	

	Rural feeder roads													
63	Road network (km/km^2)	■											Potential impacts if road network expanded in absence of environmental specifications.	The climate change dimension is foreseen under indicators in STPA2 and the CCLCDS which, to our knowledge, are not being monitored. It is necessary to adopt specifications for feeder roads (including environmental) in order to be able to assess if roads are 'in good condition'.
64	% classified road network in good condition		■										Difficult to assess in absence of adopted specifications.	
65	All-weather roads to priority production areas (km)				■							Positive in terms of climate change adaptation.	No evidence this indicator is being applied.	
66	% road projects having included mitigation measures on the negative impacts on environment							■				Positive to keep check on environmental dimension.	No evidence this indicator is being applied. Questions of EMPs' effectiveness.	
	Water quality / pollution from farming													
67	% of water resources complying with water quality standard			■			■					Necessary indictor. Potential to link with indirect measures of soil erosion (TSS), fertiliser and pesticide use, and agro-industrial activity.	No water quality standards yet adopted in Rwanda. Indicator not yet fully operational.	These are good indicators. However, the baseline should be developed and the monitoring system (sampling points, measurement stations) developed. As well, water quality standards have to be developed. Finally, it should be ensured that at least the following parameters are being measured: TSS, BOD, phosphates, nitrates, nitrites, K, pesticides.
68	Incidences of chemical pollution from farming activities						■					Positive.	No evidence of indicator being applied. No clear methodology; especially tricky as chemical pollution is usually non-point and semi-continuous.	
69	Rate of sedimentation at selected points of major rivers and streams						■					Very positive for indirect measure of soil erosion.	No evidence of indicator being applied.	
	Environmental management from agro-industry													
70	% of sectoral projects that have completed EIA before implementation						■					Positive to keep check on environmental safeguards.	Could be enhanced with indication of EMP effectiveness (or at least evaluation).	No major observations.
71	% of industries using cleaner production technologies						■					Idem.	Idem.	

72	% of coffee washing stations with water recycling						■					Idem.	Idem.	
73	EIA undertaken and approved for each infrastructural development						■					Idem.	Idem.	
74	GHG emissions, water usage (resource efficient industries)								■			Positive in terms of climate change mitigation.	New indicator not yet applied.	
75	No of new green technologies employed (promoting green industries)								■			Idem.	Idem.	
	Climate variability warning systems / insurance													
76	Early warning capability for food shortages				■							Positive in terms of adaptation to climate variability and climate change.	No evidence of this indicator being applied.	The indicators seem to be correct; however, there are concerns about their implementation (linked to monitoring of SPTA2).
77	Weather insurance programme functioning				■							Idem.		
78	Plan for rehabilitating meteorological stations and strengthening networks				■							Idem.		
79	Quarterly update of meteorological / climatic data for ENR planning						■					Idem.		
80	Meteorological data available for inclusion in UNFCCC reporting						■					Idem.		
81	% coverage of early warning systems								■			Idem.	New indicator, not yet being applied.	
	Public sector capacities for environmental management / environmental management capacities													
82	Assessment of training needs and technical capacity building in the agricultural public sector				■							Positive and necessary.	No evidence on how this is being done??	No major observations.

83	Number of DDPs and Imihigo that address environmental mainstreaming issues												Who monitors?	
84	Number of district officials trained in environmental management at local level												Idem.	
85	Community training in environmental management												Idem.	
86	Accessibility and quality of data for GoR decision-making in the areas of food security and sustainable agricultural dev't													
	Other aspects													
87	No. of new products with export market certifications for organic production and other quality attributes (Support given for organic and other quality certifications)													No major observations.
88	Extent to which ENR sustainability principles are applied in key ENR-dependent sectors and economic management institutions													
89	Supply and use of energy-efficient stoves												Positive indirect impact on wood fuel reliance.	
90	Number of biogas systems established in HH													
91	Number of roof rainwater harvesting systems for document use established													

Annex A4: Policy, institutional and regulatory framework

Policy framework and key strategic documents

This section presents an overview of the relevant national policy and strategies that address environment-agriculture linkages. Key policy documents at the national level are: Rwanda Vision 2020 and the Economic Development and Poverty Reduction Strategy (EDPRS). Sectoral ministries then have their respective national policies and sector strategies.

In the context of this SEA, the key sector policies are: the National Agricultural Policy (2004); the National Environmental Policy; the National Land Policy (2004); the National Decentralization Policy; the National Seed Policy (2007); the National Forestry Policy (2010); the National Policy for Water Resources Management (2011) and the Sector Policy on Water and Sanitation (2004). Other indirectly relevant policies include: the Transport Sector Policy (2008) and the National Industrial Policy (2011).

Key sector and sub-sector strategies are: the Strategic Plan for the Transformation of Agriculture II; the Five-Year Strategic Plan for the Environment and Natural Resources Sector (2009-2013); the National Strategy and Action Plan for the Conservation of Biodiversity in Rwanda; the National Agricultural Extension Strategy (2009), the National Adaptation Programme of Action (NAPA); and the National Strategy for Climate Change and Low Carbon Development (2011).

These documents are described below, focusing on the environment-agriculture aspects. In addition to these policy documents Rwanda has an unwritten policy for environmental mainstreaming. This is described below.

Environmental Mainstreaming framework

Vision 2020 and the EDPRS are the basic policy documents at national level. These contain a series of performance indicators, which include some on ENR and agriculture as well as a corresponding M&E framework.

A Common Performance Assessment Framework (CPAF) contains a sub-set of EDPRS indicators, and is used by the Sector Working Groups (SWG) to measure progress. At the ministerial level, sector strategies recall the Vision 2020 and EDPRS indicators, and include a longer set of sector-specific performance indicators, objectives and targets. In the case of ENR, its sector strategy also contains environmental indicators relevant to agriculture.

The different ministries have to submit their budgets to MINECOFIN based on the Budget Call Circular (BCC). The BCC includes "sector specific guidelines for environmental mainstreaming" (Annex 17), with environmental objectives and indicative guidance on prioritised actions for environmental mainstreaming for the agriculture, trade and industry and infrastructure sectors.

The higher-level environmental objectives for the agriculture sector are: (1) ensure a sustainable use of marshland; (2) promote improved soil and water conservation practices; and (3) restore and improve soil fertility and prudent use of agricultural inputs.

The strategy for environmental mainstreaming also includes the secondment of REMA staff to key ministries, as environmental mainstreaming officers, including MINAGRI.

Inter-institutional coordination for environmental mainstreaming is described below (institutional framework).

Rwanda Vision 2020 sets out the long-term vision for Rwanda. One of the six pillars relates directly to the agriculture sector: *"Transformation of agriculture into a productive, high value, marked oriented sector, with forward linkages to other sectors"*. Protection of the environment and sustainable natural resource management is one of the cross-cutting areas of Vision 2020. The vision "aims to replace subsistence farming by a fully monetised, commercial agricultural sector by 2020".

The Vision 2020 identifies a number of agriculture related indicators:

- Indicator 26: Growth rate of the agricultural sector (%)

- Indicator 35: Modernised agricultural land (%)
- Indicator 36: Use of fertilisers (kg/ha/year)
- Indicator 37: Financial credits to the agricultural sector (%)
- Indicator 39: Agricultural production (kcal/day/person) (% needs)
- Indicator 40: Availability of proteins/person/day (% of needs)

It also includes some environmental indicators that are closely associated to the agriculture sector (be it because actions in the agriculture sector could contribute to its attainment and/or because progress in the environmental indicator could help enhance performance in the agriculture sector). These are:

- Ind. 38: Access to clear water (%) (agricultural activities could increase water pollution);
- Ind. 41: Road network (km/km^2) (enhanced road communications will benefit performance in the agriculture sector and could increase soil erosion if not properly designed);
- Ind. 44: Land portion against soil erosion (%) (controlled enhances agricultural productivity);
- Ind. 45: Level of reforestation (ha) (increased reforestation will aid soil erosion control);
- Ind. 46: Wood energy in the national energy consumption (%) (decreased reliance in wood will reduce deforestation, with an indirect effect on enhancing soil erosion control).

The **Economic Development and Poverty Reduction Strategy (EDPRS) 2008-2012** provides a road map and a medium-term framework for achieving the long-term Vision 2020. One priority area under the EDPRS is to "Raise agricultural productivity and ensure food security". The EDPRS recognises the cross-cutting nature of the environment, and the close linkages between environmental quality and national development.

The EDPRS has to become reflected in Sector Strategies and District Development Plans, and thereafter in adequate Medium-Term Expenditure Frameworks (MTEF) for their implementation. Strategic Outcome Indicators, Intermediate Indicators, and a Policy Matrix are defined. The relevant indicators are (notice the lack of environmental indicators):

Intermediate Indicators

- % of agricultural land protected against soil erosion
- Area under irrigation (ha)
- % of farm households using: inorganic mineral fertilisers; organic fertilisers; improved seeds; insecticides
- % of livestock in intensive systems
- Number of farm households per extensionist
- % of classified road network in good condition (indirect effect on agriculture)

The **National Agricultural Policy (2004)** provided the basis, together with Vision 2020 and the EDPRS for SPTA. The main axis centre on: food security based on income generation; modernisation of the sector; shift to market-oriented agriculture; fair distribution of benefits; integrated and diversified agriculture; and 'agriculture friendly to the environment'.

The Policy emphasises crop intensification and promotion of agricultural specialisation. These aspects were later translated into more operational programmes. Other areas of focus with relevance for the environment include: improvement of measures to protect and conserve water and soils; development of marshlands and lowlands subject to flooding; and use of more fertilisers.

The **National Seed Policy (2007)** includes policy orientations on: general framework of the government intervention in the chain (promoting the role of the private sector in seed production and marketing); research and variety development; seed production and conditioning; seed marketing and constitution of seed security stock; promotion of seed use; financing the private sector; seed quality control; seed import and export; coordination and implementation of the seed policy

The **National Environmental Policy** provides a framework for the achievement of the environment-related components of Vision 2020. Some of the aspects it addresses include: improvement of health and

quality of life; rational management and use of resources and the environment; environmental integration in sector planning at all levels; ecosystem preservation and restoration; environmental awareness; and public participation.

Amongst the areas more relevant to agriculture, these include: protection and conservation of soils against degradation (point of convergence with the agriculture policy); water quality protection; conservation and use of wetlands (potential point of conflict with the agriculture policy); forests conservation (point of convergence with the agriculture policy); and conservation of biodiversity.

It is important to highlight that it also includes a number of Strategic Actions addressed to the agriculture sector, for which coordination with MINAGRI is expected:

- develop environment friendly agricultural production systems;
- reactivate agricultural inputs national programmes with a view to increasing agricultural production while complying with environment;
- create awareness among the population on the impact of agricultural inputs;
- relieve the agriculture sector by the creation of non agricultural employments;
- enhance the practice of livestock stabling;
- ensure that animal breeding does not exceed the capacity of grazing land;
- promote environment-oriented irrigation;
- develop off-land animal breeding around towns and along roads;
- regulate the importation of exotic breeds and the movement of domestic animals:
- regulate and improve fishing techniques and methods with consideration to environment.

The **National Policy for Water Resources Management** (2011) replaces the previous 2004 policy, mainly to integrate the new principles embodied in the 2008 Law N°62/2008 on the use, conservation, protection and management of water resources. Key policy principles include integrated water resources management, precautionary principle, stakeholder and user participation and equity of access.

The Policy defines strategic actions, many of which are aimed at implementing Law 62/2008. Amongst these, we may highlight:

- Establish and operationalize a water inter-ministerial coordination committee to co-ordinate water resources management across all sectors of government;
- Monitor and assess water resources to identify its spatial and temporal occurrence and distribution in the country with a special focus on areas vulnerable to water related disasters, including droughts and floods;
- Develop a water resources information system;
- Formulate water quality standards and legal limits for discharges of effluent into natural water courses;
- Formulate principles for the allocation of water resources;
- Institute measures to designate "reserve water", which is an amount of water of appropriate quality reserved for ecological functions and other environmental services and excluded from allocation to other competing uses;
- Institute a system of permits and authorisations for uses of water.

To date the Scope of Work of the IWRM Master Plan is in process of being developed

The **National Land Policy (2004)** has as an objective to establish a land administration and land management system that guarantees secure tenure for all users, promotes productive and sustainable use of rural and urban land resources and ensures protection of the environment. The policy covers aspects such as:

- Mechanisms to procure security and land tenure (which is an incentive to invest in environmental management practices);
- Promote proper allocation of land and proper use of land resources according to land potential;
- Discourage land fragmentation and promote land consolidation (this is integrated into MINAGRI policy and has potential environmental consequences);

- Orient land management towards more profitable and sustainable production;
- Promote techniques to protect land against degradation;
- Sensitise public and promote participation to ensure environmental protection and good practices in land management;
- Ensure sustainable use of wetlands.

Implementation has included comprehensive land resources mapping and suitability assessments.

Sector Policy on Water and Sanitation (2004). The basic tenet for this policy is equitable access to clean water by all, as well as efficient and balanced use on economic production and ecosystem functioning. The water sub-sector policy emphasises sustainable and integrated water resources management and development for multipurpose use. Specific areas of intervention include aspects such as:

- Improved water quality management;
- Improved natural water resources management;
- Increased access to safe water supply for the rural and urban population;
- Protection of water sources.

National Forestry Policy (2010). This new policy has as stated overall goal of the forestry policy, to be: "One of the bedrocks for sustainable development, thriving, developed, managed and utilised for sustainable benefit to all segments of society and the environment". It explicitly addresses the links between forestry and the agriculture sector, and includes one Policy Statement "on Farm Forestry", which considers the following implementation strategies:

- Mainstreaming farm forestry in agricultural policies and strategies;
- Disseminating best practices in farm forestry in all farming systems in Rwanda;
- Enacting and enforcing agricultural bye-laws designed to conserve the life support systems and protect agricultural biodiversity;
- Building capacity of farmers and private sector in favour of farm forestry;
- Intensifying research into suitable farm forestry technologies, niches and tree species for various agro-ecological zones;
- Promoting growing and/or husbandry or multi-purpose trees in all farming systems;
- Re-orienting frontline agricultural extension into farm forestry:
- Developing and amplifying farm forestry content in extension packages and integrating these into a unified extension system for all farming systems in the country;
- Supporting farmer groups to establish and manage tree nurseries for commercial purposes;
- Encouraging schools and other youth organisations to grow and conserve trees;
- Including agroforestry into primary school curriculum:
- Developing training programmes and field manuals for front-line extension agents; and
- Training, re-training and disseminating information to farming households.

The policy recognises the importance of coordinating inter-ministerial issues in the sector, as well as the engagement with local government, which is foreseen to take place through the District Forestry Service (DFS), which will be responsible mainly for forestry extension and capacity building of local communities to engage and intensify agro-forestry.

Implementation is to be based on "Performance Contracts" (PCs). PCs are to be established between the GoR with the National Forestry Authority (NAFA) and between NAFA and each of the Districts. Each PC is to reflect generic policy performance/impact indicators, including on 'maintenance of vital environmental services and conservation of biodiversity'.

National Decentralisation Policy. Rwanda has embarked on a wide-spread decentralisation process, taking heed of the subsidiarity principle. The Policy is implemented through a Decentralisation

Implementation Programme. The Decentralisation Policy has implications for all sectors, including agriculture and ENR, as the District and Sector levels of the administration are taking increasing roles in these areas of development.

Notice that the EC SBS Programme to SPTA2 focuses on its decentralisation dimension.

The **Transport Sector Policy** (2008) is relevant to the agriculture sector in relation to facilitating access to markets for the agricultural products; road infrastructure is also needed in the context of agricultural intensification, as it is an incentive for people to move to urban centres. The Policy emphasises, *inter alia*, the participation of local communities in the management of the sector, particularly in the maintenance of roads and tracks. Amongst the actions foreseen is the establishment of appropriate standards for the construction and maintenance of transport infrastructure, where the environmental dimension (although not explicitly stated), should play a key role.

The **National Industrial Policy** (2011), in promoting industrial development defines ten clusters, amongst which agro-processing is included in those targeted for the short-term. The Industrial Policy should help facilitate the development of agro-industry, but importantly also establishes as one of its policy actions the promotion of environmental sustainability.

Strategic Plan for the Transformation of Agriculture, Phase II (SPTA2) is the agriculture sector plan aimed at achieving EDPRS and Vision 2020 objectives in relation to agriculture. This plan is described above, and contains some environment related indicators.

The **5-year Strategic Plan for the Environment and Natural Resources Sector (2009-2013) (ENR SSP)** is the main strategy in the environment and natural resources (ENR) sector to implement the National Environmental Policy and the ENR components of Vision 2020 and EDPRS. Objectives will be pursued through a series of programmes, plans and activities, including:

- Integrated Land Management Programme (including elements of optimising productive land use and combatting soil erosion);
- Integrated Water Resources Management (IWRM) Programme (including, *inter alia*, institutional and regulatory framework for IWRM, water quality standards, monitoring of water quality & quantity, and watershed protection);
- Forest management and Afforestation Programme (including silviculture and agro-forestry);
- Sustainable mining and increased mineral production.

The ENR SSP includes a series of indicators related to the agriculture sector, as follows:

- Agricultural land use based on land suitability
- Proportion of wetlands conserved/sustainably used (e.g. relevant to marshland reclamation for agriculture promoted under MINAGRI)
- Agro-forestry coverage: proportion of farmed land under agro-forestry

The Results Management Framework for the ENR SSP includes the following indicators:

- % annual increase in land secured against erosion
- Smallholder irrigation schemes in water scarce areas (Bugesera, Umutara, Muhanga, Huye)
- % of coffee washing stations with water recycling
- % of farmers cultivating drought-tolerant and low water consuming crop varieties

The **National Agricultural Extension Strategy** (2009) proposes a new model for extension services, focused on improving farmers' income rather than agricultural productivity. In consistency with the decentralisation policy, MINALOC 'owns' the agricultural extension service, although there is close coordination with MINAGRI and its attached bodies. The agricultural extension strategy is particularly important, as it can be a vehicle for the implementation of some SEA recommendations dealing more in particular with farmers' know-how and capacities.

The **National Strategy and Action Plan for the Conservation of Biodiversity in Rwanda** was prepared in compliance with the international commitments to the UN Convention on Biological Diversity (CBD). It has some objectives which have are very closely related to the agriculture sector. Amongst these: a strong focus on protection of wetlands (which could be in conflict with the policy of reclaiming marshlands for agriculture); sustainable use of agro-biodiversity (which could be in conflict with the crop intensification policy); and risk-free biotechnology (which could be in conflict with the crop intensification policy with regards to the possible introduction of GMO seeds).

National Adaptation Programme of Action (NAPA) (2006) The NAPA is prepared in the context of the United Nations Framework Convention on Climate Change (UNFCCC). The NAPA is meant to guide policy making and planning processes on priorities in economic sectors vulnerable to climate change (such as agriculture), as well as on strategies and priority actions of climate change adaptation.

This was a first policy document that eventually helped the preparation of the National Strategy for Climate Change and Low Carbon Development (of 2011).

The **National Strategy for Climate Change and Low Carbon Development (2011)** (NSCCLCD) oriented towards a Vision for 2050: "For Rwanda to be a developed climate-resilient, low-carbon economy by 2050". It is based of three Strategic Objectives, as follows: (1) to achieve energy security and a low carbon energy supply that supports the development of green industry and services; (2) to achieve sustainable land use and water resources management that results in food security, appropriate urban development and preservation of biodiversity and ecosystem services; (3) to achieve social protection, improved health and disaster risk reduction that reduces vulnerability to climate change.

14 Programmes of Action are set out with corresponding performance indicators, many of which have implications for the agriculture sector. The most relevant to the purposes of this SEA are synthesised below.

Programme 1: Sustainable Intensification of Agriculture	
Actions	**Indicators**
1. Mainstreaming of agro-ecology	% of farms up-taking agro-ecology technologies
2. Resource recovery and reuse	Volume of waste reduction / Compost production
3. Fertiliser enriched compost	% of farms applying fertiliser rich compost
4. Mainstreaming of "push-pull" strategies	% of farms up-taking "push-pull" strategies
Programme 2: Agricultural diversity in local and export markets	
Actions	**Indicators**
1. Expansion of crop varieties	% of farms adopting crops
Programme 3: Integrated water resources management	
Actions	**Indicators**
2. Community water management	Community level framework implemented
Programme 7: Green industry and private sector development	
Actions	**Indicators**
1. Resource efficient industries	GHG emissions, water usage
3. Promoting green technologies	No. of new green technologies employed
Programme 11: Ecotourism, conservation and payment for ecosystem services	
Actions	**Indicators**
3. Participatory PES	Scheme number; total transactions & area coverage
Programme 12: Sustainable forestry, agroforestry and biomass energy	

Actions	Indicators
1. Improved afforestation/reforestation	Survival rates and area coverage of tress planted
3. Joint agroforestry strategy	Biomass energy security of smallholder households
Programme 13: Disaster management and disease prevention	
Actions	**Indicators**
2. Integrated early-warning system	% coverage of early warning system

Policies relevant to the Feeder Roads SPSP include: the National Social Protection Strategy (2011); the Community Development Policy (2008); and the National Labour-intensive Public Works Strategy (2008). Other relevant policies include the Fertilisers Policy.

Institutional framework

Strategic level stakeholders

The key sector authority dealing with agriculture is the Ministry of Agriculture and Animal Resources (MINAGRI), which was responsible for the preparation of SPAT2, and is also responsible for its implementation and monitoring.

From an ENR point of view, key institutions who constitute strategic level stakeholders in the subject matter of this study are: Ministry of Natural Resources (MINIRENA), dealing with policy aspects; Rwanda Environmental Management Authority (REMA), which is the regulatory agency; and Rwanda Natural Resources Authority (RNRA), in charge of implementation.

Other relevant institutions include: the Ministry of Local Authorities (MINALOC); the Ministry of Infrastructure (MININFRA); the Ministry of Trade and Commerce (MINICOM); the Rwanda Agriculture Board (RAB); the Rwanda Development Board (RDB); and the Ministry of Economy and Finance (MINECOFIN). At the local level, key institutions are the Province and District authorities. These key government institutions are briefly described above, in so far as they are relevant to addressing environment-agriculture links.

As well, there are mechanisms in place in Rwanda to guarantee inter-institutional coordination that is useful to mainstream the environment in sectoral policies and strategies.

The PM chairs the Integrated Development Programme (IDP) core committee of 5 Ministers: MINECOFIN, MINALOC, MINAGRI, MINIRENA and MINICOM. This is the most senior committee focussing on Decentralisation. Much of the focus of effort on decentralisation has so far been in the area of administrative and fiscal management capacity.

A broader Joint Delivery Committee (JDC) responsible for implementation of IDP is chaired by the Minister of Local Government and includes all Ministers. Other mechanisms include the Sector Working Groups (SWG), Imihigo and the Budget Call Circular (BCC).

Key relevant government institutions – Local/activity level

District Councils and Mayors are elected bodies at the local level, and thus constitute the key institutions for planning and implementation. The organisation and functioning of the District is specified in Law N°08/2006 of 24/02/2006.

Under the Decentralisation Policy Districts enjoy a large degree of autonomy. They prepare their own budget and have their own revenue, although they also receive funds from the central government. Districts are responsible for implementation of measures in agriculture and ENR which are consistent with the corresponding sectoral policies and strategies, and contribute to achievement of EDPRS and

Vision 2020 objectives and MDGs. The Province level is the body that helps ensure adequate coordination with the central government.

District Environmental Committees are established at the district, sector and cell levels, and assume responsibilities on certain environmental aspects, including on monitoring of forestry activities, soil erosion control measures and general environmental management.

Inter-institutional arrangements for environmental mainstreaming

There are five main fora that provide significant opportunities for mainstreaming the environment into the agriculture sector (policy-making, planning and implementation). These are: (1) the Integrated Development Programme (IDP); (2) the Sector Working Groups (SWG); (3) the Budget Call Circular (BCC); and (4) Imihgo.

Integrated Development Programmes (IDP) are "implementation frameworks for significant components of the EDPRS which will be implemented almost exclusively at the local community levels and engage a wide range of stakeholders". The IDP is overseen by an Inter-Ministerial Steering Committee (IMSC) comprising key line ministries and chaired by MINALOC.

Sector Working Groups (SWG) are established by the government and provide a forum for dialogue between different government institutions and donors. There is one SWG on Agriculture as well as one SWG on Environment and Natural Resources (ENR). However SWGs have wide inter-institutional representation so, for example, MINIRENA and REMA form part of the Agriculture SWG.

SWGs meet on a monthly basis and report progress on a bi-annual basis. The autumn report is 'backward looking', i.e. focusing on a review of the year's activities, whereas the spring report is 'forward looking', i.e. focusing on changes required for the coming fiscal year. The Agriculture sector group is currently chaired by MINAGRI and co-chaired by the World Bank, whereas the ENR SWG is chaired by MINIRENA and co-chaired by SIDA. In cases where inter-sector coordination is required, Joint Action Plans (JAP) can be prepared.

Budget Call Circular (BCC). Ministries have to elaborate their budgets based on BCC guidance provided by MINECOFIN. Recently such guidance has included a component on environmental mainstreaming, which contains high-level objectives and ideas of policy actions for three sectors, including agriculture. Thus MINAGRI has to show how environmental mainstreaming is reflected in its proposed budget.

This environmental mainstreaming guidance was originally prepared by MINIRENA with support of the UN's Poverty-Environment Initiative (PEI), becoming a way to translate environmental objectives in the agriculture sector down to MINAGRI via MINECOFIN.

Imihigo is as old as pre-colonial Rwanda. Imihigo is a cultural practice in the ancient tradition of Rwanda where an individual would set himself/herself targets to be achieved within a specific period of time and to do so by following some principles and having determination to overcome the possible challenges.

In the modern day Rwanda, the Imihigo practice was adopted as a means of planning to accelerate the progress towards economic development and poverty reduction. Imihigo has a strong focus on results, which makes it an invaluable tool in the planning, accountability and monitoring and evaluation processes.

One of the key tools introduced by the GoR in 2006 for reinforcing the local government was the performance-based approach, "Imihigo". Through this approach local governments articulate their own objectives, which reflect priorities of the local population and develop realistic strategies to achieve these objectives. Performance Contracts are signed each year between districts and the central government and between districts and lower-level local governments. The contracts also commit the central government to support the local level in technical and financial terms. Reports are submitted by districts on a monthly basis to MINALOC, and quarterly reports are submitted to the President of the Republic.

Multilateral Environmental Agreements

Rwanda is party to a number of international and regional multilateral environmental agreements, which establish compromises for environmental protection. Some of these international commitments have already been reflected in the form of national strategic documents (e.g. for biodiversity and for climate change).

The main international and regional multilateral environmental agreements ratified by Rwanda, and more relevant to the agriculture sector, are:

- United Nations Framework Convention on Climate Change (UNFCCC) and its associated Kyoto Protocol. Under this convention Rwanda prepared its NAPA and its Strategy for Climate Change and Low Carbon Development.
- United Nations Convention on Biological Diversity (CBD). Under this convention Rwanda prepared its National Strategy and Action Plan for the Conservation of Biodiversity.
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).
- United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD), in response to which Rwanda prepared a National Action Plan to Combat Desertification.

National Legislative framework

Rwanda has a limited body of environmental legislation, and is in the process of developing new relevant laws and regulations. This section provides an overview of the main pieces of legislation relevant to the ENR and agriculture sectors.

Legislation	Relevance to the SEA
Organic Law N°08/2005 of 14/0772005 determining the use and management of land in Rwanda	Framework law that establishes the types of land ownership and institutional attributions. It establishes the possibility of land consolidation.
Organic Law N°04/2005 of 08/04/2005 determining the modalities of protection, conservation and promotion of environment in Rwanda	Establishes provisions relevant to, *inter alia*: soil management (e.g. prevent soil use that discourages rotation, Art. 12); mandatory waste water treatment before effluent release (Art. 18, relevant to agro-industrial activities); special protection to swamps (Art. 29); waste management (Art. 32-35); prohibition of burning for agriculture or organising grazing land (Art. 38); obligation of the State to establish soil erosion control and soil pollution control measures (Art. 51); establishes responsibilities of decentralised entities over, e.g. land management and soil erosion control, afforestation, and management of swamps (Art. 61); the EIA system (Chapter IV) and control, monitoring and inspection (Title V).
Law N°62/2008 of 10/09/2008 putting in place the use, conservation, protection and management of water resources regulations	Establishes some basic principles and responsibilities for water management relevant to the agriculture sector, including: (1) calls for the establishment, in the PM's office of a Water Inter-ministerial Committee composed of ministerial department representatives concerned with water in their domain; (b) devolves water resources management functions to the district level and user organisations. In calls for the establishment of a Basin District and a Basin Sector Committee. It allows for the constitution of water users associations; (c) calls for the establishment of a national water inventory, as well as a national water master plan; (d) provides for charges to be levied on water use; (e) establishes that installations and activities relative to

	water use that may impact water quantity or quality, or affect wetlands, are subject to authorisations at the Ministerial level; and (f) calls for the Minister to maintain and update an inventory of wetlands, indicating their location and features, especially those with a protection status.
Ministerial Order relating to the requirements and procedures for EIA (2008)	Establishes the procedures for EIA, which are relevant to all major projects in the agriculture sector, including feeder roads, marshland development and irrigation schemes.
Ministerial Order establishing modalities of inspecting companies or activities that pollute the environment (2008)	Establishes procedures for REMA to undertake inspection activities to verify compliance with environmental regulations. Enforcement is based mainly on inspections rather than on self-monitoring and reporting by industry.
Prime Minister's Order N°26/03 (2008) determining the list of chemicals and other prohibited pollutants	Establishes list of banned agrochemical products (basically pesticides), and thus provides a basic safeguard for management of pesticides.
Ministerial Order N°003/16.01 of 15/07/2010 preventing activities that pollute the atmosphere	Of indirect relevance to this SEA, as atmospheric pollution is not a key concern. However, useful to take into account in case of agro-industrial activities where atmospheric emissions could be an issue.
Ministerial Order N°007/2008 of 15/08/2008 establishing the list of protected animal and plant species	Of indirect relevance, as it provides a framework to the environmental authorities for the authorisation of agricultural activities based on their potential impacts to flora and fauna.
Prime Ministerial Order N° 126/03 of 25/10/2010 determining the responsibilities, organization and functioning of committees in charge of the environment conservation and protection	Defines responsibilities of the Environmental Committees at district, sector and cell levels, which include, *inter alia*, aspects related to: monitoring of forests management; ensure monitoring of management of marshlands; M&E of environmental policies and programmes; ensure strategies against soil erosion are executed (sector and cell levels); ensure tree planting (cell level).

In addition to the above legislation, the **Law on Agrochemicals** is currently at Cabinet awaiting approval. WTO has been assisting Rwanda with the Rwanda Horticultural Export Standards Initiative. The Agro-chemicals Law will enforce safeguards. MINAGRI's Directorate of Inspection Services will need to quantify 'baselines' and maximum residue limits of chemicals based on internationally credible practices in nearby African nations. Adoption and successful application of such practices would ensure that pesticides were not a significant threat to the environment, compared with other issues.

The revised bill for **Soil Erosion Law** is at Cabinet for review. Ministerial guidelines for district officials for implementation of the soil erosion law are already in circulation.

Environmental standards have been adopted at a national level for effluent discharges.

As recited in the ToR, REMA has produced Guidelines and Procedures both for Environmental Impact Assessment (EIA) and SEA. These are useful to interpreting the environmental regulations: General Guidelines and Procedures for Strategic Environmental Assessment (SEA), REMA, June 2011; and General Guidelines and Procedures for Environmental Impact Assessment (EIA), REMA, November 2006.

Annex B5.1: Complementary information on soil erosion

The REMA/PEI (2006) *Economic Analysis of Natural Resource Management in Rwanda* report provides an overview of the relationships between soil erosion and agricultural productivity, as gathered from various sources. This is synthesised in the following paragraphs:

On average 27% of cultivated land is on slopes larger than 20º, 23% on slopes between 10-20º, 16% on slopes between 5-10 degrees and 34% on slopes between 0-5º[1]. The loss of humus is approximately 10.1 tonnes per ha, but can be as high as 36 tonnes per ha on 5% of soils, and more than 68 tonnes per ha on 1% of the soil[2].

The REMA/PEI report quotes a number of sources that relate decline in agricultural productivity to soil erosion; for example, land productivity on very eroded farms is reported to be 21% lower than on farms with little erosion. Other studies point in the same direction, e.g. up to 80% of households in hilly areas such as Ruhegeri are experiencing a decline in productivity related to soil erosion[3]. Over-cultivation is considered to be another of the major causes in the decline in productivity, together with soil erosion. Needless to say, other factors, such as agricultural inputs (fertilisers) have a direct incidence on productivity (although not necessarily on productivity decline).

Soil erosion rates by districts (source: UNEP, 2011)

Erosion rates (tonnes/ha/yr)	Bugesera District		Burera District		Gakenke District		Gasabo District		Gatsibo District	
	Area (km^2)	% distr. area	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. area
0-30	6	0.47	3	1	-	-	0	0	20	1
30-50	271	21	92	14	4	1	11	2	429	27
50-100	677	52	349	54	327	46	267	62	716	45
100-150	253	20	140	22	370	52	150	35	372	24
150-300	-	-	0.06	0.01	1	0.14	0	0	0	0
Water bodies	69	5	59	9	2	0.32	1	0.34	45	3
Erosion rates (tonnes/ha/yr)	**Gicumbi District**		**Gisagara District**		**Huye District**		**Kamonyi District**		**Karongi District**	
	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. area
0-30	1	0.07	0	0	-	-	0.39	0.06	1	0.07
30-50	54	7	41	6	14	2	32	5	12	1
50-100	506	61	338	50	294	51	302	46	316	32
100-150	267	32	284	42	273	47	320	49	458	46
150-300	0.13	0.02	0	0	1	0.09	-	-	7	1
Water bodies	2	0.28	1	0.08	-	-	1	0.18	199	20
Erosion rates (tonnes/ha/yr)	**Kayonza District**		**Kicukiro District**		**Kirehe District**		**Muhanga District**		**Musanze District**	
	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. Area	Area (km^2)	% distr. area
0-30	32	2	0.02	0.01	15	1	-	-	0.03	0.01
30-50	780	40	26	15	310	26	5	1	46	9
50-100	797	41	86	52	650	55	318	49	401	76
100-150	155	8	53	32	157	13	324	50	65	12
150-300	-	-	-	-	-	-	0	0	-	-

[1] Clay and Lewis (1996) cited in economic analysis of NRM
[2] Baechler (1999) cited in REMA/PEI (2006).
[3] Musahara (2006) cited in State of the Environment and Outlook Report 2009.

Water bodies	167	9	1	1	31	3	1	0.22	18	3
Erosion rates (tonnes/ha/yr)	**Ngoma District**		**Ngororero District**		**Nyabihu District**		**Nyagatare District**		**Nyamagabe Distr.**	
	Area (km^2)	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. area**
0-30	3	0.36	-	-	-	-	29	2	-	-
30-50	150	17	10	2	43	8	451	23	1	0.08
50-100	465	54	300	44	302	57	947	49	414	38
100-150	190	22	366	54	185	35	477	25	647	59
150-300	-	-	1	0.08	0.05	0.01	-	-	28	3
Water bodies	56	6	2	0.28	1	0.28	12	1	0	0
Erosion rates (tonnes/ha/yr)	**Nyamasheke Dist.**		**Nyanza District**		**Nyarugenge Dist.**		**Nyagurugu Distr.**		**Rubavu District**	
	Area (km^2)	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. area**
0-30	0	0	0	0	0.43	0.32	-	-	0.12	0.03
30-50	16	1	25	4	13	10	3	0.26	31	8
50-100	441	38	391	58	86	64	344	34	283	73
100-150	484	41	254	38	32	24	592	59	26	7
150-300	9	1	0	0	0	0	57	6	0	0
Water bodies	224	19	0.38	0.06	2	2	-	-	47	12
Erosion rates (tonnes/ha/yr)	**Ruhango District**		**Rulindo District**		**Rusizi District**		**Rutsiro District**		**Rwamagana Dist.**	
	Area (km^2)	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. Area**	**Area (km^2)**	**% distr. area**
0-30	-	-	0	0	-	-	0.18	0.02	1	0.17
30-50	10	2	24	4	8	1	28	2	27	4
50-100	282	45	244	43	364	38	391	34	354	52
100-150	334	53	295	52	489	51	238	21	273	40
150-300	-	-	2	0.41	36	4	0.15	0.01	-	-
Water bodies	1	0.14	1	0.15	42	4	498	43	27	4

In terms of soil erosion control measures, the 2008 National Agricultural Survey (NISR, 2010) reports data for total area of agricultural land by province and district according to the main method used for erosion control. This information is synthesised below by Province.

Area (ha) of agricultural land by province according to the main method used for erosion control

Province	Radical terraces (ha)	Anti-erosion ditches (ha)	Anti-erosion hedges (ha)	Without anti-erosion measures (ha)	Rate (under agric. farms)
Kigali	625	7,633	6,397	15,541	41.4%
South	8,079	191,746	35,085	77,580	52.4%
West	4,934	102,223	52,760	105,335	45.1%
North	7,931	63,694	63,665	61,592	60.1%
East	11,629	140,237	70,248	178,157	42.3%
Rwanda	**33,006**	**503,549**	**230,201**	**438,335**	**47.6%**

The KWAMP project is based in the Kirehe District (Eastern Province). As part of its Soil and Water Conservation (SWC) component it has developed 11,924 ha of anti-erosive trenches hedged with

pennisetum hedges (out of 25,000 ha planned)[4]. However its SWC activities have been put on hold due to the requirement by MINAGRI to use the Land Husbandry Technologies (LHT) that were developed by the LWH project for SWC in all watersheds. Appraisal by KWAMP experts have established that LHT is much more expensive (in the order of RWF 400,000-1,200,000 per ha) than the techniques used in KWAMP (around 103,000 RWF per ha). The LHT measures are shown in the table below.

Land husbandry measures by slope category

	Slope Category	Land husbandry measures
1	Nearly level to strongly undulating (slope 0-6%)	1. Grass strips/trash lines (~1 km/ha) 2. Agro-forestry interventions 3. Applying manure/compost at the rate of 10 tons/ha & mulching 4. Applying manure/compost at the rate of 10 tons/ha & mulching
2	Gently rolling to strongly rolling (slope 6-16%)	1. Construction of soil bunds (1 km/ha) (level or graded as per agro-climatic zone) 2. Planting trees/shrubs along the lower side supporting the bunds 3. Inter-cropping and green manure 4. Applying manure/compost at 10 tons/ha and mulching
3	Hilly to steep (slope 16-40%)	1. Constructing Bench (radical) terraces (~1 km/ha) 2. Planting trees/shrubs along the lower side supporting the radical terraces 3. Inter-cropping and green manure 4. Liming with agricultural lime at 2.5 tons/ha 5. Applying manure/compost at 10 tons/ha and mulching
4	Very steep (slope 40-60%)	1. Constructing progressive terraces (~5 km/ha) 2. Inter-cropping and green manure
5	Extremely steep (slope 60-120%)	1. Constructing micro-basins with tree planting pits at 1000/ha 2. Planting tree seedlings (reforestation) at 1000/ha

The LWH project (supported by the WB, USAID, CIDA and JICA) has as an objective to achieve 12,000 ha in hill-side irrigation and 18,500 ha for comprehensive land husbandry activities in the 2010-2013 period in Karongi, Rutsiro, Nyanza and Gatsibo. Combatting soil erosion is one if its key components.

The Rural Sector Support Project (RSSP – financed mainly by the WB) is currently in its second phase[5]. One of the Key Performance Indicators is that "50% of farmers in marshland and hillside areas…have adopted sustainable marshland or hillside intensification technologies". Adoption of sustainable intensification technologies is defined as adoption of at least two of the following practices: "soil fertility management including appropriate use of organic and/or inorganic fertiliser, IPM, conservation tillage, contour bunding, construction of erosion control structures including terraces, vegetation strips, and agroforestry practices".

Soil erosion protection activities are also being implemented as part of the Bugesera Agricultural Development Support Project (PADAB), carried out with the AfDB.

[4] IFAD (2011).
[5] The first phase focused on building technical and institutional capacities required for sustainable intensification of marshlands and hillside agriculture, as well as development of post-harvest and value-adding activities.

Annex B5.2: Prioritisation of Districts based on % land of slope exceeding 16% Slope (SAFEGE, November 2011)

		National and Districts' Area Coverage (Ha) of Five Slope Categories									
No	Slope category	0-6%	6-16%	16-40%	40-60%	>60%	Total	>40%	>40%	>16%	>16%
	Colour code							+>	% land in the	+>	% land in the
	District							(Ha)	District	(Ha)	District
1	Ngororero	2,110	9,056	45,019	11,296	417	**67,899**	11,713	**17**	56,732	**84**
2	Gakenke	3,047	10,441	39,786	15,535	1,597	**70,406**	17,131	**24**	56,918	**81**
3	Rulindo	4,006	8,925	29,320	13,364	1,084	**56,698**	14,448	**25**	43,768	**77**
4	Gicumbi	5507	13525	45016	17927	955	**82,930**	18,883	**23**	63,898	**77**
5	Karongi	3,294	15,369	50,574	9,476	507	**79,220**	9,983	**13**	60,557	**76**
6	Rutsiro	2,889	14,002	42,215	5,967	345	**65,419**	6,312	**10**	48,527	**74**
7	Muhanga	3,564	14,459	36,965	8,233	1,551	**64,771**	9,784	**15**	46,748	**72**
8	Nyabihu	5939	9208	27943	9308	732	**53,130**	10,039	**19**	37,983	**71**
9	Nyamagabe	5,896	25,677	67,869	9,158	436	**109,036**	9,594	**9**	77,463	**71**
10	Nyamasheke	6628	22739	54900	9374	889	**94,530**	10,262	**11**	65,162	**69**
11	Nyaruguru	6,153	26,070	63,826	4,774	95	**100,918**	4,869	**5**	68,695	**68**
12	Rusizi	9,086	22,233	48,416	8,995	1,680	**90,411**	10,676	**12**	59,092	**65**
13	Burera	17,019	12,114	23,957	10,131	1,125	**64,346**	11,256	**17**	35,213	**55**
14	Huye	5655	22580	27748	2102	68	**58,153**	2,169	**4**	29,918	**51**
15	Gasabo	5,277	15,690	19,190	2,634	128	**42,919**	2,762	**6**	21,952	**51**
16	Nyarugenge	2842	3794	5814	893	52	**13,395**	946	**7**	6,760	**50**
17	Gisagara	11,676	23,378	31,862	904	3	**67,823**	907	**1**	32,769	**48**
18	Kamonyi	8,886	25,749	28,706	2,057	154	**65,553**	2,211	**3**	30,917	**47**
19	Nyanza	9,344	31,436	24,838	1,523	60	**67,201**	1,583	**2**	26,421	**39**
20	Musanze	18473	15062	15669	3128	613	**52,945**	3,741	**7**	19,410	**37**
21	Ruhango	8,295	31,956	21,511	894	22	**62,678**	916	**1**	22,427	**36**
22	Rubavu	12,857	9,618	9,537	1,858	164	**34,035**	2,022	**6**	11,559	**34**
23	Kirehe	39,234	45,463	32,237	1,319	69	**118,322**	1,388	**1**	33,625	**28**
24	Rwamagana	15,102	34,635	17,911	539	9	**68,196**	548	**1**	18,459	**27**
25	Gatsibo	48688	66955	37776	4525	246	**158,191**	4,772	**3**	42,548	**27**
26	Ngoma	30,272	33,992	21,883	610	2	**86,760**	613	**1**	22,496	**26**
27	Kayonza	86578	64165	41275	1412	31	**193,461**	1,443	**1**	42,718	**22**
28	Kicukiro	5,623	8,266	2,760	22	-	**16,671**	22	**0**	2,782	**17**
29	Nyagatare	71,945	98,248	17,167	3,858	564	**191,782**	4,422	**2**	21,589	**11**
30	Bugesera	70290	54150	4555	4555	16	**133,566**	4,571	**3**	9,126	**7**
NATIONAL TOTALS		**526,177**	**788,957**	**936,245**	**166,372**	**13,615**	**2,431,366**	**179,987**	**7**	**1,116,232**	**46**
NATIONAL PERCENT'		**21.64**	**32.45**	**38.51**	**6.84**	**0.56**	**100.00**		**7**		**46**
	Slope category	0-6%	6-16%	16-40%	40-60%	>60%		>40%	>40%	>16%	>16%
	Colour code							+>	% land	+>	% land

Annex B9.8: Memorandum from the SEA Team to the RFR SPSP Formulation Team and EU 18/12/2011

From: John Pratt [mailto:consultjohnp@btinternet.com]
Sent: 18 December 2011 15:24
To: CADILLA FALCO Jordi (EEAS-KIGALI) (Jordi.CADILLA-FALCO@eeas.europa.eu); KUBACH Tarik (EEAS-KIGALI)
Cc: Alexis Gakuba; Juan (jn.palerm@gmail.com); John Pratt; ZURDO Diego (EEAS-KIGALI); 'king boen tan'; Duraisaminathan, V
Subject: Draft recommendations from Agricuture SEA Team for SEA of Rural Feeder Roads

……..

I. We refer to our ToR Sections 2.3.2.d) Analysis of performance indicators, 2.3.2.e) Assessment of capacities to address environmental challenges and 2.3.2.g) Conclusion and recommendations; and to the following listed documents and recent discussions:

A. ToR_RWANDA 10th EDF MTR - SPSP RuralFeederRoads FORMUL STUDY ToRs _ 120911corrig.pdf

The Main Report is required to include coverage of (among other things) the following, where we have highlighted matters that especially interested us:

3.5. Institutional assessment and capacity development
Consistency of the institutional framework
· What are the relationships between the main sector institutions and organizations?
· What are the relationships between these institutions/organizations and the other stakeholders?
· What are the inconsistencies or duplication between the responsibilities of key institutions?
· How is the regulatory framework for the sector defined?
· To what extent are the institutional arrangements defined to ensure effective service delivery in the sector?
· To what extent are the institutional arrangements defined to ensure effective decentralization of service delivery?
Organizational capacity of key institutions
· What is the capacity of the sector key institutions to steer and implement the sector policy including planning, procurement, monitoring, internal and external *(sic: ENVIRONMENTAL?)* auditing?
· What is the capacity of local administrations to comply with their responsibilities?
· What is the technical*(sic: ENVIRONMENTAL?)* and financial capacity of the private sector to deliver the requested
services?

5.5 Crosscutting issues
Where appropriate, description of the extent to which, and how, the proposed SPSP takes into account environmental sustainability, gender equity, human rights and good governance issues.

B. **Environmental Aspects of Feeder Roads in RwandaKBTND041211.docx** (our suffix to filename)

Under 'ENVIRONMENTAL ISSUES', We consider the section dealing with 'Drainage' does not need supplementation;
We consider the section on 'Slope Stabilisation' and 'Mitigation measures' require our supplementation;
Under 'CONTRACTOR'S ENVIRONMENTAL MANAGEMENT PLAN (CEMP)' we feel all the sections are well constructed but we offer some supplementary recommendations

C. 20111207 SUMMARY of Final Report (KBT) revJCF.docx

No comment. Noted that "• Environmental issues will be promoted by incorporating the environmental impact assessment and mitigation measures in the feasibility and design stages, by implementing the contractor's environmental management plan and by effectively monitoring the environmental aspects during the rehabilitation works."

D. Interim Report Draft 2011-273049 091211 Ver Pre-Final ATKINS + JCF.docx

No comment except that, as expressed in meeting 12/12/11, REMA and MINICOM should be members of "Programme Steering Committee
(once in 3 months)
Chaired by MINAGRI, co-chaired by MININFRA
Representatives of, MINALOC, MINECOFIN, Districts Reps. and EUD" (we believe our comment was adopted)

E. **Logical Framework(1).docx** version 11/12/2011

"Result 1 Activity 2 Address the cross-cutting issues (environment, gender, health and safety and HIV/AIDS) during feasibility study and rehabilitation stages" which requires our supplementation .

F. Three PowerPoint Presentations of both 12 and 13/12/11

No comment; addressed above

II. Our provisional recommendations towards sector programme enhancement, subject to finalisation in our Agriculture SEA Report (based on analysis and consolidation of Issues) are as follows:

SYSTEMIC RECOMMENDATIONS

1. REMA capacity to apply and enforce the Environmental Management Plan component of EIAs' needs to be strengthened not only for roads but other developments in the agri-sector – **100% effectiveness required by December 2013;**

   We offer attached a non-exhaustive draft Environmental Screening Checklist that may facilitate EIA implementation for Rural Feeder Roads;

2. As previously stated, REMA should sit in the PSC

3. The new post of **Lands and Infrastructure Officer needs to be instituted in all 416 Sectors** (not only in sectors of the Districts where EU SPSP/SBS is supporting RFR) for numerous reasons to be presented in our Report – **100% effective by December 2014**;

TECHNICAL RECOMMENDATIONS

4. The Code of Practice and actual management systems of A) Supervising Engineers (who certify BOQ; quality of work; payments, etc) and B) Road Rehabilitation ***and*** Maintenance Contractors need to incorporate Environmental Capability which includes capability related to the issues set out below at 5. and 6 – **pre-condition to disbursement.**

5. The adopted Road Standard(s) must incorporate rigorous guidance and specifications for Vegetative Protection of Water Courses, Verges, Embankments and Cuttings and other earthen structures associated with RFR rehabilitation and maintenance, according to soil type and other geological and hydrological considerations – **pre-condition to disbursement.**

6. Considering the National Adaptation Programme of Action (NAPA) and the National Strategy for Climate Change and Low Carbon Development (NSCCLCD) which noted "the terrain and climate, characterised by hills and intense bursts of precipitation" and under Programme 9 has "Action 3: Investment in infrastructure
The quality of transport infrastructure not only affects the efficiency of the transport system, but also its resilience to climatic impacts. Improved infrastructure, such as road surface,...." , we recommend that minimum road specifications applied to the respective implementation require climate-proofing road design, so it and associated structures can in particular sustain greater intensity of rainfall as may be indicated by any officially recorded trends generated by official hydro-agro-meteorologic information systems – **pre-condition to disbursement.**

7. In the event that MININFRA and RTDA deviate from the current adoption of a 4 m standard carriageway width (commensurate with most existing RFR carriageway widths), we would assert that (see our 12/12/2011 Note): ***there would be need to place disbursements in suspense and:***

Prepare a completely new road design profile
Redefine the safe buffer zone (forestry, etc)
Redraw and re-survey/register private property boundaries
Recalculate environmental impacts, e.g. more run-off; more murram road fill/km.

This completes our available recommendations at this stage.

Kind regards

John Pratt

Team Leader *Rwanda 17 October – 22 December 2011*
Strategic Environmental Assessment of the Agriculture Sector in Rwanda

Initial Environmental Screening

Screening Questions	No	Yes	If Yes, assessment of significance and recommended mitigation measures
Flora and fauna			
Is the project area adjacent to or within an environmentally sensitive area such as a protected area, biodiversity hotspot or equivalent			
Will the project result in the fragmentation or severance of areas of important natural habitat?			
Will the project impact on any of the following:			
Habitat of species that have local, regional or national importance?			
Habitat for nationally or locally important flora?			
Areas of remnant natural vegetation?			
Cultural Heritage			
Is the project located close to any of the following?			
An archaeological site or monument			
A mosque, graves or cemeteries?			
Groundwater			
Will there be any impact on any springs within the project area?			
Will any wells be impacted by the project?			
Are there any groundwater recharge areas downstream that will be affected by the change in flow regimes?			

Are there any groundwater dependent ecosystems in the study area?			
Surface Water			
Will the project affect downstream water users?			
Is there potential for conflicts on water supply rights?			
Will any downstream ecosystems be affected by changes in flow regimes?			
Geology and Soils			
is there potential for erosion?			
Land Use & Agriculture			
Is there loss of good quality agricultural land?			
Will there need to be significant changes in land use?			
Social & Resettlement Issues			
Will the project require the resettlement of any affected households?			
Will the project result in the severance of roads, footpaths, stock routes or other access issues?			
Will any services need to be relocated?			

AG

Annex B13.1: Deployment of Human Resources at District level: Agriculture and ENR

DEPLOYMENT OF HUMAN RESOURCES IN PUBLIC SECTOR BODIES FOR ENVIRONMENT, AGRICULTURE AND LIVESTOCK (EAL)

							UTUGARI	UMUDUGUDU
	NATIONAL		PROVINCIAL		DISTRICT	SECTOR	CELL	VILLAGE
	MINISTRY	AGENCY		Units/District*:	1	13.9	71.5	?
						RAB Sector Livestock/ Veterinary Assistant		
	MINAGRI	RAB	RAB-LIVESTOCK		RAB Livestock Officer			
			RAB-NRM		RAB CIP Officer (seasonal)............	*with CIP private service provider e.g.IMBARAGA*		
			RAB-CIP					
			RAB-PLANT PROTECTION					
			RAB-AGRONOMY		Agronomist	Agronomist		
			RAB-AGRO-FORESTRY					
		NAEB						
	MINIRENA	REMA			Environment Officer			
		RNRA (Forestry; Water Resources)				0.5 RNRA Forestry Officer	(i.e. one for two Sectors)	
					Forester			
					Lands Officer			
	MINICOM	RDB			Cooperatives Officer	Coops O (W only)		
		RBS				*needed post:*		
						Land and Infrastructure?		
	MININFRA	EWSA			*Infrastructure Officer?*			
		RTDA						
	MINIJUST	PRISONS/TIG						
							Integrated Development Plan/Social Development Officer	
	MINALOC<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<							
					Vice-Mayor Economic Development & Finance (*elected*)			
						Executive Secretary - part time?	*Executive Secretary - part time?*	
	PRESIDENCY<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<				*Secretary - Joint Action Decvelopment Forum?*			
					Vision 2020 Officer (EU-funded pilot support)?			
	PROFESSIONAL STAFF for EAL No:				8	2.5	1	
	STAFF STRENGTH/DISTRICT:				8	34.75	71.5	
FUNDING	^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^					BUDGETS UNDER DISTRICT MANAGEMENT		
AUDIT:	M I N E C O F I N					SOME IMPLEMENTATION SPOT CHECKS BY MINAG		
AUDIT TRAIL:	R I G O R O U S					W E A K		
	*Notes:	5 Provinces; 30 Districts; 416 Sectors; 2,129 Cells; Average parcel 0.35 ha						

Annex B13.2: Budget Earmarking in the Agriculture and ENR Sectors at District level

FIRST ALLOCATION 2011 – 2012 (MINECOFIN)

	MINAGRI						MINIRENA			AGGREGATION
	Program	**Intensification and Development of Sustainable Production Systems (Minagri)**			**Support to the Professionalisation of Producer's Capacity**	**TOTAL**	**Integrated Water Resources Management (Minirena)**	**Forestry Resources Management**	**TOTAL**	***MINIRENA WATER RESOURCES AND FORESTRY, PLUS:***
	Sub program/ District	**Sustainable Management of Natural Resources and Soil Conservation**	**Integrated System of Intensive Agricultural and Livestock Production**	**Irrigation Development**	**Promotion of Farmers' Organisations and Capacity Building of Producers**		**Rehabilitation of Degraded Watersheds and Promotional of rational use of water resources**	**Management of Forestry Resources**		***MINAGRI SUSTAINABLE NRM + SOIL CONSERVATION***
1	**Ngoma**	5,000,000	40,592,000	40,982,284	10,400,000	96,974,284	20,000,000	21,194,561	41,194,561	***46,194,561***
2	**Bugesera**	6,000,000	60,332,000	30,000,000	6,175,000	102,507,000	30,000,000	27,779,354	57,779,354	***63,779,354***
3	**Gatsibo**	5,000,000	61,808,068	30,466,851	9,240,157	106,515,076	-	28,193,205	28,193,205	***33,193,205***
4	**Kayonza**	15,000,000	48,700,690	30,500,000	7,012,447	101,213,137	-	325,051,352	325,051,352	***340,051,352***
5	**Kirehe**	15,000,000	50,000,000	-	11,276,815	76,276,815	20,000,000	24,026,102	44,026,102	***59,026,102***
6	**Nyagatare**	20,000,000	65,899,739	42,300,000	8,763,000	136,962,739	-	449,257,503	449,257,503	***469,257,503***
7	**Rwamagana**	16,000,000	40,607,846	30,000,000	6,830,818	93,438,664	-	21,222,238	21,222,238	***37,222,238***
8	**Huye**	51,000,000	58,000,000	-	5,300,032	114,300,032	50,750,000	22,444,854	73,194,854	***124,194,854***
9	**Nyamagabe**	60,000,000	42,000,000	-	8,617,398	110,617,398	-	26,867,201	26,867,201	***86,867,201***
10	**Gisagara**	5,000,000	50,000,000	-	8,457,004	63,457,004	-	23,586,708	23,586,708	***28,586,708***
11	**Muhanga**	52,770,001	62,327,932	-	6,460,000	121,557,933	60,000,000	21,566,940	81,566,940	***134,336,941***
12	**Kamonyi**	52,143,249	62,283,403	-	7,200,000	121,626,652	30,000,000	21,564,408	51,564,408	***103,707,657***
13	**Nyanza**	42,457,657	45,000,000	-	7,870,000	95,327,657	-	21,865,754	21,865,754	***64,323,411***
14	**Nyaruguru**	118,000,000	130,000,000	-	17,200,000	265,200,000	-	70,974,485	70,974,485	***188,974,485***
15	**Rusizi**	72,920,709	66,500,000	-	10,900,000	150,320,709	100,000,000	25,079,387	125,079,387	***198,000,096***
16	**Nyabihu**	60,721,851	47,494,000	-	7,000,000	115,215,851	-	21,164,562	21,164,562	***81,886,413***
17	**Rubavu**	55,500,000	51,000,000	-	5,158,826	111,658,826	-	20,261,273	20,261,273	***75,761,273***
18	**Karongi**	60,000,000	61,100,000	-	7,000,000	128,100,000	-	24,947,934	24,947,934	***84,947,934***
19	**Ngororero**	147,000,000	130,000,000	-	18,000,000	295,000,000	-	56,468,418	56,468,418	***203,468,418***
20	**Nyamasheke**	69,000,000	59,049,620	-	8,000,000	136,049,620	-	25,608,155	25,608,155	***94,608,155***
21	**Rutsiro**	55,000,000	50,000,000	-	11,686,019	116,686,019	-	25,131,641	25,131,641	***80,131,641***
22	**Burera**	74,000,000	61,487,571	-	10,462,500	145,950,071	-	24,853,526	24,853,526	***98,853,526***
23	**Gicumbi**	77,000,000	60,100,000	-	10,237,501	147,337,501	-	26,067,200	26,067,200	***103,067,200***
24	**Musanze**	65,000,000	48,249,616	-	11,393,452	124,643,068	20,000,000	23,210,292	43,210,292	***108,210,292***
25	**Rulindo**	56,000,000	41,000,000	-	7,000,000	104,000,000	35,000,000	21,916,463	56,916,463	***112,916,463***
26	**Gakenke**	70,000,000	58,500,000	-	12,500,000	141,000,000	-	24,639,554	24,639,554	***94,639,554***
27	**Ruhango**	50,000,000	52,000,000	-	11,710,767	113,710,767	-	20,944,412	20,944,412	***70,944,412***
28	**Nyarugenge**	15,200,000	29,000,000	-	8,180,000	52,380,000	-	14,530,805	14,530,805	***29,730,805***
29	**Kicukiro**	13,000,000	32,000,000	-	7,042,240	52,042,240	-	13,683,077	13,683,077	***26,683,077***
30	**Gasabo**	26,000,000	37,000,000	-	8,930,938	71,930,938	-	22,845,872	22,845,872	***48,845,872***
	TOTALS	1,429,713,467	1,702,032,485	204,249,135	276,004,914	3,612,000,001	365,750,000	1,496,947,236	1,862,697,236	***3,292,410,703***

Annex C14.1: Comparison of SEA Outputs with the SPTA2 Logical Framework: potential for enhanced planning of SPTA3

Most of the opportunities to enhance the environmental performance of the agriculture sector should find a place within the scope of SPTA3. The recommendations synthesised here refer only to those aspects that should be reflected in the SPTA3 document; to a large extent they provide a response to changes in policy thinking that have been taking place amongst stakeholders in the sector, but had not yet found an opportunity to be expressed in the relevant strategic and policy documents. In other cases they emphasise policy aspects and activities that were already present in SPTA2, but which have not been given the degree of attention we now believe they deserve due to their potential to contribute significantly to enhance the sector's environmental performance.

All recommendations are found in the sections dealing with the technical and systemic issues above in the main report. This section singles out those aspects that can be reflected directly in the SPTA3; they are presented as suggestions for modifications based on the SPTA2 logical framework, including observations where necessary – they are only indicative.

Only the SPTA2 log-frame sections on which changes are recommended are reflected.

The table below is divided into two broad sections. On the left are the key elements of the SPTA logical framework: activities and indicators. On the right are included proposed changes to the indicators, proposed activities and observations.

Indicator	Indicator in quantities / key activities	Proposed Indicator	Proposed Activities	Observations
Programme 1. Intensification and development of sustainable production systems				
Sub-programme 1.1 Soil and water conservation				
Reductions in the rate of soil erosion and restore fertility	Area protected against soil erosion increases from 40% to 100% of cultivable land	Use exact wording of the indicator that will shortly be revised on **'% of arable land under soil erosion protection'**.	Complement with promotion of less resource-intensive erosion control methods	
	Ha of existing terraces protected and rehabilitated (including protection of new terraces) rises from 13,000 to 45,000		Emphasis on awareness raising of farmers on benefits of soil erosion control and training of methods available	Lack of awareness of benefits is an obstacle to implementation
	Ha of newly constructed terraces rise from 13,000 to 32,000		Redefinition of indicator to measure proportion of arable land under soil erosion protection	To address also sustainability of structures (i.e. proper maintenance)
	Land protected by trenches and		Definition of methodology to	

	progressive terraces increases from 504,000 to 860,000 ha		measure new indicator, and piloting thereof	
Irrigation on hillside farms	70 new valley dams and reservoirs on hillsides, and water conveyance structures to irrigate 5,000 ha	**Water use efficiency** of irrigation schemes (Mm^3/ha/yr or Mm^3/tonne/year)	Agreement of indicator on water use efficiency for irrigation schemes ToR for all new irrigation schemes to seek water use efficiency as one of their objectives	Water use efficiency needs to be promoted in context of climate change adaptation and foreseen increased competition for water resources (different sectors). Indicator to be monitored by WUAs for each individual irrigation scheme.
Training of farm households in land husbandry on hillsides and hillside irrigation	35,000 farm HH trained Number of rural women trained		Training to focus on 'soil and water conservation' approach	This would include aspects of conservation agriculture and irrigation water use efficiency
Sub-programme 1.2 Integrated development and intensification of crops and livestock: crop diversification and intensification				
Increases in agroforestry and agro-silvopastoril activities	% of farm HH trained in seed technology, tree management and post harvest rises from 70 to 90 No. of tree nurseries rises from 1 per sector to 1 per Umudugudu 42 million trees planted annually	ha of farmland under agro-forestry Tree survival rate (consistency with NSCCLCD)	Institute **purpose-based agro-forestry**, which implies identifying needs in a participatory manner and selection of appropriate species, and awareness raising of benefits of agro-forestry Train extensionist workers and farmers on purpose-based agro-forestry	Indicator on 'ha of farmland under agro-forestry' to be harmonised with ENR SSP indicator, but a measure of degree of up-take of agro-forestry is needed Indicator on 'tree survival rate' is taken from the NSCCLCD
Review of fodder requirements for the One Cow Programme with recommendations for types of livestock to promote by farm size (fodder generating capacity)	Increase no. of farmers associations trained in improved animal husbandry practices from 200 to 300 p.a.			Integrate, where appropriate, fodder production from agro-forestry
% of livestock maintained in intensive systems	Increase in % livestock which is zero grazed from 6 to 70%			This objective remains very relevant to reduce pressure on land from livestock
Professionalised and increased honey production	12,888 honey farmers around Nyungwe forest, Akagera basin, Virunga mountain zone and			Use of pesticides in nearby fields may affect beekeeping activities.

	Gishwati forest professionalised in honey production (production, processing and marketing)			
Strengthen fisheries commodity chains	30 fish farming stations rehabilitated			Although not identified as a priority area, fish farming has to be promoted in compliance with environmental good practices, through EMPs
	Fish ponds increased from 4,000 to 8,000			
	Increase local fish production by 30% to 9,620 t p.a.			
Sub-programme 1.3 Marshland development				
Marshlands developed with irrigation and drainage systems and farmer training, after EIAs	Area of developed marshlands raised from 11,105 ha (2006) to 20,000 ha	Marshland agricultural developments that fully implement **EMP**s	Regular assessments of EMP compliance by MINAGRI	REMA will also have a major role in enforcing EMP compliance
Sub-programme 1.4 Irrigation development				
Establish the legal basis for water use rights and tenure rights for irrigation systems	Law and regulations for water use rights and tenure for irrigation systems			Not included in priority issues, but should promote water use efficiency
Develop hillside irrigation systems	Irrigated area on hillsides increases from 130 ha (2006) to 13,000 ha	**Water use efficiency** of irrigation schemes (Mm^3/ha/yr or Mm^3/tonne/year)	Agreement of indicator on water use efficiency for irrigation schemes ToR for all new irrigation schemes to seek water use efficiency as one of their objectives	Water use efficiency needs to be promoted in context of climate change adaptation and foreseen increased competition for water resources (different sectors). Indicator to be monitored by WUAs for each individual irrigation scheme.
Implement pilots for pressurised irrigation on hillsides and fertigation systems	500 ha of pilots with pressurised irrigation	Idem	Water use efficiency dimension is integrated and measured.	See above
Organise and train hillside farmers for water management, system maintenance and management of finances for irrigation systems			Farmers' awareness raising on water use efficiency	
Sub-programme 1.5 Supply and use of agricultural inputs: fertiliser and agrochemical supply and use				
% farms using inorganic	Increase in farms using inorganic	Change to:	Modify the indicator to measure	The indicator should be fully

fertilisers	fertilisers from 12% to 25%	'no. of farmers using fertilisers based after acidity correction and based on soil nutrient needs assessment for their particular land unit' (or similar)	use of fertilisers; develop methodology to measure it; and pilot its application	consistent to the one defined for the EDPRS, and should reflect the efficiency dimension
	Increase t fertiliser imported from 14,000 to 56,000 by 2012	Suggest to drop this indicator, as not consistent with principles of environmental sustainability and rationalisation of fertiliser use		
	Increase % of farmers organisations trained in fertilisers from 20 to 70%		Training to include optimisation of use based on soil nutrient needs assessment	
% farms using pesticides	Farms using pesticides up from 26% to 37%	Suggest to drop this indicator, as incompatible with principles of environmental sustainability and of rational use of pesticides Possible indicators: 'no. of farmers receiving training on P&D management' '% pesticides marketed with labelling in Kinyarwanda'		Indicators associated to safe use of pesticides must be integrated It must be ensured that, if use of pesticides is measured, the indicator should always be presented side-by-side the indicator on up-take of IPM
% farms practicing IPM	IPM policy developed, implemented		Develop IPM/Pest Risk Analysis (PRA) protocols, field scouting frequencies and roguing practices completed for all major crops Manuals developed for IPM/PRA and associated practices for all major crops	
	Farms practicing IPM up from 10% to 40%			
# fertiliser demonstration plots	12 on-going fertiliser demonstration plots established			
	Set up 12 FFSs		FFS training programmes incorporate modules and Kinyarwanda extension materials for: IPM/PRA and associated practices of all major crops; soil	

			& water conservation; acidity and nutrient management; crop & variety selection; crop-specific protocols for use of pesticides	
# on-going participatory analyses of soils and fertilisation	15 on-going participatory soil analysis exercises established		Undertake trials for acidity correction in all major land units Trials for nutrient management undertaken for staple crops in all major land units Prepare manual of economic soil acidity correction measures and nutrient management for all land units Incorporate elements of acidity correction and nutrient management in training for extensionists and farmers (through FFSs)	Acidity correction is important component for agricultural productivity, and has been largely neglected Based on nutrient needs assessment
	Expand the CIP to cover a larger % of arable land		Environmental compatibility of crops and varieties for defined land units determined on basis of experience and guidelines written Patterns of crop-weather interactions for defined land units and risk of meteorological variation and its crop effects determined on basis of experience and guidelines written Preparation of Kinyarwanda manuals for crop/variety environmental compatibility and meteorological risk for all defined land units Farmers trained on crop/variety selection, including consideration	CIP needs to integrate principles of ICM (including nutrient management) and flexibility for climate change adaptation Farmers are to be trained so they may make best of CIP and make informed choices on farming

			of climate variability/change, so as to make informed choices	
			Environmental screening of distributors, personnel, premises and handling in relation to agrochemicals	
			Review of agrochemical products manufacturers' instructions suitability for local conditions, and translation (Kinyarwanda)	
			Document results of previous work on efficacy and efficiency of P&D trials in CIP stable and other crops	Including associated residue analysis in products, soil and water
			Develop manuals for agrochemicals' safe dosages frequency, handling systems, disposal, economic application measures, equipping/protective clothing, pre-harvest intervals, risk	
			P&D certification of public and private extension staff	Including ToT of public and private extension staff; respective (pesticide use) certification
			Spot checking, detection and quantification of residues throughout the food chain	
Sub-programme 1.5 Supply and use of agricultural inputs: certified seeds and other inputs				
Increased use of improved seeds	% farms using improved seeds rising from 39% to 50%			In the SEA report MINIRENA is asked to emphasise protection of agro-biodiversity, which may be further endangered by increase in use of improved seeds
Increased use of farm mechanisation	% farmers association and cooperatives using mechanised techniques or animal traction		Farm mechanisation strategy to incorporate elements of conservation agriculture	This activity is not highlighted in the core text of the report, but poses an opportunity which
Increased use of animal traction				

	rising from 3% to 10%			already appears in the draft report for the mechanisation strategy
Sub-programme 1.6 Food security and vulnerability Management				
Early warning capability for food shortages	EWS established	% coverage of EWS (NSCCLCD indicator – to be integrated)	Fully develop EWS	Activity to be undertaken in coordination with Meteo Rwanda
		No. farmers under CIP with weather insurance coverage	Weather insurance to be promoted in all land under CIP Promoted beyond CIP as well	
Programme 3. Promotion of commodity chains and agribusiness development				
Sub-programme 3.2 Development of traditional exports: coffee				
Improved performance of coffee washing stations	Turn-around programmes implemented for 20 washing stations			Not identified as priority area, but MINAGRI should ensure washing stations treat wastewaters to standard
Sub-programme 3.5 Market-oriented rural infrastructure				
All-weather roads to priority production areas	1,000 km new all-weather rural roads	Possibility: km of RFR built up in compliance with environmental standards and climate proofing built into design	Ensure adequate environmental standards are adopted, including climate-proofing	See details of recommendations in Issue T5 of main report. Coordination with RTDA required
Programme 4. Institutional development				
Sub-programme 4.4 M&E systems and coordination of the agricultural sector				
Results indicators reviewed and refined as necessary and baseline developed where needed	Definitive set of indicators issued		Harmonise environment-agriculture indicators between all relevant government institutions	Close coordination with MINIRENA and RNRA
	Statistical baselines designed for indicators requiring them		Develop adequate methodologies for all harmonised indicators (environment-agriculture)	
	Baselines compiled			
Self-reporting monitoring system developed			Develop M&E framework and provisions (including methodologies) for SPTA3	

Annex D1: SEA Workshop

Agenda

Stakeholders Consultation Workshop
Thursday 8th December 2011

8:30	Registration	MINAGRI Administration
9:00	Welcome / Opening Remarks **SEA objectives and expectations of MINAGRI**	Dr Raphael Rurangwa, DG Planning, MINAGRI
09:20	The **Scoping Study**: - Prioritisation of systemic (S) issues: common threads of opinion - Prioritisation of technical (T) key issues - Quantitative data and trend analysis: potential environmental impacts from implementation of SPAT-2 (matrix) - Institutional actors (national – local matrix)	Mr John Pratt, Team Leader, SAFEGE
09:40	**SPAT-2 response to environmental concerns and the effectiveness of adopted Indicators (**table**)** (*comparing also REMA review 06/12/11*) *Question & Answers*	Dr Juan Palerm, SEA Expert, SAFEGE
10:00	**Further evolution of key issues** (S1 to S4; T1 to T5) **A. Framework of analysis, synthesis and presentation:** Statistical and Spatial data sources used (handout) Baselines and Projections SWOT: *Legal and regulatory; institutional; work in progress; knowledge base; human resources; population; etc* Required Results SMART Measures proposed **B. Group Work required:** Institutional arrangements; Means; Resources; Alternatives	Mr John Pratt
10:10	**SYSTEMIC (S) ISSUES FRAMEWORK** (handouts)**:** **S1. Monitoring and Evaluation Systems (Financial and Technical)**	Dr Juan Palerm
10:30	Tea & Coffee Break	
10:50	**S2. Climate Variability and Climate Change**	Dr Juan Palerm
11:10	**S3. Environmental Impact Assessments and Environmental Management Plans**	Dr Juan Palerm
11:30	**S4. Local Capacities**	Dr Alexis Gakuba, Local SEA Expert, SAFEGE
11:50	**TECHNICAL (T) ISSUES FRAMEWORK** (handouts)**:** **T1. Soil and Water Conservation**	Dr Alexis Gakuba
12:05	**T2. Soil Acidity and Nutrient Management**	Mr John Pratt
12:20	**T3. Crop and Variety Selection (CIP)**	Mr John Pratt
12:30	**T4. Pest and Disease Management**	Mr John Pratt

12:45	**T5. Rural Feeder Roads**	Dr Alexis Gakuba
13:00	**Summary Remarks** **Establishment of Work Groups** (S1 to S4; T1 to T5)	Dr Raphael Rurangwa
13:10	Lunch	
14:15	**Synthesis of Work Groups** with support of SAFEGE Team (see above)	
15:00	Tea & Coffee	
15:15	**Presentation of Summaries of Group Synthesis** *(8 minutes each)*	Dr Raphael Rurangwa & Work Group Chairs
16:30	**Response to presentations** Conclusions, recommendations and follow-up for SPAT-3	SAFEGE Team
16:50	Closing Remarks	Dr Raphael Rurangwa

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Plenary Discussions

Comments from the Consultant team:
NSCCLCD demands more care with survival of agro-forestry plantings.
Arable land under agro-forestry combination is MINIRENA Indicator.
Fertiliser and pesticide use indicators are not linked to performance.
'Marshland' nomenclature should be changed to (RAMSAR) 'wetland'.
A number of SPTA2 indicators lack baselines against which progress can be measured. Also, they are not monitored by ASWG.
General interest in water quality monitoring is lacking but RNRA is working on this: IWRMP design/ ToR.
Chains of reporting from Sector up to Presidency and MINALOC by-pass MINAGRI which has to take special steps to monitor implementation on the ground.
Projection: the soil erosion indicator needs to be reformulated: see SWOT table.

Clarification, Questions and Answers:

There is a regionally-oriented land husbandry project under MINEAC.
MINEAC is also participating in an EAC five-year Climate Change adaptation plan.

A) LWH, and B) RSSP: soil conservation and fertility improvement measures, including acidity correction by liming, + composting and use of inorganic fertilisers, have dramatically raised yields after just 18 months; Irish potato yields of LWH tripled.

Nitrogen in manure is about 1.8 kg available N/tonne; it requires 55 tonnes/ha for satisfactory N application; but compost has only 25% of that level of N and would need 200 tonnes/ha if based on N needs alone.

A robust, viable extension service is vital: see SPTA pillar 2; continuous extensionist refresher training is also needed.

This needs soft approaches (e.g. Contact Farmers/Cooperative self-help; IPM and FFS) as extension may be unaffordable in the long term.

There is a serious policy action gap: Accurate fertility/nutrient management has not been defined for specific land systems due to localized, slow pace on on-farm research. Actual productivity gains of CIP are not yet clear although this should be enshrined in EDPRS. Crop selection needs to be based on good intelligence. There are good soil maps to refer to.

Monitoring gives insufficient feedback to guide implementation. A clear framework for indicators development under SPTA 3 is needed. There is the risk that 8 institutions will apply 8 parameters to the same issue.…….

Water Quality: refer to WHO standards for a norm.

The team's assessment of local capacity gaps needs to be specific and targeted. This is not clear. It should be noted that many public sector workers are formally trained through MIFOTRA and its partners including RALGA.

Presentations of the Work Groups

S1 Monitoring and Evaluation

EIA's are important management tools for the benefit of the developer/operator and should be applied especially the EMP component with proper support from District administrations. Currently REMA is not receiving information from developers about progress of EIA-approved projects.

M&E indicators should motivate; agro-forestry is not well defined and its benefits are not well propagated. EIAs should include cost-benefit analysis/environmental accounting. REMA should analyse the global picture to derive aggregated impacts.

M&E needs integration across sectors and levels of administration. Agro-environmental indicators need harmonizing between MINAGRI-MINIRENA-REMA-MININFRA.

Idea and use of existing indicators that fit the NISR framework are sound for EDPRS purposes. Nevertheless NISR (or PMO) needs to be encouraged to create a significantly simplified monitoring and statistical framework. EDPRS2 planning should be grounded in proper data on performance under EDPRS but these are hard to find.

S4 Local Capacities

Vertical coordination needs to be clarified with clear roles and responsibilities; reporting structures need to be clear and streamlined.

Multiple mandates of staff at sector level need to be reduced.

Agreement is needed among MINALOC, MINAGRI, MININFRA, MINIRENA and MIFOTRA to address staff shortage at sector level, notably to ease the burden of the Agronomist.

ICT equipment and data management is needed by Sectors for effective performance and communication to District level.

Environmental Committees need to be reinvigorated and activated at District and Sector level as obligated under DDPs.

Indicators need to be generated to inform priorities. Data collection needs therefore to be carefully defined and be made compatible with future ICT data entry and analysis.

Self-assessment alone is not acceptable; objectivity requires external assessment!

RDB and REMA may be duplicating roles regarding EIAs; what are the enforcement capacities? An EIA stocktaking exercise is urgently required.

S2 Climate Change

CIP and the principles of Conservation Agriculture sometimes seem worlds apart.

Drought prone areas need special planning and management measures based on strategic risk assessment and financial analysis.

NSCCLCD demands sustainable use of fertilisers and other inputs; also integration of agroforestry.

Much CIP effort does not yet integrate social dimensions/farmer coping strategies for climate change. CIP needs social impact analysis as well as input and production analysis.

Native species of trees should be considered for their pest resistance vs exotic trees.

T1 Soil and Water Conservation

The group mostly worked on refining the draft Results framework (see Main Report)

New measures/indicators need to be devised for amount of land protected/not disturbed.

Water management needs to be optimized in the face of many demands on its use. Inflow and outflow monitoring structures are needed on all irrigation schemes.

Generally there needs to be a new focus on social organisation for soil conservation practices including forestry.

T3 Crop and Variety Selection

Baselines for selection can be too simplistic, e.g. lack of consideration of relative resistance of a variety to pest and disease attack under local conditions.

Safety in diversity should be a criterion. CIP may diminish genetic diversity.

RAB has the mandates to breed, test, select and demonstrate new varieties; some impressive successes achieved. But, it needs the extra step of participatory evaluation of new varieties. This will require extra resources for respective trials deployment.

T4 Pest and Disease Management

Some 5,000 farmers may already have been exposed to FFS training; more is needed.

Some farmers, e.g. highland potatoes, are spraying every week. Pesticide residues have not been monitored.

Monocropping may not be sustainable. Striga outbreak in maize illustrates the point.

Crop production needs to be founded on the Integrated Crop Management (ICM) approach. A critical mass of ICM extensionists needs to be ‘bred, including ‘Contact Farmers’.

Pesticide impact handling and use are a whole field requiring to be addressed within the scope of the new Agrochemicals Law. *For other technical proposals received and adopted see T4 Issue paper.*

Communiqué of Stakeholders Consultation Workshop Thursday 8th December 2011

A team from SAFEGE, Belgium was commissioned by MINAGRI and the EU to undertake the above assignment in two phases. The Scoping Phase was concluded in early November 2011 and defined the main SEA study; it was agreed the team would identify and focus on key issues related to the integration of environment in agriculture, and their interactions.

The global objective of the SEA is to ensure that environmental concerns are appropriately integrated in all sector (agriculture) and sub-sector (rural feeder roads) decision-making, implementation and monitoring processes. Findings of the SEA may influence policy development in the agriculture sector and the rural feeder roads sub-sector.

In particular the output will inform:

a) the Mid-Term Review (MTR) extension of EU Sector Budget Support (SBS) for Decentralised Agriculture (10th European Development Fund [EDF] 2009/021572);
b) the preparation of the 10th EDF (MTR) Sector Policy Support Programme (SPSP) for Rural Feeder Roads; and
c) the environmental and sustainability aspects of the planning processes in course for the preparation of:
    i. the upcoming third Strategic Plan for the Transformation of Agriculture (SPTA 3); and
    ii. the second national Economic Development and Poverty Reduction Strategy 2013 - 2017 (EDPRS 2).

The Workshop participants (40) included representatives from the Agriculture, Environment-and-Natural Resources, Energy/Water distribution and Transport Sectors at national and Provincial levels, from flagship land husbandry projects and from Local Government, academia, the EU and other international Development Partners; national and regional farmers' organisations and other interested Sectors were among the 85 invitees.

Following up on issues identified in the Scoping Phase, the consultant team presented for consideration the following refined list of key Technical (T) and Systemic (S) issues, their legal and regulatory context and an outline of their current baselines and their respective associated strengths weaknesses opportunities and threats (SWOT):

TECHNICAL (T) ISSUES

T1. Soil and Water Conservation
T2. Soil Acidity and Nutrient Management
T3. Crop and Variety Selection (CIP)
T4. Pest and Disease Management
T5. Rural Feeder Roads

SYSTEMIC (S) ISSUES

S1. Monitoring and Evaluation Systems (Financial and Technical)
S2. Climate Variability and Climate Change
S3. Environmental Impact Assessments and Environmental Management Plans
S4. Local Capacities

In the plenary session the issues were endorsed for further discussion by voluntary sub-division of the participants into four Work Groups, assisted by the team. With the exception of issue T5, the Work Groups explored the nature of the issues presented, re-examined the suggested SWOT and reviewed and modified a menu of suggested Results that could address each respective issue. Some suitable Measures were also devised and recorded, and examination of required Means was initiated.
The findings and recommendations of the Work Groups were presented to the general forum, resulting in further plenary discussion and consensus. The team offered the following six-point summary of the consensus that had been achieved and this was adopted:

I. All the issues presented are key issues and proposed for inclusion in the further synthesis and development of recommendations by the consultant.

II. Resolution of all the key issues will require cooperation and integrated approach between respective interested Ministries, their agencies and District Government and reference to the National Strategy for Climate Change and Low Carbon Development. MINAGRI and MINIRENA will be key partners in this process. Issue T4 will require inclusion of MINICOM and the Rwanda Bureau of Standards while issue T5 is essentially within the mandates of MININFRA and RTDA, in consultation with MINAGRI and MINICOM. In the important case of issues S1 and S4, cooperation and integration will need to be concerted among MINECOFIN, MINALOC, MINAGRI and MINIRENA.

III. For the purposes of objectivity and economy, key *technical and financial* monitoring Indicators for measurement of progress towards resolution of each issue will need to be agreed among the respective institutions and be unified to replace the current inefficient system of fragmented monitoring. These unified Indicators would be advocated for inclusion in EDPRS 3.

IV. The unified monitoring system under III. will need to be

a. accompanied by development of an extended and harmonised *technical-financial* Monitoring and Evaluation System for operational purposes of all levels of the Sectors, including *Imihigo,* and

b. supported by a commonly accessible integrated electronic/ICT *technical-financial* information platform extended through to Sector level, with MINECOFIN providing leadership.

V. Under issue S4, agriculture-and-livestock and environmental extension services (including land, water and forestry) require further strengthening as to technical know-how, operating resources and absolute staff numbers, especially at Sector level. Technical training, and associated expansion of the RAB Farmer Field Schools (FFS) programme, should embrace the principles of Integrated Crop Management (ICM) and Conservation Agriculture (CA). To free up extension resources, the scope for allocating Sector level infrastructure and land matters to a new post to be created for the purpose is advocated to MINECOFIN, MINALOC and MININFRA.

VI. Issue S3 is a burning issue under which the Environmental Management Plan (EMP) component of each Environmental Impact Assessment (EIA) needs to be actively enforced - under existing legal powers – with respective submission of reporting being incumbent on the 'operator', not REMA; the control system needs to focus on maintenance of environmental sustainability, not inspection for environmental failure.

It was agreed that the consultant team would incorporate a summary of the Proceedings in its draft Final Report and consider the other recommendations received on specific matters.
The output of the team will be considered during the design of SPTA 3, for which the Road Map to June 2012 is being developed by MINAGRI. SPAT 3 design will include consideration of cross-cutting issues including gender, youth and financial aspects and with the particular aim of satisfying Millennium Development Goal No. 1 to eradicate extreme poverty and hunger.

R. Rurangwa, PhD, Chairman
09/12/2011

Annex D2: SEA Work Plan

Expert inputs and timeframe

		Date	Calendar Day	KEY ACTIVITIES	TEAM LEADER	SECTOR EXPERT	Loc Exp		
				PHASE 1 (days):	22	24	20		
Oct	Sun	16	1	1.1 - Travel to Rwanda	1	1			
	Mon	17	2	Study key documentation	1	1	1		
	Tue	18	3	1.2 - Kick-off meeting at EU Delegation	1	1	1		
	Wed	19	4	1.3 - Review of key documents and preparation of stakeholder engagement strategy	1	1	1		
	Thu	20	5	Docs review; 1st Steering Comittee Meeting	1	1	1		
	Fri	21	6	1.4 - Key stakeholder consultations and review of material	1	1	1		
	Sat	22	7	Review documentation and generate meeting reports	1	1	1		
	Sun	23	8						
	Mon	24	9	1.4 - Key stakeholder consultations and review of material	1	1	1	FIELDWORK IN PROVINCES	
	Tue	25	10	as above	1	1	1		
	Wed	26	11	as above	1	1	1		
	Thu	27	12	as above	1	1	1		DAY #
	Fri	28	13	1.4 - Stakeholder consultations and field visits	1	1	1	EASTERN PROVINCE	1
	Sat	29	14	1.4 - Stakeholder consultations and field visits	1	1	1		2
	Sun	30	15						
	Mon	31	16	Prepare initial findings for Workshop 1	1	1	1		
Nov	Tue	1	17	Complete synthesis for Workshop 1	1	1	1		
	Wed	2	18	1.5 STAKEHOLDERS WORKSHOP 1: Determination of Key Issues and their Prioritisation	1	1	1		
	Thu	3	19	1.6 - Workshop Proceedings and (1.7) preparation of draft scoping report	1	1	1		
	Fri	4	20	as above	1	1	1		
	Sat	5	21	as above	1	1	1		
	Sun	6	22						
	Mon	7	23	as above	1	1	1		
	Tue	8	24	1.7Submission of draft Scoping Report and Annex of Scoping Workshop Proceedings; 2.2 Kigali Stakeholder meetings and preparations for SEA study	1	1	1		
	Wed	9	25	2.2 Kigali Stakeholder meetings and preparations for SEA study; Exp 2 Travel to Home Base	1	1	1		
	Thu	10	26	2.2 Kigali Stakeholder meetings and preparations for SEA study	1		1		
	Fri	11	27	2.2 Kigali Stakeholder meetings and preparations for SEA study	1		1		
	Sat	12	28	2.2 Kigali Stakeholder meetings and preparations for fieldwork	1		1		
	Sun	13	29						
	Mon	14	30	2.3 Kigali Stakeholders; Review documentation and generate meeting reports	1		1	Southern Province	
	Tue	15	31	2.3 - Stakeholder consultations and field visits	1		1		1
	Wed	16	32	2.3 - Stakeholder consultations: University	1		1	Univ	
	Thu	17	33	2.3 - Stakeholder consultations and field visits	1		1		2
	Fri	18	34	2.3 - Stakeholder consultations and field visits; Exp 2 edit scoping	1	1	1		3
	Sat	19	35	2.3 - Stakeholder consultations and field visits; Exp 2 edit scoping	1	1	1		4

	Sun	20	36						
	Mon	21	37	2.3 Kigali Stakeholders; Review documentation and generate meeting reports	1	1	1		
	Tue	22	38	2.1 Preliminary feedback from draft Scoping Report + Kick-off meeting with EU, MINAGRI and other key stakeholders	1		1	Western Province	
	Wed	23	39	2.3 - Stakeholder consultations and field visits	1		1		1
	Thu	24	40	2.3 - Stakeholder consultations and field visits	1		1		2
	Fri	25	41	2.3 - Stakeholder consultations and field visits	1		1		3
	Sat	26	42	2.3 - Stakeholder consultations and field visits	1	1	1		4
	Sun	27	43						
	Mon	28	44	2.3 Kigali Stakeholders; Review documentation and generate meeting reports	1		1	Northern Province	
	Tue	29	45	2.3 - Stakeholder consultations and field visits	1		1		1
	Wed	30	46	2.3 - Stakeholder consultations and field visits	1		1		2
Dec	Thu	1	47	' " "; Travel to Rwanda (expert 2)	1	1	1		3
	Fri	2	48	2.3 - Stakeholder consultations and field visits	1	1	1		4
	Sat	3	49	2.3 - Stakeholder consultations and field visits	1	1	1	Eastern P.	3
	Sun	4	50						
	Mon	5	51	Review documentation and generate meeting reports	1	1	1		
	Tue	6	52	2.4 Prepare findings for Workshop 2	1	1	1		
	Wed	7	53	2.4 Complete synthesis for Workshop 2	1	1	1		
	Thu	8	54	2.4 STAKEHOLDERS WORKSHOP 2: Issues and recommended Strategies/Means	1	1	1		
	Fri	9	55	2.4 - Workshop Proceedings and preparation of draft SEA report	1	1	1		
	Sat	10	56	2.4 - Workshop Proceedings and preparation of draft SEA report	1	1	1		
	Sun	11	57						
	Mon	12	58	2.4 - Workshop Proceedings and preparation of draft SEA report	1	1	1		
	Tue	13	59	2.4 - Workshop Proceedings and preparation of draft SEA report	1	1	1		
	Wed	14	60	2.5 - Preparation of draft SEA report	1	1	1		
	Thu	15	61	2.5 - Preparation of draft SEA report	1	1	1		
	Fri	16	62	2.5 - Preparation of draft SEA report	1	1			
	Sat	17	63	2.5 - Preparation of draft SEA report		1			
	Sun	18	64						
	Mon	19	65	2.5 - Preparation of draft SEA report	1	1			
	Tue	20	66	2.5 – Refine SEA report & Annexes	1	1			
	Wed	21	67	2.5 - Preparation and submission of draft SEA report	1	1			
	Thu	22	68	2.5 Debriefing meetings EU - MINAGRI - MINIRENA	1	1	1		
	Fri	23	69	2.6 - Travel to place of residence	1	1			
	Sat	24	70	SEA draft report feedback period					
	Sun	25	71						
	Mon	26	72	SEA draft report feedback period					
	Tue	27	73	SEA draft report feedback period					
	Wed	28	74	SEA draft report feedback period					
	Thu	29	75	SEA draft report feedback period					
	Fri	30	76	SEA draft report feedback period					
	Sat	31	77	SEA draft report feedback period					
	Sun	1	78						
	Mon	2	79	SEA draft report feedback period					
	Tue	3	80	SEA draft report feedback period					
	Wed	4	81	SEA draft report feedback period					
	Thu	5	82	SEA draft report feedback period					
	Fri	6	83	SEA draft report feedback period					
	Sat	7	84	SEA draft report feedback period					
Jan	Sun	8	85						
	Mon	9	86	SEA draft report feedback period					
	Tue	10	87	SEA draft report feedback period					
	Wed	11	88	2.7 Finalisation of SEA Study report					
	Thu	12	89	2.7 Finalisation of SEA Study report		1	1		

	Fri	**13**	90	**2.7 Finalisation of SEA Study report**		1			
	Sat	**14**	91	**2.7 Finalisation and Submission of SEA Study report**	1	1			
	Sun	**15**	92						
				Phase 2 (days):	**38**	**25**	**34**		
				Total (days)	**60**	**49**	**54**		

Annex D3: Team Itinerary and Meetings

Elapsed calendar days	Day	Date	Location	Activities performed
		Oct		
1	Sun	16	Kigali	1.1 - Travel to Rwanda
2	Mon	17	Kigali	Arrival Rwanda (TL); Study key documentation; team discussions
3	Tue	18	Kigali	Study key documentation; team discussions 16:00 Kick-off meeting at EU Delegation JP Notes on meeting
4	Wed	19	Kigali	Review of key documents and preparation of stakeholder engagement strategy; team synthesis of components of presentation paper to MINAGRI 11:30 EU Delegation administrative and technical follow-up; provision of literature e-folder
5	Thu	20	Kigali	Docs review; 10:30 MINAGRI Kick-off Meeting 14:00 consultation/planning session with MINAGRI Advisor to the Minister and REMA Professional I/C Environmental Mainstreaming AG Notes on MINAGRI Kick-off meeting; Administration
6	Fri	21	Kigali	Memorandum to Adviser on required stakeholder appointments. 08:00 IFAD Country Programme Officer JNP notes on IFAD. PS decision on Stakeholder Scoping Workshop. Planning of appointments. Consultation with MINAGRI DG Planning. Review of EUD, etc literature
7	Sat	22	Kigali	Review documentation and generate meeting reports. Plan Scoping Workshop.
8	Sun	23	Kigali	
9	Mon	24	Kigali	09:00 JICA; AG notes. 11:30 MINAGRI DG Planning & M&E Expert; Professional in charge of environmental mainstreaming; Decentralised Budget Planner; DG Inspection Services; Planning and Budget Officer; Strategic Adviser – Agriculture. JP Notes. 15:00 MINAGRI DG Planning & Subject Matter Specialists + BTC IPM TA. JNP notes. Meet Workshop candidate Facilitator; discuss Workshop content. Review of material
10	Tue	25	Kigali	10:00 ADB; JNP Notes on ADB 10:00 EU Feeder Roads SPSP/SBS Formulation Mission kick-off meeting with Steering Committee at MINAGRI; JP notes. 16:00 MINIRENA meeting; AG notes
11	Wed	26	Kigali	09:00 WB; JP notes. 13:00 USAID; JNP notes. 17:00 MINALOC; AG notes
12	Thu	27	Kigali	Development of meeting reports and documentation for Workshop. Recruitment of Workshop Facilitator.
13	Fri	28	Kirehe Town	Field visit programme to Kirehe District Council, KWAMP project and Muhama Sector Team.
14	Sat	29	Kigali	As above + visit unimproved/unassisted rural communities + witness Umuganda road maintenance and farm-forestry activities; return to Kigali

15	Sun	30	Kigali	
16	Mon	31	Kigali	Kirehe + KWAMP visit notes: AG. Muhama Sector visit Notes: AG +JP Team meeting: prioritisation of identified issues. Prepare initial findings for Workshop 1 and PowerPoint presentations
		Nov	Kigali	
17	Tue	1	Kigali	Complete PowerPoint presentations and synthesis for Workshop 1. Team preparatory meetings with Facilitator Anecto Kayitare + MINAGRI + Work Group Chairs
18	Wed	2	Kigali	1.5 STAKEHOLDERS WORKSHOP 1: Determination of Key Issues and their Prioritisation
19	Thu	3	Kigali	1.6 - Formatting of Workshop analysis and scoring summary; Develop Workshop Proceedings and (1.7) preparation of draft scoping report
20	Fri	4	Kigali	1.6 - Workshop Proceedings and (1.7) preparation of draft scoping report
21	Sat	5	Kigali	1.6 - Workshop Proceedings and (1.7) preparation of draft scoping report
22	Sun	6	Kigali	
23	Mon	7	Kigali	1.7 - Preparation of draft scoping report (also Sunday above). Memorandum to EUD re. fieldwork.
24	Tue	8	Kigali	1.7 Preparation of draft scoping report; Submission of draft Scoping Report and draft Proceedings to SAFEGE; 11:00 SIDA; AG notes 14:30 EUD re. future focus of field work. 2.2 Preparations for SEA study; Circulation of Workshop PowerPoint slides to MINAGRI. E-mail notification to RAB Zonal Coordinators of fieldwork programme and requirements
25	Wed	9	Kigali	Exp 2 Travel to Home Base; 2.2 Kigali Stakeholder meetings and preparations for SEA study; work planning discussion with EUD. 13:30 DUHAMIC; JP notes 16:30 RBS; JP notes
26	Thu	10	Kigali	2.2 Kigali Stakeholder meetings and preparations for SEA study. Fix future meeting with DFID. 15:45 Fieldwork/RAB planning meeting: Adv.to Minister + telcon RAB Coordinator/Southern. 16:00 Consultation (1) with MINAGRI M&E Cell
27	Fri	11	Kigali	2.1 Feedback from EUD draft Scoping Report for adjustment. 11:10 RALGA: AG notes 14:30 RTDA with Roads Form. Team Atkins; JP notes + memorandum as below
28	Sat	12	Kigali	2.2 Kigali Stakeholder meetings and preparations for SEA fieldwork. 10:00 CIDA; AG notes 15:00 Roads Form. Team Atkins + Engineering contractor: JP roads definition memorandum to DG Planning, MINAGRI JP memorandum to DG Planning re. RNRA data and mapping access Editing draft Scoping Report (also Sunday below)
29	Sun	13	Kigali	
30	Mon	14	Kigalii	2.2 Kigali Stakeholder meetings and preparations for SEA fieldwork. 10:00 KfW with Roads Form. Team Atkins; AG notes 11:20 DG Planning, MINAGRI re. RNRA data and mapping access 11:30 Consultation (2) with MINAGRI M&E Cell accompanied by

				Atkins. 14:00 Help Age (roads); JP notes 16:30 DG RNRA; AG notes
31	Tue	15	Huye	2.3 - Stakeholder consultations and field visits/Southern, accompanied by MINAGRI Environmental Mainstreaming Specialist (REMA): RAB Regional Coordinator – Southern; RAB agroforestry and soil conservation team. Overnight Huye
32	Wed	16	Huye	as above: National University of Rwanda: Dr N Nzeyimana, Soil Conservation Specialist; Dr Muhinga, Entomologist
33	Thu	17	Huye	as above: Kitabi District and Nyungwe Forest environs: Bean seed cooperative – forest interface
34	Fri	18	Kabgayi	as above: Ruhango District rice and pyrethrum farms/mill; Mwendo Sector; Gafunzo Cell; Buhando. Overnight Kabgayi
35	Sat	19	Kigali	as above: INGABO Farmers Syndicate, Muhanga. Return to Kigali; documentation
36	Sun	20	Kigali	
37	Mon	21	Kigali	Review documentation and generate meeting reports. Meeting RSSP and LWH Environmental Management Officers; Meeting Chair, MINAGRI Post Harvest Task Force/Chairman of Board: Rwanda Copoerative Agency, MINICOM
38	Tue	22	Kigali	Briefing DG Planning, MINAGRI; Meeting DG, RNRA; **DG Planning: kick-off meeting for SEA phase and feedback to draft Scoping Report at CICA**
39	Wed	23	Karongi	2.3 - Stakeholder consultations and field visits/Western, accompanied by MINAGRI Environmental Mainstreaming Specialist (REMA) and RAB Soil Conservation Officer: LWH Karongi; Irrigated rice community at Nyamasheke District. Overnight Karongi.
40	Thu	24	Musanze	as above: Ngororero District Vice-Mayor; Gatumba Sector Administration; Muhororo Sector Adm; Hindiro Sector Adm; Kabaya Sector Adm; Overnight Musanze.
41	Fri	25	Musanze	as above: Nyabiru District administration; Mukamira Sector; Bigogwe Sector; Gishwati Watershed Management project operations and watershed, Arusha; evening meeting Head of NRM RAB-N.
42	Sat	26	Kigali	as above: return to Kigali; documentation
43	Sun	27	Kigali	
44	Mon	28	Kigali	08:30: DFID Rural Livelihoods and Climate Change team; IMBARAGA Farmers' Syndicate HQ; documentation
45	Tue	29	Kigali	Reports editing; meeting F Goerieke (prev: German Agro Action); meeting EU RFR Formulation Team
46	Wed	30	Musanze	2.3 - Stakeholder consultations and field visits/Northern accompanied by MINAGRI Environmental Mainstreaming Specialist (REMA) and RAB Director NRM-N.: Rugezi Marsh; HelpAge Roads; Burera District Vice-mayor Finance and Planning; Cyeru Sector Adm; Butare Cell; Travel to Rwanda (expert 2). Overnight Musanze.
		Dec		
47	Thu	1	Musanze	2.3 - Stakeholder consultations and field visits/Northern: Gicumbi bench Terraces and CPPA Kisaro; Development of SEA Workshop documentation.
48	Fri	2	Kigali	as above: RAB – N. Regional Coordinator and Director NRM: detailed discussion of IPM and pesticide research and management strategies; return to Kigali
49	Sat	3	Kigali	2.3 - Stakeholder consultations and field visit/Eastern accompanied by MINAGRI Environmental Mainstreaming Specialist (REMA) and RAB NRM Speialist –E: Gatsibo Terraces;

				Nyagatare RSSP large scale rice development. Return to Kigali; documentation.
50	Sun	4	Kigali	
51	Mon	5	Kigali	Full team review and SEA output planning meeting; documentation and generate meeting reports
52	Tue	6	Kigali	2.4 Prepare findings for Workshop 2
53	Wed	7	Kigali	2.4 Complete synthesis for Workshop 2; brief DG Planning and team
54	Thu	8	Kigali	2.4 STAKEHOLDERS WORKSHOP 2: Issues and recommended Means
55	Fri	9	Kigali	2.4 - Workshop Proceedings and preparation of draft SEA report; meeting with EU Task manager
56	Sat	10	Kigali	2.4 - Workshop Proceedings and preparation of draft SEA report; consultation with RFR SPSP Formulation team.
57	Sun	11	Kigali	
58	Mon	12	Kigali	2.5 - Preparation of draft SEA report; post-workshop meeting with DG Planning and colleagues; TL attends RFR SPSP precursor presentation meeting/MININFRA + RTDA at EUD: TL notes of meeting circulated
59	Tue	13	Kigali	2.5 - Preparation of draft SEA report; AG attends RFR SPSP presentation meeting
60	Wed	14	Kigali	2.5 - Preparation of draft SEA report
61	Thu	15	Kigali	2.5 - Preparation of draft SEA report; Meeting EU Task Manager
62	Fri	16	Kigali	2.5 - Preparation of draft SEA report
63	Sat	17	Kigali	2.5 - Preparation of draft SEA report and Environmental mitigation brief to RFR SPSP Formulation Team and EUD
64	Sun	18	Kigali	
65	Mon	19	Kigali	2.5 - Preparation of draft SEA report
66	Tue	20	Kigali	2.5 - Preparation of draft SEA report
67	Wed	21	Kigali	2.5 - Preparation and submission of draft SEA report
68	Thu	22	Kigali	Debriefing meeting MINAGRI and key stakeholders
69	Fri	23	Home base	2.6 - Travel to place of residence
70	Sat	24		SEA draft report feedback period
71	Sun	25		
72	Mon	26		SEA draft report feedback period
73	Tue	27		SEA draft report feedback period
74	Wed	28		SEA draft report feedback period
75	Thu	29		SEA draft report feedback period
76	Fri	30		SEA draft report feedback period
77	Sat	31		SEA draft report feedback period
		Jan		
78	Sun	1		
79	Mon	2		SEA draft report feedback period
80	Tue	3		SEA draft report feedback period
81	Wed	4		SEA draft report feedback period
82	Thu	5		SEA draft report feedback period

83	Fri	6		SEA draft report feedback period
84	Sat	7		SEA draft report feedback period
85	Sun	8		
86	Mon	9		SEA draft report feedback period
87	Tue	10		SEA draft report feedback period
88	Wed	11		SEA draft report feedback period
89	Thu	12	Home base	2.7 Finalisation of SEA Study report AG;JNP
90	Fri	13	Home base	2.7 Finalisation of SEA Study report JNP
91	Sat	14	Home base	2.7 Finalisation; Submission of SEA Study report JNP; JP

Annex D4: List of Stakeholders Consulted

Bisangwa, Innocent	CIP Specialist	RAB	0788547748	PP: Alphonse Niyibeshaho niyibeshahoal@yahoo.fr
Bizimana, Jean de Dieu	M&E expert	MINIRENA	0788475482	bizimajean05@yahoo.fr
Busogoro, Dr Jean Pierre	Programme Director	BTC support to SPTA2	0788 720 277	jpbusogoro@yahoo.fr
Byakweli,Jean-Marie	Agriculture and Livelihood Advisor	DFID		J-Byakweli@dfid.gov.uk
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Carter, Matthew (MC)	Strategic Adviser - Agriculture	Rwanda Project Tony Blair Africa Governance Initiative	Mob: +250 788 309 902	matthew.carter@tb-agi.org
Cohen, David (DC)	Economic growth team leader	USAID	0788302931	dcohen@usaid.gov
Cramer, Dr. Gary (GC)	Senior agriculture advisor	USAID	0782496125	gcramer@usaid.gov
Cyamweshi,Rusanganwa	-	RAB - Western	0788 609 918	crkatana@yahoo.fr
Duraisaminathan, Dr. Visvanathan	Intl. Rural Roads Engineer	Atkins / COWI		V.Duraisaminathan@atkinsglobal.com
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Frantz, Brian (BF)	General development officer	USAID	0788386060	bfrantz@usaid.gov
Fumihico, Suzuki (SF)	Agriculture programme manager	JICA		suzuki.fumihiko@jica.go.jp
Furaha, Rw Pascal	Programme Officer	JICA		PascalFuraha.RW@jica.go.jp
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Gasana, Parfait	Crop Production Specialist	RAB		
Gatebuka Vedaste (VG)	Feeder roads	USAID		
Habamenshi, Didace	Environmental Officer	RSSP		didaceha@yahoo.fr

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Harerimana, Leonce	-	RAB	0784 866 410	Haleonce01@yahoo.fr
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Karambizi, Alphonse	Sector Executive Secretary	Muhama Sector, Kirehe		
Karanganwa Papias	Pp Ag. Deputy DG Lands and Mapping	MINIRENA		PP Jean Claude MUTABAZI mutjc@yahoo.fr
Katana, Cyamweshi	PP: Director Natural Resources Management (NRM)	RAB, Western Region	Mob: +250 788 562 938	rugavicky@yahoo.fr
Kayitare, Alexander	-	CICA/MINAGRI	0788 482 678	Illegible
Kayitare, Pierre Claver	M&E Officer	MINAGRI/PAIGELAC)		kayitarepc@yahoo.fr
King, Dr. Boen Tan (KT)	Team Leader - Economist/ COWI	COWI: Sector Budget Support: Rural Feeder Roads - Formulation Study	+31 623749304 Mob: +31 646661052	kingboentan@yahoo.com
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Mpagaritswenimana Védaste	Agronomist	Muhanga District	(250)078877 7570	vedaste007@yahoo.fr
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Mr 'Ohn'	Infrastructur	Parsons: USAID		

	e Planner	Rwanda Feeder Roads Improvement Program		
Mugabo, Patrick	Environmental Convention Specialist	Climate Change & Environmental International Obligations Dept REMA	(250)025258 0101 (Office), (250)788800 038 (Cell) Fax: (250)025258 0017	mugabopatrick@yahoo.fr
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Annex D5: Records of Stakeholder Participation

Bi-lateral Consultations with Stakeholders and other Meetings Attended

MINAGRI 20/10/2011

Briefing meeting with PS of MINAGRI at MINAGRI 20/10/2011 10:55 – 11:40

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PS welcomed the team of SAFEGE consortium and invited all the participants to a brief self introduction. After introduction of the participants, the PS talked about the importance of SEA as a key of sustainable agriculture. PS highlighted that the SEA would be welcome for the SPTA III. The recommendations of the SEA should be included in the SPTA III. Fortunately, the study coincides with the validation of Cabinet paper on the National Strategy for Climate Change and Low Carbon Development. So, the SEA shall be crucial on climate change issue. MINAGRI is ready to provide all support necessary for the proper completion of the study. A technical team will be established to work with consultants.

DZ: He reinforced the importance of the study for the EU as well as for the MINAGRI. The study should be practical and constructive.

JP: He presented briefly the aim of the study, the approach, process and methodology emphasising that the work would be largely at the strategic level. The methodology will be compatible with REMA and EU SEA guidelines. The aim of the SEA is to ensure that environmental concerns are appropriately

integrated in all sector (agriculture) and sub sector (rural feeder roads) decision–making, implementation and monitoring processes. Findings of the SEA may influence policy development in the agriculture sector and the rural feeder roads sub sector.

Concerning key date of workshops and outputs, JP suggested that the scoping workshop would take place on 3/11/2011 and the kick off meeting to mobilise the SEA study on 11/11/2011. SEA main workshop should take place on 9/12/2011. The draft SEA report should be ready on 21/12/2011.

JNP: His presentation was focused on the environmental potential key issues (10).

- soil erosion
- deforestation
- rural feeder roads
- expansion use of fertilizers and pesticides
- increased use of improved seeds
- protection of crop diversity
- promotion of an increase in industrial activities
- hillside irrigation
- reclamation of marshland for agriculture
- climate change

He explained that the team would examine whether current SPTA design and implementation responded to environmental challenges in the sector and would seek to familiarise with the general planning, and environmental considerations, being prepared in the design of SPTA III. A first approach would be to examine interactions of the sector (as demonstrated by the example diagram presented); climate change could make these negative.

Scoping will validate the matters relevant to the full SEA study and describe issues that are already being addressed and the adequacy of the measures perceived.

PS: The process is well, we have to support it. About consulting stakeholders, MINAGRI is ready to chair the meetings and to put on the technical meeting. He invited the consultants to provide own opinions, be forward-looking and offer constructive solutions and strategies and suggested to discuss the roadmap with a steering committee (SWG).

ASK: He reinforced the idea that SEA of agricultural sector is in the orientation of recent cabinet resolution on climate change.

VM: noted that the study will be useful for donors who have chosen sector budget support (SBS). It is also returned to the environmental issues related to the consolidation of land (use of chemical fertilizers, pesticides, post-harvest management ...) and the interactions between various sub agricultural projects.

PS: before closing the meeting, he reiterated that he is ready to facilitate the work (SEA study) and he wished that all agriculture sub sectors should be covered for better interactions between agriculture and environmental issues. He designated Annette Sylvie as a focal point of MINAGRI for SEA study.

IFAD 21/10/2011

Notes on meeting at IFAD 21/10/2011 08:00 – 10:15

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John Pratt (JP)				
Juan Palerm				

(JNP)				
Alexis Gakuba (AG)				

JP made an introduction on the objectives of the SEA and the purpose of the scoping phase. He requested AN to clarify his role and the role of IFAD in the agriculture sector in Rwanda.

IFAD is involved in the following projects:

- Kirehe Community-based Watershed Management Project (KWAMP), in the eastern Province, and which addresses issues of watershed management, marshland development, irrigation, forestation, and feeder roads.
- Support Project for the SPTA (PAPSTA). IFAD was the main donor supporting the preparation of SPTA2, as well as in supporting its implementation.
- Rural Small and Microenterprises Promotion Project – Phase II (PPPMER II)
- Smallholder Cash and Export Crops Development Project (PDCRE), which is due to be completed in March, 2012, although a follow-up project is being formulated.
- Umutara Community Resource and Infrastructure Development Project (PDRCIU), which closes December, 2011.

AN provided the SEA team an IFAD document that synthesises their interventions ('Enabling poor rural people to overcome poverty in Rwanda').

Environmental mainstreaming did not deserve much attention during the preparation of SPTA2, although the document includes a section at the end on cross-cutting issues. The main concern at that time was the increase in agricultural productivity.

KWAMP Project in Kirehe District (Eastern Province) is a very comprehensive project which addresses good environmental practices, including issues of reforestation and carbon sequestration. There is a German expert that supports KWAMP in reforestation aspects. Some of the hills being reforested had been deforested, but some were never forested.

In addressing reforestation, KWAMP has a MoU signed with the RNAB.

It was initially agreed that KWAMP would be a good project for the SEA team to visit.

AN agreed to send the SEA team the project's last Aide Memoire, which would give us a better idea of the project.

Decentralisation has been successful at an administrative level, but not so at a technical level, where large challenges remain.

Qualifies technical experts don't have incentives to go to remote areas (e.g. salaries are lower than for positions in Kigali, and living conditions are harsher).

Even if guidelines are provided to the local authorities, these are mainly involved in administrative matters. Technical expertise is very limited, and experts would normally have multiple functions to attend to, and tend to dedicate most of their time to administrative matters.

KWAMP project has been very successful, mainly because it is a donor project. Other areas were Districts deal only with budget coming from the central level, the situation is rather different. There is no pressure from MINAGRI nor from donors to see progress.

Districts have limited capacities in the use of resources.

In environmental matters, KWAMP works with a national environmental NGO: ALUPA.

KWAMP hires local service providers for environmental, and other, issues, and has drawn different MoUs with technical agencies.

The soil erosion protection indicator that is used at national level is very much questioned. It is ambiguous and the methods being used to apply it are not clear.

Although the indicator shows very significant progress, there is still much work to be done on soil erosion protection. It is very likely that the indicator statistics provides a much better picture than what the situation really is.

Unreliable statistics is a project in other sub-sectors as well (e.g. livestock census).

The technical (agriculture) staff at decentralised level are under MINILOC, and not under MINAGRI. This poses a problem for coordination.

At Province level staff recruitment has recently started. Before technical staff was only present at the central level. These staff at Province level will be RAB staff.

It is necessary to find a way to enforce the environmental expertise at the local level. Dedicated staff should be designated, and also these experts should be concerned only with their area of expertise.

The discussion turned to the figure of "rural development clusters", raised by AN. One particular cluster to highlight is the Joint Action Development Forum (JADF), which is multi-sectoral. Its mission is to map interventions at the District level.

SPAT3 would need to ensure support at the local government level. At the moment there are no administrative linkages between MINAGRI and technical staff at the local level. AN pointed out that, with the RAB (a very new agency), this issue is receiving some attention.

In terms of soil erosion, a monitoring framework is necessary, in order to ensure that benefits are maintained over time. At the moment no monitoring is carried out. A regular and feasible monitoring system is required.

Local government officers generate the statistics for soil erosion protection measures, and in many cases they don't have the technical capacities to do an adequate appraisal.

JP pointed out that there is potential for the use of EU funds at the local level.

In terms of fertiliser use, farmers are being encouraged to use synthetic fertilisers for the first time, and there is very little experience with synthetic fertilisers. There are exceptions, especially the cultivation of maize, beans and Irish potatoes in the north, where synthetic fertilisers have been used for some time.

JP pointed out that farmers with experience in use of synthetic fertilisers are unlikely to over-apply the product, whereas other farmers may be tempted to do so.

It seems that use of fertilisers may not be a key issue after all, although this have to be verified through consultations with other stakeholders.

With the crop diversification programme, the government has been providing subsidies covering 50% of the cost. However this has not been very successful (e.g. some farmers would re-sell the product at a profit, for example, in Burundi). The government seems to have decided to withdraw these subsidies.

AG pointed out that another important issue is storage, as often fertilisers, pesticides and seeds are stored in the same room.

Although fertilisers might not be a key issue after all, pesticides may prove to be confirmed as one. There are problems in the use of pesticides in the North and West, especially conflicts with beekeeping, as bees have died in contact with pesticides, honey quality gets affected, and there are impacts on pollination.

JNP pointed out that the indicators used, on amounts of fertilisers and pesticides used, could be risky, as it could encourage indiscriminate use just for the sake of meeting indicator targets.

The government is promoting some commodities. JP asked if this initiative is accompanied by environmental guidance (e.g. suitability of crops according to the type of soil and terrain). How much control does the government exert?

AN: environmental management is lacking, and there seem not to be environmental considerations integrated.

The Land Consolidation Decree is very recent (2010).

The main crops that are targeted for promotion are: maize, rice and beans. Other targeted crops include coffee and tea (in the south) and cassava (in the east).

Rice is promoted in marshlands only.

The designation of crops has taken into account environmental aspects.

Generally, rice farmers and potato farmers (in the north) are wealthy.

There is free trade within the East Africa Community, although tariffs apply for products imported from elsewhere.

AN will give the team contact details to organise a visit to KWAMP.

MINAGRI 21/10/2011

Notes on consultation DG PLANNING, MINAGRI 21/10/2011 20:00 - 21.15

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SCHEDULING OF TEAM APPOINTMENTS

A. SEA Scoping Workshop: RR welcomed the PS's decision to hold it on 02 November and agreed to discuss with AG the possibility of identifying a respected and effective potential (neutral) Key Facilitator for the Workshop. JP stressed this timing forced *all bilateral consultations for Scoping purposes to be concluded by Sunday 30 October.*

B. MINERENA, MINALOC, MININFRA and MINC&T, also MINEAC: RR kindly agreed to his office giving priority to fixing initial meetings for the team with the PSs/their representatives in these Ministries *according to the intent and requirements expressed in MINAGRI PS Ruzindaza's letter 1831/11.30 of 21/10/2011.*

C. RR kindly agreed to host an extra MINAGRI meeting with the team on Monday 24/10/2011 at 11:30 to introduce the team to the MINAGRI team responsible for design, implementation and monitoring of the SPTA phases 1 and 2, and officers concerned with planning for SPTA 3. He would provide TOR and other working papers related to SPTA 3 that may be available.

D. RR considered the Agricultural Research System, ISAR, under RAB required to be consulted (see phone book p 136) on soils and watershed management, related agro-forestry and other environmental matters. He decided that the team's meeting on Monday 24/10/2011 at 14:00 with his Subject Matter Specialists/Sector Leaders *(see A. Sylvie's subject matter and names list)* should be broadened to include DG's/their representatives for

Inspection; Crops; Livestock

Also representatives from RAB and the National Agricultural Export Board (NAEB).

It was agreed this meeting would include consideration of the (multiple loyalties) pressures under which Local Government Fields-persons currently worked and include examination of effectiveness of MINAGRI – Local Government technical communication and feedback at rural community level and its relevance to the SEA scope.*

E. Feeder Roads: RR explained there will be a Steering Committee meeting (MINAGRI + EU and others) on Tuesday 25/10/2011 (at 10:00?) and he urged team contact with Mr Jordi Cadilla-Falco, EU Attaché, Infrastructure to determine whether participation by a member of the team could be beneficial.

F. Agriculture Joint Sector Working Group (JSWG): There will be a monthly meeting (LAST THURSDAY OF THE MONTH, 3:00 – 5:00 AT MINAGRI) on 27/10/2011. Chair is PS; alternate DG Planning; World Bank provides Co-Chair. RR considered it could be beneficial for the team to provide a brief presentation at the meeting on the objectives and approach of the SEA Study. He would advise JP whether this was required.

G. RR encouraged the team to contact the Programme Manager of KWAMP for a field exposure visit covering a number of issues (receiving remedial measures) that had already come to the team's attention. This programme would include exposure to "unassisted" communities and their natural environment and would ideally be on 28 & 29 October. JP responded that this would be very welcome.

OTHER

H. RR explained that two key committees need to be taken into account in the team's preparations: The PM chairs the Integrated Development Programme (IDP) core committee of 5 Ministers: Finance; Local Government; Agriculture; Natural Resources; and, Commerce & Trade. This is the most senior committee focussing on Decentralisation. Much of the focus of effort on decentralisation has so far been in the area of administrative and fiscal management capacity.

I. * A broader Joint Delivery Committee (JDC) responsible for implementation of IDP is chaired by Minister of Local Government and includes all Ministers.

J. RR remarked that – as regards MINERENA and MINAGRI linkage - indicators for the National Environmental Strategy tended to be Generic and were not devised in consultation with MINAGRI, therefore there may be parallel MINAGRI (SPTA) environmental indicators and some duplication in formulation and monitoring which should be eliminated by harmonisation through inter-ministry and inter-agency dialogue.

K. RR considered statistics planning, capture and management in the agriculture sector were inadequate and did not provide a uniform or robust basis for inclusion of environmental statistics that could be required as part of SPTA 3 monitoring. Environmental statistics planning and management would need to come within the team's scope and include consideration of the related capacity of the National Statistical Institute; any improvements strategized could benefit other MINAGRI statistics management.

L. * EU agriculture sector budget support is utilised in the same operations to which implementation plans and indicators apply and the targeted utilisation pattern applied in SPTA 1 and 2 will continue in SPTA 3; under current programming, budget lines are precisely defined. EU monitors implementation and the targeted use of SPTA funds very closely.

M. * An ex-post assessment for MINAGRI administrative and financial control of resources, undertaken by Deloittes was sponsored by USAID, provided a positive assessment as to greater than 80% and this was based on, among other things, multi-level sample verification/inspection of local government's management and implementation in 5 assisted Districts.

N. GOR financial year is 01/07 to 30/06.

JICA 24/10/2011

Notes on consultation Suzuki Fumihiko, JICA 24/10/2011 90:00 - 10.10

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JP briefly talked about the objectives of the SEA study: the EU needs to be sure than environmental issues are integrated in SPAT3 and rural feeder road project. The purpose of the SEA consultants tam is to learn from JICA how marshland reclamation, watershed management are implemented.

SF: He said that he was informed about the mission from EU and briefly presented 4 main activities of JICA in Rwanda:

- Providing technical projects (e.g rice + horticulture coops project $5 mn from 2010 for 3 years)
- Providing money to farmers for getting fertilizers (2006: $1.3 mn; 2008: $3 mn; 2010 $2.3 mn)
- Planning how JICA can intervene in LWH support (parallel support; not basket contribution) with other donors (101 dams: feasibility assessment is taking a great amount of effort and time)
- Supporting the development of the national rice development strategy (NRDS)

SF: All JICA environmental guidelines are in principle those of GOR but essentially rely on the WB environmental management and monitoring framework. However JICA has provided its HQ EIA Guidelines for consideration in LWH.

Social dimension:

JICA is especially concerned to ensure that its dam development would not be accompanied by undesirable migration into the serviced zone

JICA looks to MINAGRI for leadership on integrating environment. WB is giving good guidance with its Environment Framework in LWH

JNP: PS wants the SEA study to provide guidance on this; EU especially wants to ensure avoidance of negative impacts of assistance.

District Government:

SF: DFID study of effectiveness highly recommended.

Local Governement reporting needs to be standardised.

LG constrained by lack of electricity and internet.

All Sector and District staff have performance contracts: scope of workload may be overambitious.

Absolute number of sector staff at LG level is too few:

SBS funds should be applied to support District level officers. First recruit project staff, with the strategy that they would (eventually) become absorbed into the LG system

For USAID, highly recommend consult Dr 'Gary' on LG matters.

For SIDA: Mr 'James' and Mr 'Bob' on Environment.

RAB (est. July 2011): Provincial branches under recruitment. Some 80 staff/Province

MINAGRI 24/10/2011

Notes on SPTA consultation DG PLANNING, MINAGRI 24/10/2011 11:15 - 12.15

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Beatrice	DG Inspection Services	MINAGRI		
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RR welcomed the participants, introduced his colleagues and requested JP to introduce the SAFEGE team and explain the purpose of the meeting.

JP: as part of the exercise to inform the planning of SPTA3 and Rural Feeder Roads environmental sustainability, and the respective environmental strategies and indicators that could accompany EU sector Budget Support, the team wished to familiarise with the ToR and other documentation that defined the approach and implementation of SPTA 1 and 2 and to be appraised of the current status/working papers/draft ToR for SPTA 3. Mr Carter kindly agreed to e-mail the ToR of the SPTA 2 design consultants (received 24/10/2011).

RR: drafting of SPTA 3 ToR will be based largely on SPTA 2 but incorporate changes matching lessons of experience and possibly reflect recommendations from the SEA Study. The new ToR will address concerns from all parties and especially build on the advice provided by the Joint Sector Working Group. Decentralised entities will contribute to the planning process.

District level workshops inputs in 2004 to the planning of SPTA 1 were fed into Prefecteur/Provincial validation workshops for further consolidation at national level. SPTA 2 was simply planned by inviting all stakeholders to contribute at national level.

SPTA 3 planning needs to build on the model of SPTA 1 where consultation (once again) needs to be tiered at the different administrative/political levels.

Documentation for planning *and implementation* needs to be made user friendly for each respective audience. Some former documentation was not adequately understood by all stakeholders. There should be translation into Kinyarwanda.

SPTA 3 design/issues will be fed into the next planning phase for EDPRS from 2012.

MINAGRI would endeavour to field a representative to accompany the SAFEGE team to key meetings with other bodies/organisations. The role of DFID was noted and the team responded that it was studying DFID documentation.

As provided in a previous meeting with the team, RR described the relevance of the Integrated Development Programme (IDP) core committee of 5 Ministers: Finance; Local Government; Agriculture; Natural Resources; and, Commerce & Trade; this is the most senior committee focussing on Decentralisation.

RR: SPTA 1 was 2005 – 08; SPTA 2 was 2009 – 12 but in 2010 the Government financial year was switched (by 6 months) to July – June. SPTA 3 will run to June 2013 and is intended to start operations during the current fiscal year, with some overlap to SPTA 2. MINECOFIN is the main body for programming the EU financial assistance and the team should keep in close touch with MINECOFIN (which had attended the team meeting with PS)

It was explained there would be a Scoping stakeholders workshop on 02/11/11.

MINAGRI No 2 24/10/2011

Notes on meeting with technical specialists at MINAGRI 24/10/2011 15:00 – 17:00

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John Pratt (JP)	Team Leader	Safege Consortium		
Juan Palerm (JNP)	SEA specialist	Safege Consortium		
Alexis Gakuba (AG)	Env specialist	Safege Consortium		

RR made an introduction to the SEA and introduced the technical specialists from MINAGRI present.

He stated MINAGRI's compromise to support the SEA team throughout the study.

This meeting was an opportunity to get ideas about the environmental issues associated to the agriculture sector.

JP provided more information on the purpose of the SEA and its calendar, clarifying the role of the scoping phase. He introduced the SEA team.

JP invited participants to expose what they feel are the environmental issues.

RT (DG livestock) mentioned that livestock is associated to issues of soil erosion, deforestation and climate change, amongst others. The links with livestock are not clear. Hypothetically, if livestock is kept in fragile ecosystems there might be environmental impacts if they are let with no control, and which may lead to increased soil erosion (hoofs).

Grazing behaviour of some animals could also lead to increased soil erosion. It is not known how much they contribute to degradation.

On the other hand, if livestock is kept in enclosures and pasture is planted, then this will have a positive effect on controlling soil erosion.

JP: Do guidelines exist for extensionists to use in rural communities= What is the baseline / starting point?

RT About 9-10 years ago there was open grazing in the Eastern Province. Government put up guidelines on zero-grazing for animal production. In 2008 under the land reform, land was demarcated and distributed; all land is supposed to be fenced. There is no more common land (now it is private enclosed land). This has had positive environmental implications.

Livestock also has links to climate change, in terms of emissions of GHGs.

JP: enclosures also have benefits in terms of animal health. This could be included in the scope of the SEA – issues of animal health and food safety.

JPB (BTC): Genetic erosion also needs to be taken into account. We want to increase production through increased intensification. This implies selection of varieties and leads to genetic erosion (loss of agro-biodiversity).

Another issue is the reasonable use of inputs: there are lots of residues. These impact on water resources. Future epidemics may increase.

How to get optimal productivity? We have to see how to reach optimal productivity whilst addressing environmental aspects.

JP: Farmers with experience would not over-apply fertilisers, but many farmers will use artificial fertilisers now for the first time.

We should address issues of pesticide use.

RT. When referring to "reasonable inputs", do we have that knowledge? Are there issues of capacity building involved?

JP: The effectiveness of communication down to the farmers could be an issue. The workshop will look at issues of institutional effectiveness and communication.

JPB: Agree that issues of fertilisers and pesticides should be separated. As for pesticides, more an more of them are being used. When a farmer faces a problem, his first reaction is "what can I apply?"

There has been some IPM experience from which we can learn. In the case of Irish potato, during rains the crop was prone to some pests and pesticides were applied. After being trained, to apply pesticides only when needed, the application of pesticides by farmers have reduced from 16 times per season down to 2-3 times per season.

There are thus issues of education.

JP: Asked if there have been economic studies done to show, e.g. the economic benefits of terracing?

RR: Yes, studies have been done. REMA can show us.

CIP began in 2007. There are two ways to evaluate: (a) all components, including inputs and capacity of country to use inputs; (b) sustainability aspects (can it be sustained?)

Indicators must also be developed.

JP: the economic studies that have been prepared could be used in the SEA.

CT: More and more land is to be irrigation, and dams need to be built. In some areas marshland will have to be partially drained, and also water drawn from lakes and rivers. These aspects can have an environmental impact. There are also issue of relocation of the population and impact on water budget.

JP: Raised the issue that with land consolidation particular crops are being promoted in particular lands. We want to understand what environmental requirements are being applied (apart from economic/productivity considerations).

RR: The Sector Working Group (SWG) is very open in its deliberations, and does not only focus on its successes, but also its challenges. We need to see if the initiatives can be sustained.

Under CIP there is a land consolidation dimension, but also mono-cropping.

JP: if would be useful to get an idea of environmental guidelines for land consolidation and choice of crops.

JNP: asked about the communication/coordination arrangements between MINERENA/REMA and MINAGRI. There are limitations from lack of baseline environmental information (e.g. on sensitive ecosystems).

RR: There is a high level of coordination. For example under the IDP (inter-ministerial level).

Large infrastructure projects all require an EIA accepted by REMA.

REMA was also involved in the preparation of this SEA's ToR.

Big projects, all need a green light from REMA.

JP: Mentioned that the EUD is interested in the functionality of the IDP.

JNP: we should ask REMA how cumulative impacts (e.g. of small dams) are being addressed.

CT: MINAGRI share information with REMA (e.g. on marshland developments). REMA can also undertake monitoring if they so desire.

RR: All the major projects include an environmental specialists.

JP: Loyalty of specialists?

RR: Specialists are hired by the projects. The EIAs are done by hired consultants.

BU: Another issue is the management of crop residues. They could have an impact.

JP: This is another example where the guidelines for crops will be useful to know.

RR: Requested JNP to provide MINAGRI team basic SEA guidance documents

JNP: Agree to send OECD DAC SEA Guidance as well as the EU Guidelines (context of development cooperation). (acknowledged received: 25/10/2011)

RR: Thanks everyone and reminded all of the workshop.

REMA 25/10/2011

Notes on meeting with REMA 25/10/2011 08:00 – 09:30

Name	Position	Organisation	Telephone	e-mail
Mr Denis Rugege (DR)	Environmental assessment adviser	REMA	0788382838	
John Pratt (JP)	Team Leader	Safege Consortium		
Juan Palerm (JNP)	SEA specialist	Safege Consortium		
Alexis Gakuba (AG)	Env specialist	Safege Consortium		

Introductions.

JP made introduction to the SEA objectives.

DR Advises on streamlining environmental assessment, also assists REMA in developing a framework for SEA. The SEA guidelines were based on the EU but simplified and adapted to the Rwanda context. The guidance is already operational. Also assists REMA in the review of EIAs.

This is one of the first SEAs being done in Rwanda. SEAs are mostly driven by donors, but in this case, although with EU support, the leading role is taken by MINAGRI. REMA is looking forward to this assessment.

JP Asks to clarify the role of Madeline as environmental mainstreaming person in MINAGRI.

DR It is REMA's wish these people (environmental mainstreaming) assume a role of sector authority staff, as is the case in MINAGRI.

DR There is a Department of Environmental Regulation and Pollution Control within REMA

JP The EU would like us to address issues of pollution detection and analysis

DR REMA was instrumental in elaborating the strategy of: "Resource Efficient and Cleaner Production in Rwanda"

This strategy identifies issues on agriculture (agriculture transformation programme). It was validated in August 2011. Stakeholders were consulted.

REMA has prioritised key issues in agriculture.

JNP Are the environmental indicators for agriculture 'owned' by MINAGRI?

DR This is an important issue. The Strategy is only a review. The next phase will be the implementation support. Questions of "ownership" will come in the next phase.

There is Joint Sector Planning. The SWAp should be an instrument to integrate those (environmental) aspects (into agriculture).

JNP Asks about environmental objectives, e.g. in the ENR SSP

DR EDPRS has ENR as cross cutting issue, but it is not clearly specified how it is to be achieved.

MINECOFIN would also normally check progress.

We don't know how effective is the ENR input into SWAps

REMA has leverage through the EIA system, as it gives out EIA Certificates (for projects).

SEA should have instruments in the same framework as EIA. We need SEA regulation, and then REMA will have leverage.

JNP Clarified the different role of SEA, e.g. normally no "SEA authorisation" by competent environmental authority for "approval" of a policy, plan or programme

JP SBS can attach conditions to disbursement

Discussion on indicators and role for the EU

JP Is there a list of "pollutants"?

DR There is a list of POPs

RBS has published a list for liquid waste (parameters)

JNP Who has the mandate to monitor water quality?

DR REMA for monitoring effluent discharges.

REMA has a mandate to produce state of the environment report bi-annually, but the data and analysis contained is of a very general nature. There are no detection and analytical capacities. It is still to be determined what needs to be measures.

There is a new REMA directorate for international environmental conventions and climate change.

There is no baseline data for nutrient load. This is something talked about, but there is no facility for water quality.

Wetlands have been categorised (document in French) by REMA. Some have been designated as Ramsar sites.

EIAs are done for projects that may affect wetlands. Construction works in wetlands is prohibited.

In some cases REMA is ignores, but this is not usual.

EIA Certificates are normally accompanied by monitoring requirements (in the form of an EMP). REMA carries out audits and inspections, but there is no regular monitoring carried out by industry (e.g. of effluent discharges).

REMA plans to encourage industry to volunteer data.

JNP Are there laboratories in Rwanda adequate for water quality analyses?

DR Not clear on capacities.

There is a new proposed regulation, RURA (Rwanda Utilities Regulation Authority) that would centralise inspection.

JNP: What are REMA's concerns about MINAGRI, if any? E.g. use of wetlands

DR Issues of application of products. Some constructions have taken place in wetlands.

JNP And cumulative impacts of dams=

DR It is a concern but there is no data. REMA's approach is through a research strategy (e.g. there might be issues of malaria, sediment load, etc.)

JNP EIA effectiveness?

DR EIA is very effective so far as leverages that have occurred. For example, bank loans would not be issued if the project is not accompanied by an EIA Certificate.

There is high political support for ENR

JNP Is there capacity to assess quality of EIA reports?

DR At the moment there are some problems in capacities, but REMA is working on it.

RDB has a unit dealing with EIA. RDB is a one-stop centre for the developer. EIAs initiate there and the RDB has the capacity to review EIAs and issue EIA Certificates. Only when there is a challenge, would it revert to REMA.

RDB reviews EIA technical quality. It is done by a REMA unit (deployed to RDB).

AfDB 25/10/2011

Notes on consultation with Joseph Nyirimana, AfDB, 25/10/2011 10:00 – 10.55

Nyirimana, Joseph (JN))	Agriculture specialist	AfDB	Mob: +250 788 304270	j.nyirimana@afdb.org
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JNP: He talked about the aim of the SEA and that we are in scooping phase, so we are looking for the environmental key issues. Next week, there were be a workshop on 2nd November: The end of the exercise is to get more performance in agriculture sector. AfDB is involved in agriculture. How it integrates environmental issues?

JN: he presented briefly 3 projects funded by AfDB:

- PADAB : marshland reclamation and watershed management (Bugesera district)
- PAIGELAC : fisheries
- PAIRD: marshland development and hillside irrigation

In all those project, the environment is a big issue.

JN said also that AfDB this year began SBS, so SEA was required, so a report has been written and showed us the hard copy and promised to send to us the soft copy. The SEA was conducted on "Livestock infrastructure support programme (LISP).

JNP: AfDB has a very sensitive projects, for example for small dams the potential impact is not important but cumulative could be significant.

JN: He said that it is true. PAIRB is in category I, and it's why an EIA was conducted and an EMP highlighted all adverse impacts and mitigation measures. However, a meeting with stakeholders in July 2011 observed that the environmental components are not taken seriously. So, in the recommendations of the meeting, the environmental audit was one of main points.

The question about monitoring of environmental aspects in decentralised entities of JNP, the answer was that capacity at district level is a big issue.

Before closing the short meeting, JN presented to us some documents of AfDB projects and promised to send to us soft copies of all.

EU SPSP/SBS of Feeder Roads €40 mn 25/10/2011

Informal Notes of Agriculture SEA team (EU/SAFEGE) on Steering Committee/kick-off meeting for EU funded Formulation Team of EU SPSP/SBS of Feeder Roads €40 mn 25/10/2011 10:15 – 12:10

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There were some 8 other participants including RTDA, mostly from public bodies, whose names will appear on the MINAGRI/COWI attendance list. AfDB, *MINALOC and MININFRA had sent their apologies for absence.*

A handout summarised the key features of the Programme

RR welcomed the participants and introductions were completed.

Deliberations/Minutes of the Agriculture Joint Sector Working Group and its SWAp discussions include coverage of rural feeder roads (RFR) and may be referred to.

JS: USAID-sponsored investigations related to post harvest needs identified huge potential benefits from restoration/ addition of all-weather gravel feeder roads, i.e. suitable for two-wheel drive pick-ups.

RR: The National Post-Harvest Staple Crop Strategy (PHSCS), a five-year policy framework, was adopted for use in March 2011 but formally awaits Cabinet approval in the coming weeks. It includes 7 strategic axes. Key development partners in implementation include WB, AfDB and USAID. Implementation is coordinated by MINAGRI and is targeting comparatively productive zones.

MINAGRI needs (to be assisted) to prepare an Inventory/Consolidation of existing and foreseen 'road commitments' of development partners.

Unit costs of road construction/rehabilitation are proportional to the grade of terrain. The Medium Term Economic Framework (MTEF) of the next 3 years needs to incorporate cost forecasts based on assessment of the foreseen costs according to the classification and budgeting for different categories of feeder road works contemplated.

Beyond roads, planning needs to integrate transport costs, the construction and sustainability of product bulking/consolidation/storage centres, analysis of operating costs, etc. Ministries leading respective components include MINALOC, MININFRA and *MINICOM which may lead the transport component.*

RTDA operates at District level and has a Roads Cooperatives support mechanism but there is a lack of engineering capacity at that level. There is one Infrastructure/Civil Engineer in each District; and 1 or 2 Agricultural 'Engineers'. There may be a need for extensive capacity building among all of the different District operating Divisions, i.e. planning; implementation; maintenance; monitoring and evaluation. Road Maintenance Cooperatives (in the recipient communities) of all 30 Districts will need capacity building *(including environmental awareness?)* and 'road kits'. There will be an annual Road Condition Survey; planning and implementation for sustainability will be vital.

Anticipated development partner commitments to RFR include:

EU $50 million (equivalent)

USAID $50 million

AfDB $30 million

Also, a new WB project is anticipated to start in 2012 – 13 for RFR rehabilitation, maintenance and related capacity building but it will be project support, not SBS. The identification mission will arrive in November 2011. Districts will be selected. Social and environmental impact assessment will first be conducted. WB is already active with the $45 mn RSSP in 11 Districts.

AR commended SBS approach of EU and other donors and said experience in this Third Phase of Decentralisation demonstrated that, with good controls, SBS offered the mechanism to accelerate effective implementation, capacity building and sustainability.

IY: A very big challenge is effective/timely systems for transfer of payments/reimbursements to and at District level for onward settlement of Contractors' bills.

KT: the formulation team arrived four days ago (21 Oct) and the COWI Engineer is expected to join the two Economists present as soon as possible. The Districts that would be targeted under EU €40 mn SPSP for Rural Feeder Roads (SPSPRFR) have yet to be determined. The team needs to meet some of the potential Contractors and consider the feasibility of intensive Labour-based methods proposed for a large portion of the rehabilitation works and for nearly all of the maintenance works.

The team also needs to familiarise with the national monitoring system for rural roads and notes there are no Baselines. There will need to be adoption of up to 5 Sector Performance Indicators (SPI) that are 'SMART'.

By Year 3 of SPSPRFR implementation, fixed SBS disbursements (100%) will reduce and be accompanied by variable/discretionary disbursements (possibly 40% rising to 50% by year 4) based on performance assessment.

The respective Verifiable Indicators of Achievement may include cross-cutting measures including degree of utilisation of labour-intensive methods; participation in and leadership by women (e.g. in road maintenance contracts); and environmental sustainability compliance measures based on guidance offered by the Agriculture Sector SEA study (in progress).

NP: The Road Law and national transport policy are silent on feeder roads but are being adapted to include them.

JCF: Government will define feeder roads; this definition is not vital for EU SBS programming purposes but will be required to be evident during implementation.

NP: MINAGRI's post-harvest strategy includes issues of access, rehabilitation and maintenance. The COWI team would:

a) consult the Rwanda Public Procurement Agency and

b) need to verify at District level the capacity for related roads project budget management

This would be conducted against the general Eligibility Conditions met by:

Sector Policy; Recent assessments testifying to Sound Public Financial Management; and IMF's RTB4 report for Stable macroeconomic environment

The SPSPRFR Formulation Team needs to be briefed on the MTEF for RFR (based on adopted policy). In this regard there will need to be adoption of a national Budget Line for RFR (under this SBS) with effect from 01/07/2012.

JP: The current Agriculture Sector Strategic Environmental Assessment (SEA) study began on 17/10/2011 and will be completed (draft: 21/12/2011) in late December 2011. Even if the full recommendations may not be ready before the Formulation Team of EU SPSPRFR has completed its mission, the SEA Scoping Study will have been adopted (mid-November) and hopefully main findings for inclusion in the full SEA study could be discussed. *There is a need for the two teams to compare their calendars of work*. A stakeholders SEA Scoping workshop will be hosted by MINAGRI on 02 November.

JCF: The Final Action Fiche for SPSPRFR will be submitted to EU Quality Support Group (oQSG) in December 2011 after formulation has been substantially completed

JH: Parsons/USAID are working in 12 Districts. The Contract for the programme is a USAID Fixed Amount Reimbursable Agreement The Parsons programme design team have been in Rwanda for a month.

Efforts to secure mapping of the respective road systems/Districts from National Land Centre continue; this delay in map access needs to be resolved.

TK: Benchmarks/Specifications/Standards for different categories of RFR need to be established and adopted by Government.

JH and Mr Ohn: there are numerous very well developed Standards from RSA, possibly SADDC (or EAC?), India and from the American Association of State Highway Officials and/or Texas Department of Transportation that could be adopted or adapted for Rwanda. RSA has 13 categories, as adopted by Swaziland. There is a financial cost of safety and environmental suitability (construction; maintenance) that has to be reconciled with budget capacity: TK's requirements would be met when a cost optimisation debate (including consideration of implementation and monitoring capacity) had been concluded for each category/standard.

RR: these considerations will need to integrate the current overriding policy in EDPRS to a reduce poverty by increased (sustainable) productivity.

KT: There will be a SPSPRFR Workshop. It may include discussion of standards and specifications.

MINIRENA 25/10/2011

Notes on consultation with DG Innocent Musabyimana, MINIRENA 25/10/2011 16:00 – 18.25

Name	Position	Organisation	Telephone	e-mail
Innocent Musabyimana (IM)	DG planning	MINIRENA	Mob: +250 0788 88492344	musasebin2000@yahoo.fr
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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JP introduced the team of consultants and gave briefly the aim of the SEA study. He said that the meeting with REMA was very useful. He also talked about the SEA scoping report workshop. MINIRENA is invited as a key stakeholder Ministry of MINAGRI.

JP asked a question about interactions between MINIRENA and MINAGRI.

IM: Before answering to the question, he presented ENR sector by power point.

Briefly, the main points were:

- MDGS
- Vision 2020
- Keys EDPRS priorities related to ENR

The presentation highlighted environmental key issues:

- Ensure sustainable use of marshlands
- Promote improved soil and water conservation practices
- Restore and improve soil fertility and prudence use of agricultural inputs.

Alternatives and mitigation measures are given.

Concerning implementation arrangements, IM said that there are : (i) MINIRENA which prepares and ensures follow up and evaluation of policies and startegies as well as environment protection; (ii) 2 agencies: REMA and RNRA which impement the policies elaborated by the Ministry.

In MINICOFIN, there is an Unit in charge of environment budget (focal point).

Answering the question on interactions between MINIRENA and MINAGRI, IM said that there is a coordination meeting at IDP level, SWGs and the focal point in MINECOFIN. The professionals in charge on mainstreaming of environmental is one of the solutions to the issue.

JNP: He asked the question about indicators of soil erosion control.

IM: there are indicators in the logical framework of EDPRS. But the indicators are more quantitative than qualitative. The EDPRS II will have to improve that aspect.

JP: Within ENR, the action plan for two SWGs (agriculture and environment) are different?

IM: the reality is that the SWG has to achieve certain objectives. For example MINIRENA has to make sure that there is interference in programmed actions.

There is for example a current joint action for rural feeder roads (MININFRA-MINALOC, MINIRENA). With a new organic law (2005), there are many regulations.

The big issue is now to harmonize national planning with decentralised planning, but an important effort is deployed.

Three pilot ministries in environmental mainstreaming are currently:

- MINAGRI
- MININFRA
- MINICOFIN

The guidelines of environment mainstreaming are available in MINECOFIN, and there are an agreement between MINIRENA and MINECOFIN.

Before closing the meeting, IM showed us the sector specific guidelines for environmental mainstreaming.

World Bank 26/10/2011

Consultation meeting with World Bank, Kigali 26/10/2011 09:00 – 10:20

Name	Position	Organisation	Telephone	e-mail
Valence Mwunvaneza (VM)	Rural development specialist - AFTAR	World Bank (WB)	Mob: +250 0788408339	vmwunvaneza@worldbank.org
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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

VM had attended the team's previous briefing with PS MINAGRI.

VM: This WB cell does not work in Environment. Since 2009 there is an accord (division of labour and support modalities) between GOR and donors that each donor will commit to not more than 3 sectors; but participation as a basket fund minority member is OK in a non-core sector. The Bank's sectors are

Agric; Energy; ICT aspects of Transport. It was in Health and Education. Currently it is a silent partner in Social protection.

In Rwanda WB provides General Budget Support (GBS; non-sectoral); Project Support and TA.

Projects are OK for non-SBS agencies such as USAID and IFAD but their execution is especially challenging. There have been recent efforts (Paris; Accra) for donors to harmonise their practices.

The Results framework for GBS is derived from the Common Performance Assessment Framework (CPAF) where there is a sub-set of three performance indicators for Agriculture out of some 40 CPAF Indicators. The CPAF Agriculture Indicators are:

Erosion control

Increased use of chemical fertilizers

Increased food availability

CPAF uses a colour-based system to reflect scores for achievement (screen demo).

Within EDPRS there are six Agriculture indicators. CPAF is a component of EDPRS.

Individual Sectors, e.g SPTA 2, each have some 60 indicators.

Budget reviews are carried out with donors against numerical Indicators accompanied by Policy Actions. Donor Co-Chairs of Sector Working Groups rotate. WB currently co-chairs Agric; SIDA co-chairs ENR.

SWGs are very good for raising issues; the Agric SWG may have an attendance of 100 each month (last Thurs at 3:00 – 5:00). The Agenda is circulated a week ahead. Every meeting allows AOB for "show and tell". NGOs in particular can express their issues.

Formerly Agric SWG was Rural SWG.

The host Minister may appoint Sub-Sector WGs with mandates of up to 6 months to address specific issues, e.g. has included Nutrition, fertilisers, Dairy industry, post harvest and storage. Each SSWG is charged with producing a strategy proposal. IFDC co-chaired the fertilisers SSWG.

A recently developed instrument is the Project Implementation Unit (PIU); maximum one for each Ministry encompassing all donor assistance. Agric is the exception. It still has 4 PIUs but formerly there were 20.

Joint Sector Reviews under SWG comprise:

March-April: forward-looking to the Budget for the next Financial Year from 01 July with a special view to setting new Indicators (as may be offered by our team);

Sept-Oct: backward looking.

New Policy Actions can be linked to an existing Indicator; i.e. it is difficult to get the Indicator changed but the Policy Action can (periodically) change.

However, there may be a possibility of getting an EDPRS Indicator adopted into CPAF.

JNP: How are indicators measured?

VM: CPAF will adopt a new Methodology and Baselines for 2012 – 2015: a good opportunity for integrating new recommendations such as from the SEA study. Our team may thereby influence SPTA 3 and EDPRS 3 which have not yet been drafted.

Agriculture has 6 indicators under EDPRS.

DFID is assisting MINAGRI on M&E; Alastair Sussock (ODI) deals with this full-time/custodian of M&E datasheet.

EU is assisting NISR with national statistical data capture

JNP remarked on the existence of the MINERENA-MINECOFIN Environmental Guidelines for Agric (also MINICOM and Energy)

VM: WB's two big Agric projects are RSSP and LWH. No project can be extended beyond three phases. RSSP is in phase 2 and closing 10 months early having spent all the budget successfully; Adaptable Progam Loan (APL). RSSP 3 is under formulation.

RSSP 1: roads and markets

RSSP 2: farmer organisations' professionalization; marsh rice

RSSP 3 (plan): marshland development + value addition/integration of value chains/processing/marketing. Coperatives support in marshlands AND hillsides.

GoR is very focussed in its requirements. Hence marshland development has given great results.

Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project

Works in 4 main sites

It has a micro-watershed/catchment based approach. Each command area may be some 700 ha (RSSP was 100 ha). A few are around 1,500 ha.

#1 intervention is erosion control – following slope categorisation

#2 is soil rehabilitation – typically 3-year program/site; includes lots of lime use

From JNP question: There are no payments for environmental services (too complicated). Excess water is collected at the bottom of the watershed; it is demonstrated that farmers higher up who may not get irrigation still reap huge gains from #1 and #2: the intervention can triple productivity (notably on semi-abandoned lands).

Full package is terracing, liming, composting, seeds and fertilisers, slope adjustment, waterways, bund grass stabilisation (e.g. Kikuyu), check dams. Investment cost of all these measures reaches around US$ 2,500 to 3,000/ha. Best impact seen in potato lands.

WB environmental requirements include:

Environmental and Social Monitoring framework – usually outsourced

EIA – usually outsourced

Project's own Environmental Management Plan (accompanied by appointment of full-time EM Officer)

TOR's for all of the above have to be approved by Bank's Environment division.

This all involves appraisal and approval by REMA which is rigorous.

Transparency: The Bank discloses all of this on its website and requires host Government to do the same.

WB six-month implementation support missions include Environment specialist. The bank is equally rigorous in the social dimension.

JNP: How is Bank's wider experience absorbed locally?

VM: Ministries' PIUs are not aligned to any donor. Government pays the PIU (i.e. project) salaries.

JNP: cumulative impacts, e.g. small dams…..?

VM: resettlement, malaria, bilharzia etc all get consideration for Before and After; ask EUD infrastructure cell for reports.

JP: challenges of implementation at local level?

VM: Forests are included for improvement in LWH and the project provides training to environmental officers of RNRA (NAFA arm). Most big forests are District Forests.

Buffer zones: minimum 10 metres around water bodies;

LWH = 50 metre biological barriers that may involve compensation payments to land owners

USAID 26/10/2011

Notes on meeting with USAID 26/10/2011 13:00 – 15:00

Name	Position	Organisation	Telephone	e-mail
Ms Aimée Mpambara (AM)	Rural development specialist	USAID	0788855075	ampambara@usaid.gov
Mr Gary Cramer (GC)	Senior agriculture advisor	USAID	0782496125	gcramer@usaid.gov
Mr Brian Frantz (BF)	General development officer	USAID	0788386060	bfrantz@usaid.gov
Mr Vedaste Gatebuka (VG)	Feeder roads	USAID		
Mr David Cohen (DC)	Economic growth team leader	USAID	0788302931	dcohen@usaid.gov
John Pratt (JP)	Team Leader	Safege Consortium		
Juan Palerm (JNP)	SEA specialist	Safege Consortium		
Alexis Gakuba (AG)	Env specialist	Safege Consortium		

Introductions

JP: Presentation of SEA and its objectives

USAID staff pointed out that in the day of the workshop (02/11) there is a development partners' meeting on ENR, so most of the environmental people from donors will be in that meeting. USAID will try to see if it is possible to move the meeting.

JP Description of workshop objectives

AM The environmental authorities raise concerns about the use of fertilisers to increase productivity, but this is not a fair criticism. Soils are degraded. The targets set are minimal, as figures show.

A Law on Agrochemicals is being discussed in Parliament. Fertilisers and pesticides are treated together (same box)

Soil erosion is a problem. However in 5 years Rwanda has become "greener". MINAGRI has worked on this issue. Although the target of stopping erosion in 10 years is utopic, there is progress.

There is a major gap: technical capacity. Is there capacity to implement what is on paper? E.g. MINAGRI, MINIRENA, MINILOC, REMA?

DC There is little discussion on natural soil fertility rehabilitation through a change in agricultural practices, e.g. low tillage, replacing organic matter. There is only talk about fertilisers and planting grasses. Will this aspect be discussed? There would be an opportunity lost if not discussed.

JP Because of the SEA timing there is an opportunity to consider these aspects.

We will be giving recommendations for SPTA3 as well as on performance indicators. Some of these measures can be encouraged for farmers to do on their own.

BF Much of government effort is on inorganic fertilisers

JP Opportunity now to ensure "sustainable production". It would probably need more involvement of the environmental institutions

AM MINIRENA and REMA focus on soil erosion control: they only criticise fertilisers. Their focus is mostly on pollution control The mindset that confuses "environment" and "cleanliness" does not help. E.g. staff need more exposure to e.g. farming systems.

GC Capacity building is key. One first step: take samples in order to find out if there a problem? If so, where does it come from? The "problem" might have other drivers, e.g. mining rather than agriculture. Agricultural inputs are very small.

JNP Currently there is no baseline for e.g. water quality, so it is difficult to determine the drivers of pollution, or the contribution of agriculture.

VG ENR people are supportive of agriculture, especially REMA. REMA has concern over use of fertilisers in marshlands. There are no discussions on how to manage marshlands. There are different views, e.g. REMA would only like to see organic fertilisers, whereas MINAGRI prioritises inorganic fertilisers.

JP Could bring ENR staff to other countries to see how environmental practices in agriculture are managed (study tours)

In the main SEA study we will look more into inter-institutional coordination aspects.

GC There are issues of trade-offs, cost-benefit analysis.

If he were to prioritise, marshlands would be up in the list.

BF The LWH EIA is an important background document. It also addresses issues of inter-ministerial coordination.

The Rwanda Development Board (RDB) also addresses environmental aspects. They target for investment and also check for environmental compliance.

RDB has an environmental mainstreaming officer from REMA deployed. RDB also have environmental performance targets.

In the use of natural resources, different ministries have conflicting interests. A clear example is with water. MINAGRI wants water for irrigation, whereas the Water Authority is concerned with water consumption issues. At the same time there is no understanding as to what is the water balance. There are issues related to not checking consistency of different authorities making different plans for different users over the same resources.

Mono-cropping is also an issue. What is the impact of continued mono-cropping on soil productivity? The decision of what to grow where may have taken into consideration environmental factors.

AG There are good practices with mixing crops, e.g. maize and beans.

GC Phosphorous put into the ground is tightly fixed, so unlikely to be source of eutrophication.

Inter-cropping is a good idea.

DC Could be considered for SPAT3

GC Good farming (agricultural) practices could only show effects on the longer-term (e.g. 10 years), so this may put of MINAGRI from promoting such practices. The issue now is on production.

DC There are good environmental practices that can be done concurrently with e.g. using fertilisers, so productivity does not drop.

BF If we propose things that will impact production, even on the short-term, then MINAGRI will put them aside.

AM Traditional agriculture is been put aside and substituted by mono-cropping.

GC Traditional farming is not compatible with land consolidation, which has commercial purposes.

High cash value crops will be grown on the marshlands, which will require plenty of fertilisers.

AG Some have a bad idea on mixed farming. Environmentally it is a very good practice. It is an indigenous practice. Eg. Sorghum is very much link to the culture for the population, and necessary for biodiversity (some bird rely on it). Mono-culture could improve productivity on the short and medium term, but may lead to negative effects in the long-term. For example, affectation on birds and bees, which are necessary for pollination.

JP Marshlands seem to be top of the list. We are dealing with degraded traditional farmland. Marshland are new developments. Productivity would be much higher than on hillside farming.

It's possible to attach rigorous environmental guidelines to marshland developments. It would not interfere with productivity gains.

In case of marshland development, the SEA could come up with strategic advice.

VG There are 60,000 ha of marshland; under EDPRS foreseen to develop 40,000 ha; at the moment MINAGRI has developed 11,000 ha.

How much will feeder roads be covered by the SEA?

JP Feeder roads programme is driven by agricultural needs. We will look at it from an agriculture point of view. MINAGRI will be the main ministry responsible for implementation of this programme.

BF USAID has an interest in feeder goads. Concern: are government environmental compliance standards for feeder roads "good"? and: to what extent are they being implemented?

JP Briefed on feeder roads meeting (EU). There are no standards and no definition of a "feeder road". There are various standards in Africa for different types of roads, including environmental standards. There is plenty of information and international experience on this.

We will not try to establish the standard. The USAID team will be pioneering that.

Our concern: is there capacity to implement and monitor environmental standards by the relevant authorities?

BF It is hard to assess capacity to implement standards that are not yet defined.

JP Our team will be looking at findings from the USAID team

BF USAID has focus/intent in building capacity, especially at local and district level.

JP We will be looking at implementation and M&E capacities.

BF Local level capacity assessment is being done for different areas

JP ENR and agriculture at local level…are they the same person?

GC At District level MINALOC employees, and no direct reporting to MINAGRI

District Environmental Officers are MINALOC employees (not REMA)

GC If high priority is marshland, the focus should really be on land consolidation.

MINALOC 26/10/2011

Notes on consultation with PS Cyrille Turatsinze, MINALOC 26/10/2011 17:00 – 18.30

Name	Position	Organisation	Telephone	e-mail
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Egide Rugamba (ER))	DG planning	MINALOC		rugamba2002rw@yahoo.com
William	Rural settlement	MINALOC		ngabowilly@yahoo.fr

Ngabonziza (WN)	task force member			
Gakuba, Dr Alexis (AG)	Local Expert	SAFEGE Consortium	Mob: +250 788 540 725	agakuba@hotmail.com
Palerm, Dr Juan (JNP)	Sector Expert	SAFEGE Consortium	Mob: +250 786 243 378	jn.palerm@gmail.com
Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JS welcomed the team of consultants and said that he was pleased to discuss with him because MINALOC is involved in agriculture at decentralized level and he is involved in rural feeder roads.

JP briefed about the mission and invited AG to talk about the field trip in Kirehe District at the end of the week. AG said that the first field visit will start in Kirehe District, where the team shall meet with District officers, visit KWAMP project and local authorities.

JP: talked about the agenda of the mission and after the first question to PS was: "How your partnership with MINAGRI and MINALOC is?"

PS: He answered that there is a number of *concertations* under EDPRS, MINALOC participates in SWGs and IDP is a forum which they increase harmonisation of policies (at central government level. The ministry gives guidelines and the implementation is at District level. *District Development Plans are written for a period of 5 years. Typically the Mayor of the District commits the citizenry. There are local/micro level performance contracts; these are monitored/evaluated on Accountability Days and (if satisfactory) signed off. There are many non-monetary output indicators, e.g. school attendance (after awareness raising) and increases in school enrolment. These performance commitments stretch right along the administrative hierarchy from Village up to District.*

ER: The staff members at District level are the representatives of technical ministries and not of MINALOC. It's why reports written are sent to technical ministries and MINALOC. IDP (integrated development program is a framework which avoids duplication.

At local government level, performance contracts gives an orientation of sector policies and harmonises priorities. For example in Crop intensification production or land consolidation, each ministry is involved (MININFRA for feeder roads or meteorology stations, MINIRENA for environment and land aspects, MINICOM for market...). *In this way land utilisation and productivity are optimised. SACCOs are an associated initiative.*

PS: In clear terms, there are interactions. There are commitment. between EDPRS (Central level) and DDP (District level) through IMIHIGO. He emphasized that IMIHIGO begin at households level and go to country level. Citizens have responsibility to protect their soil against the erosion.

JP: asked the question on land law

ER: the land law is an organic law, there many decrees which show how the soil could be managed for sustainable development. The environmental committee at District level have to handle for example problems of soil protection.

WN: he highlighted the importance of feeder roads in awareness for living in new villages (Imidugudu). Feeder roads are incentive measure for *people to live their public commitment in Imidugudu.* Organizing resettlement requires feeder roads because movement is easy.

PS : he talked about the linkage between imidugudu and land consolidation. Our government cannot consolidate lands without resettlement. Consolidation of lands requires environmental management like soil protection, agroforestry, .. *It is the subject of a Land Use master plan (at which level?). A really good example of a settlement village is Kayonza. Consolidation nationally is considered 62% complete. The average family farm is not more than 0.7 ha in extent.*

There is a long term target for 30% of the population to be in organised cities, i.e. managed migration (with youth off-farm vocational training) from the land.

JP: He thanked PS for the useful information given.

KWAMP, Kirehe District 28/10/2011

Notes on consultation with KWAMP officers, Kirehe District, 28/10/2011 11:40 – 13.00

Name	Position	Organisation	Telephone	e-mail
Ananie Mwiseneza (AM)	Director of Administration	Kirehe Ditsrict	Mob: +250 0785625627	mwisan2020@yahoo.fr
Joseph Nsabimana (JN)	Water management officer	KWAMP	Mob: +250 078 8601314	njosephkan@gmail.com
Veredane Twizerimana (VT)	Natural resources officer	KWAMP	Mob: +250 078 8449514	tverediane@yahoo.fr
Madeleine Usabyimbabazi (MU)	Professional in charge of environmental mainstreaming	MINAGRI	Mob: +250 0788 8879101	madousa2020@yahoo.fr
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Palerm, Dr Juan (JNP)	Sector Expert	SAFEGE Consortium	Mob: +250 786 243 378	jn.palerm@gmail.com
Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

MU: talked briefly about the mission in Kirehe District: visiting KWAMP project.

JP: He introduced the team of consultants, he said that there are a number oriented on environmental protection. It is why the team chose to visit KWAMP. In November 2011, the team will have an opportunity to visit other projects and other areas of the country. He asked the linkage between MINAGRI, performance assessments and District level agriculture extension.

JN: KWAMP is in Kirehe DDP, and KWAMP covers many aspects: natural resources, water management, environmental protection, ...At district level, technical staff works closely with KWAMP staff, especially agronomist, infrastructure officer and environment officer.

JP: he asked the sector structure.

AM: agronomist at sector level coordinates many sub sectors (agriculture, livestock, environment ,infrastructure, cooperatives...

JNP: How District measures performance?

AM: At the beginning of the year, district prepares an action plan and performance contract signed between the mayor and executive secretaries of sectors (12).

MU: she highlighted that MINAGRI makes earmarked transfer to districts for a specified activities.

JP. is there IMIHIGO at sector level?

AM: Yes, there is.

JP: he questioned about performance contract indicators.

JN: the sector determines areas to protect and KWAMP gives support (technical and financial)-

JP: Any indicators of soil sustainability, in maintaining forests, soils...?

AM: Environmental committee exists at sector level, and one its role is monitoring. A quarterly report is submitted.

JP: Is there is an emergency fund in District?

AM: there is a reserved budget for environment, but in some cases it can not resolve all problems.

JNP: Which are challenges and opportunity?

AM: The main challenges are: soil erosion and a big number of hills non afforested. This year the district invited private sector to afforest hills in collaboration with communities. These measures will facilitate maintenance.

JH: he suggested that the afforestation of hills should be agroforestry oriented.

VT: she highlighted that there is an action plan for 5 years.

After the meeting with KWAMP and district officers, the team visited marshland reclamation, watershed management, feeder roads construction (Nyamugari and Mahama sectors) and had a very interesting meeting with sector officers in MAHAMA sector.

The team of consultants met with:

- Ndakasha Siméon: legal officer, tel 0788806775
- Nsengiyumva Jean Damascène, agronomist, tel 0788480080
- Karambizi Alphonse, executive secretary.

Mahama Sector Executive, Kirehe District 28/10/2011

Notes on Mahama Sector Executive consultation, Kirehe District 28/10/2011 16:15 - 17.45

Name	Position	Organisation	Telephone	e-mail
Nsabimana, Joseph (JN)	Water management officer	Kirehe Community-based Watershed Management Project (KWAMP)	Mob: +250 78 8 601 314	njosephkan@gmail.com
Veredane Twizerimana (VT)	Natural resources officer	KWAMP	Mob: +250 788 449 514	tverediane@yahoo.fr
Ndakasha, Siméon (SN)	Sector Legal Officer/Deputy Exec Sec		Mob: +250 788 806 775	
Karambizi, Alphonse (for last 30 minutes of meeting)	Sector Executive Secretary			
Nsengiyumva, Jean Damascène (JDN)	Sector Agronomist		Mob: +250 788 480 080	
Usabyembabazi, Madeleine (MU)	Professional in charge of environmental mainstreaming	MINAGRI	Mob: +250 788 879 101	madousa2020@yahoo.fr
Gakuba, Dr Alexis (AG)	Local Expert	SAFEGE Consortium	Mob: +250 788 540 725	agakuba@hotmail.com
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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JN previously explained that Mahama is one of 18 identified watersheds/catchments targeted for assistance, including farm consolidation, by KWAMP; mechanised road rehabilitation/widening by Contractor 'Horizon' was passed at Nyamuguli village en route to the Mahama Sector offices. The District Director of Infrastructure would be in a position to provide the road specifications for this contract.

SN welcomed the participants, introduced his colleagues and requested JP to introduce the SAFEGE team and explain the purpose of the meeting.

JP explained the scope of work and that, after a very useful introductory meeting at District headquarters, this was the team's first opportunity to learn how agriculture and environment are managed and supported at Sector level.

JP: how is the Sector Executive organised/organogram?

A: The Sector employs the following technical officers:

Executive Secretary; he reports to the District Mayor by phone and written paper letters

Legal Officer

Agronomist*

Vision 2020 Officer (EU-funded pilot support)

Social Affairs Officer; deals with Education (adult and child literacy respectively) and Health

Accountant

*There is also a directly appointed RAB Sector Livestock/ Veterinary Assistant.

The Performance Contracts set for the Agronomist and the Livestock Assistant (and other officers) are developed on the basis of consultations and agreement made with the client communities.

The Agronomist (pay scale some RWF 200,000/month plus motorcycle and operational lump sum RWF70,000/month) considered that about 60 to 70% of his time was spent in agricultural matters. Administratively answerable to the Sector Executive Secretary - like his equivalent Agronomists in the 11 other Sectors of the District - he was reporting technically to the following District Technical Specialists[6]:

Agronomist

Environment Officer

Infrastructure Officer

Cooperatives Officer

Forestry Officer

Lands Officer

Sector population: 21,000; 4,700 households; 37 villages; 4 Cells

Agronomist Performance Contract 2011 – 12 (the Indicators document listed other performance indicators (not read by team) for other staff in subsequent pages)

	Subject	Benchmark	Performance Indicator for Budget Year 2011-12
	AGRICULTURE		
1	Land consolidation	402 ha cumulative to 2011	Increment 50 ha
2	Soil protection	Previously 20 ha	400 ha on hillsides
3	Maize mean yield	Not significant: crop failure from drought	4.5 t/ha
4	Greenhousing for vegetable production	None	1 Greenhouse/cell-cooperative
5	Mechanised cultivation by tractor	None recorded yet	10 farmers
6	Establish farmers field school	None	I school for maize cultivation
7	Post-harvest storage	None	Achieve 50 t gross storage/cell;

[6] Their pay scale is some RWF 308,000/month; aggregate +/- RWF 1,848,000/month

Aggregate direct cost of District's 12 Sector Agronomists (excluding motorcycle) is RWF 3,240,000/month

The overall ratio of District Technical Officers to polyvalent Agronomists is 1 : 2.

			there are 4 cells (i.e. 200t)
	SERVICES		
8	Training of cell-cooperatives in business planning	None	10 cooperatives trained
9	Training cooperative committees in cooperative law	none	10 committees trained
10	Sensitising farmers to benefits of visiting national agricultural shows	No data	20 arable and/or livestock producers attend national show(s)
11	Establishment of viable livestock cooperative	There is none performing well	One livestock cooperative registered and established
	LIVESTOCK *(in collaboration with RAB Sector Livestock/ Veterinary Assistant)*		100 cows financed by KWAMP; also other stock donated directly by farmers and from fundraising
12	Give cattle and/or small animals to poor households	Ongoing	100 cows financed by KWAMP; also other stock donated directly by farmers and from fundraising
13	Vaccination (brucellosis?)	Ongoing	1,630 cattle vaccinated
14	Cattle artificial insemination by RAB Assistant	Ongoing	160 inseminations (or conceptions?)
15	Establishment of milk bulking/collection centre	None	1 new collection centre
16	Savings and Credit Cooperative (SACCO)	Currently in a wooden structure	Construction of a concrete SACCO building
	INDUSTRY		
17	Promotion of small industry	A "very small capacity" maize mill is owned and operated privately	One new (community) maize mill purchased and installed
	ENVIRONMENT		
18	Community training in environmental management	2 villages were trained last year	Sensitise all 37 villages in the Sector
19	Strengthening of intellectual capacity of Land (Resolution) Committees/*'Abunzi'*	-	*With support of Sector Legal Officer,* introduce (tertiary) educated members into Committees to raise Committee capacity to resolve land conflicts
20	Afforestation	246 ha accomplished in 2010 -11	Plant trees on 295 ha of Government land
21	Energy-efficient stoves	-	Achieve supply and use of stoves by 2083 households (out of 4,700 in the Sector)
22	Bio-gas systems	17 households acquired bio-gas systems in 2010 - 11 and these still function	Establish systems in 15 more households
23	Roof rainwater harvesting for domestic use	-	Establish systems in 10 households

Discussion:

Communication with District Council: phone and handwritten communication need urgently to be supplemented by e-communications, i.e. electricity supply and ICT.

Statistics capture, data analysis and reporting: these are not standardised. Standard methods and formats need to be introduced and adopted.

Land consolidation: in general farmers have welcomed this initiative and seen virtue in economies of scale from joint (parallel) action

Mechanisation: farmers consider mechanisation is too costly.

Maize yields: There is periodic drought in this and 3 other lowland Sectors (out of the 12 in the District) for which there is no remedy other than to substitute drought resistant crops such as sorghum. Farmers on consolidated lands in the valley have abided by directives to plant maize annually *(although some would have preferred to hedge risk by cropping also with sorghum)* in each of the past 4 years for which the respective yield patterns were:

Good; Excellent; Moderate; Failure

2012 is expected to be good

Flood is also a risk

Crop Insurance

JNP: does insurance exist in this Sector

A: No. But Banque Populaire has entered into an arrangement with MINAGRI for an insurance system based on "weather index" (mostly related to drought/evapotranspiration) where more than a 15% variance on 'the norm' triggers a potential insurance payment on the extra variance. This system relies on faithful data captured by the Meteorological Office.

MINAGRI awaits supply of a respective Meteorological Station/equipment in this Sector; 45 of these new Met. Stations are planned in the District. Meanwhile (against the unimpressive local lowland performance since 2008) the pro-maize policy continues to be officially propagated and applied while examination of possibilities for irrigation (where feasible) continues…..

Environment: The main issue is loss of watershed forest cover. Trees planted (e.g *Eucalyptus spp.)* sometimes succumb to termites. Termite resistant species (*Senna spectabilis, Grevilia spp.; Albizza spp.; Calitris*) are known and can be selected. Tree planting is a component of Umuganda in the District.

SIDA 08/11/2011

Notes on consultation with Janvier NTALINDWA, SIDA 08/11/2011,11:00 – 12.35

Name	Position	Organisation	Telephone	e-mail
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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JP introduced the team of consultants and gave briefly the aim of the SEA study. The EU needs to integrate the SEA in SPAT3 and in rural roads feeder program. The team of consultants has more to learn from SIDA experience in ENR programme coordination and management.

JN: He said that SIDA is involved in ENR (land, forestry, water resources management) and supports REMA. He highlighted that he should be hopepul of actions implemented by MINAGRI and MININFRA were sustainable. SEA study is new in Rwanda: It is a good think for EU and MINAGRI. During the chairmanship of ENR SWG, he noticed that there was a duplication in various actions. So, the lack of coordination between environmental sub sectors should be corrected. Concerning water

management issue, he said that water resources management is under MINIRENA through RNRA, and water supply is under EWSA. EWSA is very interested by soil erosion control.

He also highlighted that there was a lack of coordination in the environment sector, even between REMA and MINIRENA there was duplication. JN talked about the lack of water availability study, it is a big issue. The quality of water is under RNRA, and if the team of consultants needs information, Mr Vincent Kabalisa should be contacted.

JNP: he asked about indicators of water quality.

JN: there is a problem of baseline data: SIDA emphasised on baseline data because it didn't support any project without proper baseline.

He asked if MINAGRI understand the SEA. His point of view was that MINAGRI and MINIRENA should sit together and should discuss about indicators. Coordination mechanism within technical ministries is supposed be there, but the reality is other think.

JP: SPAT3 will be finalized in middle 2013, this SEA is an opportunity to harmonize coordination mechanism.

JNP: he highlighted the lack of capacity at sector level and there was a big issue

JN: he said that many people complained of that issue, there was a need to solve a problem of capacity at all levels in particular at district and sector levels. The duplication of roles between technical ministries and MINALOC is also problematic. There was no the right people at the right place.

JP: said that there was a budget used in technical assistance and he will discuss that matter with EU (afternoon)

JN: there was another problem: MINECOFIN sent to all technical ministries the reporting format, but unfortunately the reports were not on the same format

JNP: the land consolidation and climate change adaptation should be clarified.

JN: Even Dr Rose of REMA and many stakeholders were not agree totally with land consolidation. But the government was focused on food security and sometimes adverse impacts exist.

Concerning agro forestry, JN said that in Rwanda, we have to learn what are done in other countries. For example in promoting agro forestry based communities.

In general in Rwanda, there is a good will, but the implementation is, in some cases problematic.

He closed the discussion by the division of labour between donors.

SIDA is involved in ENR with Dutch, BTC ; DFID ...

JP: He thanked JN for the discussion and informed him that next Monday there is a kick of meeting with MINAGRI and EU, it will be an opportunity to highlight the capacity issue at local level.

DUHAMIC, Rural Integrated Development Action (NGO) 09/11/11

Consultation meeting with Executive Secretary, DUHAMIC, Rural Integrated Development Action (NGO) 09/11/11 14:00 – 14:50

Name	Position	Organisation	Telephone	e-mail
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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

IB: Duhamic was established in 1979 and has several operating divisions including agro-processing (grain milling into flour) at this site and forestry development. There is a joinery and furniture division and Duhamic also promotes small-scale energy-efficient mechanisation for processing. Flour is produced for various buyers, including Ministry of Health which requires mineral and vitamin supplementation in some grades; soya is also used to enrich maize flour for some other buyers.

Partnerships include USAID and the EU.

It is involved in water supply projects and education programmes.

Forestry encompasses reafforestation, agro-forestry and farm fruit trees.

Agro-forestry is multi-purpose: soil protection; forage; poles; and 'notions' of carbon fixing…..

It is preparing a proposal for a big new forestry development scheme based on past experience with two successful programmes as below on 'empty hills and vacant fields':

S Province: Nyguria 1,050 ha

N Province: Rulindo 1,000 ha

Part of the objective is to monetise forest resources for the communities.

Duhamic's forestry activities are income-generating tree planting programmes in which planting workers are paid some RWEF800 (about Euro 1) for a day's task; Government pays about RWF1,000 but has a reputation for not paying as promptly as Duhamic; hence the pricing edge…..

One of the forestry schemes is a collaboration with IFDC (better known for fertiliser promotion).

ISAR advises on tree species selection (under a MINAGRI policy)

Forestry tactics

In 2008 – 2010 the focus was on Government land (EU funding)

Since 2010 the focus has been wholly on private land (IFDC project supervision with Netherlands funding)

We should keep in mind that across the nation, Government land may be no more than 10% in many areas. Nearly all the land is privately held.

Kirehe

We discussed the innovative scheme of the District Council to adjudicate forest land use (i.e. the trees only) on State Land to communities who might include intercropping between juvenile trees. We were warned to be cautious about our first impressions of Kirehe in the field: it used to be under-populated (pre-1994) but within the last 20 years has experienced considerable immigration from other Provinces and foreign immigration from neighbouring countries; culturally it is a melting pot.

Terracing: virtues of progressive and radical methods were discussed; the latter is expensive and needs maintenance.

Effectiveness of environmental management: IB considered the most effective implementation took place at Sector level. High ratios of households to agronomists was considered.

IB considered that the **'NAFA' arm of RNRA had well motivated, well-paid staff but was weak in execution and useful only for planting trees; not significant as a policy, strategy and enforcement body**. It was not achieving any useful reach at Sector level.

We discussed the search for human resources to guide and support environmental activities at Sector level. The existence of the specialised 'one cow' veterinary assistant at Sector level was cited; the only other example of reasonable specialised 'coverage' by a public body at this level was the Health Service, typically offering at least one Health Centre (Medical Assistant) for every one or two Sectors.

Marshland: siltation of new farms from upstream soil erosion is a serious problem in some areas; we will see that in the field.

Rwanda Bureau of Standards 09/11/11

Note on Consultation meeting at Rwanda Bureau of Standards 09/11/11 16:30 – 17:55

Name	Position	Organisation	Telephone	e-mail
Bugabe, Dr. Mark Cyubahiro	DG	RBS/ORN	+250 252 582 949 Mob: +250 788 304 197	markbagabe@yahoo.co.uk mark.bagabe@rbs.org.rw
Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

To: Dr Mark Bagabe, DG RBS/ORN e-mail sent 10/11/11

Dear Dr Bagabe

Thank you very much for our meeting at RBS, Kicukiro on 09/11/11 at 4:30 which benefitted also from your background in the Agricultural Research System up to 2009. The RBS Quarterly Newsletter No 12 for July-Sep 2011 contains a wealth of information on RBS responsibilities, activities and schedules. I explained the background of our work and the key issues that were becoming the focus of our further investigations.

Our discussion covered pesticides, fertilisers and mycotoxins.

1. We decided that **mycotoxins was an issue outside the direct scope of Agriculture SEA** and related to consumer health which RBS would continue to work on with MINICOM.
2. We agreed that **fertilisers were of concern** because – as was separately voiced at our recent stakeholder workshop 02/11/11 – you considered more applied research was required to determine optimised systems of composting (sink/sponge for excess nutrients?) + non-organic commercial fertilisers and effects on soil structure. This work could be facilitated by the closer linkage now existing between Research and Extension. I

appreciated your explanation that good messaging as to fertiliser, types and application dosages and intervals was already being provided by RAB through radio.

3. You remarked that **pesticides** – featured in the RBS newsletter - deserved similar attention on the media (to fertilisers) but were in fact far more demanding in management/safety thresholds and really needed the same regulatory rigour as pharmaceuticals: licencing of traders and technical training of sales staff. You highlighted the risks (to operators, physical environment and consumers) attaching to a) pesticides containing heavy metals; b) pesticides dressed on produce immediately before harvest; and c) some harmful interactions with beekeeping.

You raised the challenge of the need for:

a legal/regulatory framework,

review of the list of approved and banned chemicals, based on international norms

licencing of distributors and basic certification of sales personnel

determination and promotion of safe dosages, handling systems and pre-harvest intervals based essentially on manufacturers published recommendations (as may require to be adapted to local conditions)

training (ToT) and respective (pesticide use) certification of extension staff (Sector and District)

active, more decentralised involvement of RAB agro-chemists at the Provincial - District level

Farmer field schools (*as are already factored into MINAGRI's IPM strategy supported by BTC/Dr Jean Pierre Busogoro)*

verification that the production system (i.e. on farm practices) are chemically safe

I note that these steps essentially amount to adoption of principles of ***good agricultural practice*** (g.a.p.) as may already be evident in the tea and coffee export industries (?).

You explained that MRLs already exist in Rwanda based on CODEX + FAO guidelines/standards; however the focus needs to be on assuring safe production practices rather than intercepting contaminated product for rejection.

We discussed the ***need for increased numbers and requisite technical competence of extension staff at Sector level.***

I agreed to follow up on these points with MINAGRI/(NAEB) DG Certification, Ms Beatrice Uwumukiza and to try to see evidence of actual practices in the field. ***Possibly some of the challenges you identified have been or are now being addressed through the MINAGRI IPM programme……***

4. For **monitoring of the environmental safety of manufacturing/agro-industrial processes** (e.g. new investments proposed to RDB) you explained that your environmental chemistry arm provides the capacity to give REMA guidance on such issues. This is an area that was brought to our attention but – as you already have the institutional capacity to deal with it - I believe does not warrant our further attention. If required, we can reconsider this issue.

5. On a separate note you kindly encouraged our team to engage with **RAB's small team who cover Environment and Forestry**. We will follow that up.

6. CONCLUSION: The systematic presentation that you gave me about **pesticide concerns** convinced me that – to assure integration of 'safe use of pesticides' into future support measures for agriculture - it will be important for ***MINAGRI and its decentralised counterparts*** to devise a suitable strategy and timetable for making safe trading/distribution and use of pesticides at grass roots effective through an **adaptation programme spread over some 3 or 4 years** where the stepped progress would be monitored using the checklist at 3. above as a basis for planning and possible negotiation. The 'safe trading' aspect may need MINICOM's intervention……

The initial and recurrent costs of implementation of such a programme would of course need to be factored into considerations by the MINAGRI, RAB, and MINALOC/Districts budgeting arms.

Many thanks and we look forward to further discussions with you after we have consulted MINAGRI further and undertaken some investigations in the field. E&OE.

Kind regards

John

Team Leader *Rwanda 17 October – 22 December 2011*

Strategic Environmental Assessment of the Agriculture Sector in Rwanda

MINAGRI 10/11/2011

Consultation meeting with MINAGRI M&E Managers at MINAGRI 10/11/2011 16:05 – 17:15

Name	Position	Organisation	Telephone	e-mail
Sussock, Alastair (ASK)	SPPC coordinator	MINAGRI		sussock.minagri@gmail.com
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As e-mailed:

Dear Claude

We look forward to our follow-up meeting with you on Monday 14 Nov at 11:30.

Thank you for our meeting today at 4:00 with Alastair Sussock that marked a start to our familiarisation with the MINAGRI internal M&E system, as relates to environment.

Alexis and I explained the point reached in our team's analysis of 'official' indicators as in the list (from our Scoping Workshop of 02/11/11) that I provided.

You confirmed that the CPAF indicators are very important because they are SBS triggers for the development partners in the Agriculture SWG.

You both explained that SPTA's framework was not yet being regularly and consistently monitored and it was not institutionalised. Moreover, at District level respective data collection was at best patchy for subjects such as soil erosion although through **Projects and CIP** it was possible to gather some useful physical achievement statistics as well as reliably aggregated fertiliser consumption data.

You remarked that MINAGRI had already concluded that its M&E framework had not adequately integrated Post-harvest and Financial considerations.

Internally MINAGRI has devised its own Excel Logframe of "headline indicators" that "really matter" encompassing three key areas, i.e. Agricultural Growth; Poverty alleviation; and Malnutrition for which there are some 10 outcome indicators and 20 output indicators.

This Logframe will be used internally until a new set of indicators (hopefully to be harmonised with indicators to be applied by other sectors) is devised for EDPRS and, in turn, SPTA 3

There have been some important developments:

MINAGRI is aiming to harmonise its M&E system(s) with the African continental CADAP programme (under NEPAD) and – as you personally are tasked – more particularly with the respective Strategic Analysis and Knowledge Support System (SAKSS) championed by IFPRI. Under this system 'Agriculture' has far wider definition than as institutionalised in Rwanda; it embraces other natural resources, forestry, etc.

You asserted that there is already a common desire within central Government to establish a Common Indicators Framework across all the sectors at District level from health to forestry to agriculture (to name a few) to overcome the burden of duplication now taking place between District reporting frameworks to a) technical ministries on the one hand and b) to MINALOC on the other. SWAp groups have been examining this conflict.

DFID's consultant, 'Ian' has been assisting you to devise a targeted, prioritised ***internal M&E system for MINAGRI*** and his final report is under review. DFID support has now closed but MINAGRI will adapt the recommendations to 1) enable other identified necessary indicators under SAKSS to be incorporated and 2)

incorporate requirements prescribed by MINECOFIN. It is a quarterly reporting template that will be sent to both the Prime Minister's Office and MINECOFIN.

At the conclusion of our meeting we agreed that it would be desirable (when we meet on Monday 14th) to agree on the environmental, local capacity and M&E factors that Alexis and I should examine in the course of our forthcoming fieldwork (from 15 Nov) in the Provinces and Districts coordinated by RAB. We would (progressively) share our findings with you and ENR Sector upon our return. It would be our intention to agree two important matters with you (and ENR Sector) BEFORE writing our recommendations and before the Stakeholders Workshop on 08 December:

Environmental Baselines from which to measure performance (see the checklist in our Scoping Report)

SMART Environmental Performance Indicators and their timelines (as potential SBS Variable disbursement triggers)

Meanwhile, as agreed, before we next meet we look forward to receiving from you:

Logframe of internal Headline Indicators

Report of the DFID consultant

The description of the CAPAD/SAKSS framework with which you wish to achieve full compatibility (can you list all the factors?).

Please REPLY-ALL with this information so that our colleague Dr Juan Palerm is also included in copy of the documents.

We note that due to time constraint it was not possible to gather this information for our draft Scoping Report (now due for release) but this information may provide a useful additional foundation for refining the approach to our next phase of work.

RALGA, 11/11/2011

Notes on consultation with Marie Chantal, RALGA, 11/11/2011 11:00 – 13.10

Name	Position	Organisation	Telephone	e-mail
Marie Chantal Rwakazina (CR)	Deputy SG	RALGA	Mob: +250 788 309476	rwachantal@yahoo.fr
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JP introduced the team of consultants and gave briefly the aim of the SEA study. The EU needs to integrate the SEA in SPAT3 and in rural roads feeder program. The team of consultants has more to learn from RALGA experience in decentralised aspect, essentially in capacity building at district and sector level.

CR: she presented RALGA (Rwandese Association of Local Government Authority) background. RALGA represents all 31 local governments in Rwanda, comprising 30 district councils and the City of Kigali. All are in membership.

RALGA came into existence in 2003.

RALGA is a civil society organization which has 3 mandates : representation, of members, lobbying and advocacy on their behalf, capacity building.

RALGA' s vision is "to have local governments that respond to the demands of people, that are just, democratic and participatory, and which are citizen, investor, and donor friendly".

RALGA needs to continue to invest in maintaining and enhancing relationships with MINALOC and MINECOFIN which are of utmost importance for the Districts. RALGA Executive Committee and staff members also visit and involve counterparts from Central Government in their work.

JP: He asked the question about communication with MINAGRI; MINIRENA and REMA.

CR: RALGA is a member of SWG of decentralization and recently is member of agriculture SWG. RALGA is also member of some sub sectors working group of health but not yet member of ENR SWG. Concerning lobby, now there is a focal point in MINALOC, the DG in charge of governance and territorial administration who works closely with deputy SG of RALGA. AR said that working in environment sector is very hard now.

JP : asked the question about budget allocation in Districts.

CR: there are a budget sent to all districts by MINECOFIN (5%), earmarked budget for implementing some projects(terracing, feeder roads..), and revenue collected by districts.

JP: the problem of M&E is highlighted

CR: data collection should be made from villages to sectors. NISR wants now to harmonize data collection but currently the formats are not harmonized. Capacity on individual level is not an issue, because it should be built, the problem is the monitoring framework in general. MINALOC doesn't follow adequately performance at district level. Another problem is that MINALOC has a governance responsibility but various technical services are under respective ministries. And the proliferation of government agencies complicates decentralization process.

Concerning DDP, RALGA develops now tools through a South African company. Increasing a number of staff at sector level is very needed. The Executive secretaries at sector levels are young and dynamics, they need information on available budget for more planning and implementation.

CR highlighted the role of JADF at district and sector level. There are JADF commissions which are useful in planning: e.g an agriculture JADF in Muhanga district decided to modify choice of crop in land consolidation process.

CR thanked EU for initiating the SEA of agriculture sector which is a good exercise, even other ministries should do the same.

KFW, 14/11/2011

Notes on consultation with a team of KFW, 14/11/2011 10:00 – 10.50

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Annelyse Umunyana (AU)	Governance Advisor	KFW	Mob: +250 788 301171	annelyse.umunyana@kfw.de
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Duraisaminathan Visvanathan (ND)	consultant	ATKINS		v.duraisaminathan@atkinsglobal.co

King Boen Tan	Consultant	ATKINS		

AU welcomed the team of ATKINS and SAFEGE consultants and said that USAID has the same project (feeder roads and asked the consultants (ATKINS) if they met with USAID staff.

ND: he said that there are some donors who are involved in feeder roads support (Dutch, EU, USAID...). The MININFRA and RTDA are the main partners but MINAGRI is interested by feeder roads as a component of post harvesting support.

NA explained EU SBS in feeder roads sector and highlighted that there are 3.8M euros in capacity building at district abd sector level. ND asked to AU how she evaluated capacity at local level.

AU: she explained how KFW works with (RLDSF (Rwanda local development support fund). KFW gives money to RLDSF and there are funds which are sent to TIG (travaux d'intérêt général) and to ex combatants through national commission of demobilisation. Rural feeder roads are in same cases constructed by TIG and ex combatants. Concerning RLDSF, AU recommended the team of feeder roads to contact Mr. Sibomana, in charge of feeder roads in the agency.

MM: she highlighted the lack of capacity at local level and said that qualified engineers and senior technicians don't like to work in rural areas, and it should be better to see how in projects incentive measures could be taken.

ND: he said that team will go on field to notice the reality and discuss with local authorities. He agreed with KFW on the importance of HIMO approach and the importance of capacity building of local staff.

RAB Soil Conservation and Agro-forestry research-extension staff 15/11/2011

Consultation meeting with RAB Soil Conservation and Agro-forestry research-extension staff at RAB Forestry Research Department, Ruhande Arboretum, Huye 15/11/2011 14:30 – 17:15

Name	Position	Organisation	Telephone	e-mail
Ruganzu, Dr. Victor (VR)	Director Natural Resources Management (NRM)	RAB, Western Region	Mob: +250 788 562 938	rugavicky@yahoo.fr
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PREVIOUS RELATED MEETING AT 11:20				
Butare, Dr. Louis (LB)	Head, Southern Zone	RAB	Mob: + 250 788 532 075	l.butare@yahoo.com

PREVIOUS MEETING

LB had welcomed the team at RAB Zonal Office. He was dealing with an urgent problem of white grub that had broken out in several villages and was devastating root systems of major crops and tree species that killed the plants, especially tubers and legumes. He has over 10 years' experience as a crop breeder. Basic seed was supplied to RADA but there were problems of farmer acceptance; farmers preferred traditional varieties.

The Director of NRM Southern was away but his Western counterpart was present in Huye and could be met in the afternoon. This was arranged.

LB: crop intensification programme (CIP) includes cultivation of (rehabilitated) formerly uncultivated land. Agro-forestry – grown sticks are needed for climbing beans cultivation. They can yield 3 to 4.5 t/ha; intercropped they may give 2 t/ha.

Nyamagabe and Nyamoguru were as a steep slope targeted agro-forestry areas.

LB considered it was vital that contracts for radical terrace construction included agro-forestry establishment.

Topography of Eastern Province makes agro-forestry generally less necessary but in Southern, Western and Northern it should be an integral, key component of the farming system.

For flood relief MINAGRI, Ministry of Disaster Relief, REMA and MINALOC operate a joint venture.

Rwanda had been a major contributor to ICRAF/World Agroforestry Centre (Nairobi) technical development; the ICRAF agroforestry seed production and distribution centre had been operating under a joint venture with MINAGRI until 2009 but ICRAF had relocated its national cell to IRST. RAB still operated the seed centre. The Arboretum is considered to be the second largest collection of Eucalyptus spp. in the World.

RAB has some links with ASARECA (regional agric research body) in its beans and agro-forestry R&D.

NAFA provides some support to RAB agro-forestry activities.

Marshland farming is very vulnerable to sand contamination from hillside erosion.

The team's visit to Western Zone would pass Rubane so there may be a chance of another meeting….

There are a number of very technically skilled officers now based in MINAGRI HQ who now focus on administration and are rarely able to apply their technical expertise.

AFTERNOON MEETING

MU introduced the team. JP gave a detailed description of the issues that had been prioritised and enquired about the possibility of considering interactions between them and of any new issues not yet brought to the team's attention. The team also wanted to learn about MINAGRI's agro-forestry strategy and its results.

VR explained that soil erosion was a national problem but acute in S, W and N. River colour during rains gave a simple indication of the problem.

Erosion baselines date from before 1994; soil erosion remedies have been sought since the mid-colonial era.

PM: Catchment management and soil erosion control both need to be components of a holistic integrated soil management system and of the CIP. Environmental protection and productivity are intimately linked. Rwanda's soil and topographical maps, and GIS are available tools for planning.

This has been the subject of a thesis on adoption and the role of institutions.

Baselines based on monitoring a few targeted plots are not sufficient for gauging the gravity of soil erosion.

There was a discussion to explain the technical characteristics of Radical/Bench and Progressive terracing.

A past progressive terracing initiative pre-1994 supported by the EU had substantially failed because it was not integrated with the farming system and had not brought any (immediate) productivity gains. CIP and other workers now belatedly recognise that soil acidity amelioration with Trevertine lime (where required) at some 2.5 – 4 t limestone/ ha can – when accompanied by good cultivation, correct seed and the right fertility regime - provide sustained benefits for 4 or more crops (i.e. 2 or more years). Liming typically is not needed in Eastern Province.

LWH-style radical terracing is very expensive/ha; the same impact and benefits may be achieved from agro-forestry based progressive terracing and associated managed soil movement over a period of years.

A-F hedgerows yield a multitude of benefits including nitrogen fixing (if leguminous); fodder; leaf mulch/compostable residues, sticks, poles, timber and firewood

Progressive terracing does not give the highly visible quick-win benefits for erosion control of radical terracing yet the long term benefit may be just the same at a fraction of the financial cost. The same amount of capital invested may yield many ha of protected farmland against the possibility of barely one ha of farmland conserved from the 'radical' approach. Radical's particular visible feature during construction is its HIMO labour-intensive employment benefits.

There remains a long-term scarcity of organic matter for soil (mulch) improvement; agro-forestry can contribute to reducing this challenge

The RAB team considered it was vital that the CIP integrate an approach for progressive terracing and for affording liming prioritisation over fertilising because the latter may not be effective without the former.

Both of these interventions should get levels of financial/subsidy support currently afforded to fertiliser; they will also need more extension manpower.

RAB still monitors some pilot A-F sites where the results remain impressive. The respective research reports are dated +/- 1992.

It has to be acknowledged that trees are not always wholly beneficial: they can attract birds and insects that feed on crops; they need careful training/pruning management to contain completion with crops.

Hilltops and plateaus may be more suitable for agriculture than forestry; every plot of land with capability to be farmed should be farmed.

Trees should be considered as the preferred crop only where slope and soil conditions (e.g. acidity) dictate.

Steep slopes may still be capable of radical terracing for agriculture!

The RAB team said they could, if instructed, develop a concept paper identifying (mapping) broad land systems (slope; soil type; etc) where progressive terracing (and liming) should be promoted. They could estimate the ha that would benefit and the intervals of hedgerows required according to slope, etc to suggest how many linear km of hedgerows could be required (where not already present). The baseline could be zero terracing…….

The RAB team asserted that CIP should forbid use of inorganic fertilisers on (radical terrace) plots not yet protected by agro-forestry. They additionally expressed concern that CIP needed to be accompanied by adequate marketing systems; sometimes farmers could not find an outlet for the crop cultivated under CIP direction.

NUR - Soils 16/11/2011

Notes on consultation Innocent Nzeyimana, NUR, 16/11/2011 9.30:00 - 13.00

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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JP briefly talked about the objectives of the SEA study: the EU needs to be sure that environmental issues are integrated in SPAT3 and rural feeder road project. The purpose of the SEA consultants team is to learn from researchers how soil erosion and watershed should be managed for more sustainability. UE wants agricultural sector environmentally sustainable. JP highlighted key issues identified by scoping workshop meeting participants, among them: soil erosion control, marshland reclamation, feeder roads...

IN: He said that NUR has a bureau of consultants which can offer services to GoR and other institutions. He didn't know if there was a base line study in pipeline which will be done by NUR consultants.

JP:: asked how is his perception on soil erosion control.

IN: the soil erosion control in Rwanda is big challenge, so technical means are needed to handle the problem. MINAGRI has to go to NUR researchers and put new strategies considering various ecological zones. He focused discussions on GWLM study. Through the study, technicians are targeting now how to correct and protect soil adequately.

Gishwati project lies between Nyabihu and Musanze districts. It includes the Nyakiliba, Bigogwe, Kanzenze, and Kanama sectors of the Nyabihu district and Rambura, Karango and Jenda sectors f the Musanze district. Its agroclimatic zone ranges between Wet Highland to Wet Alpine frost zone. There are 6 different soil orders identified in the project site and all show very good soil fertility status with no acidity symptom. The soil depth ranges from bare rock to more than 2 meters in some areas. However, the land with soil depth more than 1 meter covers more than 85 % of the area while the bare rock covers not more than 0.5%. The slope gradient in Gishwati ranges between 0% and more than 60%. However, the slope less than 40% covers about 73% of the total area. By any standard, the land has high potential for production

However, as much as there high potential for economical production, the area is located in excessively high rainfall area. The potential evapotranspiration is limited since it is in highland, frost and alpine frost zone. Though limited in area coverage, the steep-slope mountains are sources of speeding floods. The deep soils are underlain by rocky material. The cumulative situation makes it prone to landslide and soil erosion that affects the human settlement and the land by flooding and siltation. It is indeed a site of paradox where the high production potential the site is adjoined by a number of challenges that need technical perfection in its utilization.

GWLM is a pilot project but the idea is to plan land use for all the country if there is success.

LWH has various sites in the country; Nyanza, Kayonza, Bugesera, Karongi districts, the technologies developed are different because agro climatic zones are different also. The water catchment management is a choice of LWH. The land husbandry doesn't exist, it should be a good tool in land use planning.

JP: asked a question on physical characteristic of new terracing.

IN: based on GWLM, the terracing should be based on various parameters (slopes, soil characteristics, people settlements, rainfall…). He showed maps of different ecological zones and said briefly which technologies could be adopted.

He highlighted that liming is needed for of big part of soil in Rwanda. He said also that organic is useful for CIP because if fertilizers are used without organic matter there is a problem of mineralization which is a big issue. For CIP, I is better o combine liming with organic matter. AGRA and IFDC adopted the technology and could extent to CIP.

JP: he believed that combination of agroforestry and terracing should be better in sustainable agriculture.

IN: the technology is good and some MINAGRI projects like LWH, KWAMP use now agroforestry in watershed management.

At district level, the technology should extend the watershed management. But as there is a lack of capacity at district an sector level, capacity building is required.

NUR Applied Entomology Dept 16/11/2011

Consultation meeting with NUR Applied Entomology Dept at Ibis Hotel Huye 16/11/2011 15:10 – 17:15

Name	Position	Organisation	Telephone	e-mail
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JP explained the omission of the Stakeholder Workshop (02/11/11) Work Group that should have been established for 'environmental risks of pesticide use'. He invited MEM to give his opinion on this issue and its nature and scope.

MEM provided an extensive description of his career path towards his present position. He is running a research programme of 18 students conducting random yield trials on Pyrethrum cultivars from Rwanda and nearby countries where botanical descriptors/traits are being applied to categorise cultivars. The State owned 'Sorpyrwa' Pyrethrum extraction plant is working below capacity; it is (after Kenya) the plant with the second largest processing capacity in Africa but perhaps it is working at only 30% of capacity. The next stage would be to run trials in different agro-ecological zones. JP asked whether synthetic pyrethroids were more economically attractive to customers. MEM said the international market for natural pyrethrum was 50% undersupplied. He added that it has multiple uses including cosmetics and medicine; the plant could be used for animal feed and fertiliser.

JP explained how, alongside government issuing a list of prohibited chemicals, RBS had proposed stepped measures to support and enforce safe trade and handling of pesticides. MEM emphasised that integrated crop management (embracing IPM) was the best approach to P&D control; pesticides were solutions for emergencies such as the white grub problem now confronting RAB Southern Office. MEM expressed interest to help RAB identify the species, host plants, life cycle/vulnerability and possible control measures.

The importance of farmer field school methodology for training farmers in surveillance/scouting for Pest Risk Analysis was stressed by MEM. But, he considered there was an absolute shortage of applied

entomologists nationally and that young scientists with an aptitude for this work invariably took the 'easier option' studying plant pathology as a basis for their future career path. He said sample collection and identification was an exacting task that often need referencing with insect collections in museums in other countries such as UK and Netherlands. He considered RAB's research arm had good equipment (ELISA; PCR) for plant pathology but was less suitably equipped to cope with applied entomology.

MEM suggested there was a need for closer crop-livestock integration, e.g. by introducing fodder grasses alongside maize in lowland drier areas to provide an alternate host to Striga of which the eggs may stay dormant for up to 20 years.

The need for integrating the (now closed project) Centre for Information and Communication in Agriculture (CICA) into the regular MMINAGRI/RAB system was mentioned by MU.

Antestia coffee berry bug and coffee berry borer were mentioned by MEM and he described former extension measures to prepare farmers (with disease recognition training) for a possible invasion of coffee wilt from neighbouring countries. The attributes of tea as a good anti-erosion crop in hilly acidic soils were raised.

Conclusion: this discussion did not shed any new light on 'environmental risks of pesticide use' and may have diminished its importance relative to other issues that have emerged. It identified an absolute shortage of applied entomology talent nationally.

Vice-Mayor (Economic Development) Nyamagabe District and Executive team of Kitabi Sector 17/11/11

Notes on consultation in Southern Province with Vice-Mayor (Economic Development) Nyamagabe District and Executive team of Kitabi Sector 17/11/11 10:05 – 12:45

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We passed through Nyamagabe Town, some 30 minutes out of Huye. Kitabi is 58 km (90 minutes) from Huye along a good, winding highway and is at an elevation of about 1,900 m; surrounded by privatised company tea and smallholder tea plantings, mixed farming and (mostly) eucalypt woodlands on the steeper slopes. It is a 'gateway' to the Nyunge Forest National Park which stretches across a series of N-S mountain spines for many km into the distant haze.

Later we were taken to a climbing bean seed production group who farm RAB's Radical terracing (20 or more years old). This is adjacent to Eucalypt and other exotic species planted 30 or more years ago in the Forest's designated Buffer Zone at Sigira, 11 km beyond Kitabi. The bean seed is marketed with assistance of RAB to producers who are facilitated by NGOs such as World Vision in other Districts.

Charcoal production is a sustainable use of eucalypt and charcoal kilns were seen being prepared in the Buffer Zone; the zone also hosts a beekeeping cooperative.

In the introductory meeting at Kitabi Sector Offices, MU introduced the team of consultants and briefly explained the aim of the SEA study. AG translated for the benefit of JP.

'Infrastructure': Nyamagabe District Council recently made a decision to equip its Sector Executive Secretaries with 'Blackberry' mobile phone/e-mail devices in addition to the already established e-communications between Sectors and the District. Moreover, Village Coordinators and Cell Executive Secretaries have Tiga pre-paid mobile phone credit for the restricted District and Sector phone numbers.

Conclusion: this is a much more advanced system of communication than was reported to us for Kirehe District.

The Vice-Mayor of Nyamagabe felt the 5-year District Development Plan was a very important planning instrument, grounded in a highly democratic formulation process starting at the grass roots.

AG separately observed that this District had been a major recipient of CIDA assistance.

Each village typically has 150 households and 5 elected members in its Council (one is appointed by each group of 30 households).

Kitabi Sector includes 5,655 households, 5 Cells and 30 Villages/Umudugudu.

Executive staff of the Kitabi Sector includes a Forester paid by NAFA and the (one cow) Veterinary Assistant. The Agronomist took up his post in early 2011.

The record of current land use on the total of 5,300 ha is:

Forest 1,645; Tea 1,745; and crops 1,910 ha

Kitabi has successfully 'protected' a total of 5,141 ha or 95% of its land; only some 159 ha need 'protection'. JP's question whether 100% protection would be achieved by 2013 went unanswered.

Partly for anti-erosion reasons, some on-farm households at Kitabi centre are to be (forcibly) relocated to a village where they will benefit from infrastructure and electricity. Government wishes to encourage village settlement.

EZ considered that the Kitabi sector area of 1,645 ha of forests/woodlands was owned as to 75% private; 15% tea companies and 10% Government (RNRA). The Sector was allowed to conserve, maintain and utilise the RNRA woodlands in a joint-management + Umuganda arrangement where some taxes on sales would be paid to RNRA but most of the proceeds would be retained by the Sector for important social uses including meeting special needs of vulnerable households (e.g. if/when there was crop failure). Today was a special Umuganda day for forestry being supported by the Vice-Mayor; it included some prisoner/on probation prisoner work parties.

EZ highlighted the importance of bottom-up Imihigo cropping commitments that start at household level. RAB is promoting 5 crops: Wheat, Irish Potato, Maize, Beans and smallholder Tea.

This year's wheat 'plan' was 580 ha

Only Maize (490 ha this year) attracts the CIP package of seed (on seasonal crop loan/credit arrangement) and 50% subsidised fertiliser (fully paid up front).

The respective areas of crops and types of terracing (radical; progressive) existing are reported monthly by the Sector to the District.

DEN explained that (grass-faced) radical terraces need almost no maintenance whereas progressive terraces always needed trench clearing (for water flow). He considered progressive terraces needed agroforestry to reinforce their stability and said even the radical terraces (as visited) needed agro-forestry. He felt farmers would readily plant on the bunds if the right seedlings were provided (by RAB) at the right time. He had confidence in Panicetium grass for bunds as it was a useful fodder grass and said the

following two leguminous tree species were very suitable for A-F on terraces: Caliandra; Leucaena. Moreover they offered 'sticks' needed in large quantities by climbing bean farmers.

Some photographs were taken of the landscapes seen.

Conclusion: the itinerary had provided a useful meeting with Sector staff to learn about routine environmental management and discussion of + good exposure to physical challenges in soil conservation; District staff were not available for a detailed discussion.

Ruhango District agronomist, 18/11/2011

Notes on consultation, Ruhango District agronomist, 18/11/2011, 10:00 - 12.00

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JP briefly talked about the objectives of the SEA study: the EU needs to be sure than environmental issues are integrated in SPAT3 and rural feeder road project. In the past, the GoR focused on crop production, now the objective is increasing crop production and environment sustainability. The field visit in Ruhango district wants to notice some key issues (soil erosion control, feeder roads, pesticides use...). The team of consultants need to see problems and success. The purpose of the job is to help in environment management. The forst question he had was about technical staff.

FM: in Ruhango district, technical staff is : agronomist, forester officer, infrastructure officer, land bureau officer, livestock officer, environment officer. At sector level, there are : an agronomist, a forester officer paid by NAFA (RNRA) and a veterinary. In sector level forester and veterinary are under agronomist.

FN: forester officer at sector level protects forests (harvesting, planting and monitoring). There are wood lands of the government and private. Agro forestry takes about 20% of the forester time at sector level.

JP: technical questions on maintenance of terraces (radical and progressive)

FM:: it is very difficult to make them productive because radical terraces need liming, organic manure and seeds. The trees are planted on benches. Trees species planted are calliandra, leuceana, grevilea, cedrela.

JP: is there seeds stock?

FM: There is seeds stock. Funds of trees seeds come from NAFA. 20% of seeds are forest species and 80% agroforestry species. Trees seeds are given to farmers freely. The demand is higher than offer, and grevilea is most demanded.

JP: capacity at sector level

FM: in terracing, there is collaboration with environment officer of district. At sector level agronomist has more duties and has not time to implement adequately.

He highlighted the importance of agro forestry in soil conservation and in livestock .He talked about indicators of success in agroforestry which should be kilometers of agro forestry established and maintenance. If sector has enough resources, agronomist and forester should implement more in agro forestry.

JP: why forest officer is not involved in CIP?

FM: It is true forest officer is more involved in trees harvesting and planting but not in CIP. The CIP needs to be more productive to integrate agro forestry species for protecting soil and to support the "one cow, one poor family" and in same case to protect crop against wind risk (wind break ?)-

At sector level, forests officers cover 2 or 3 sectors and il should be better to have one per sector.

He also talked that land consolidation is made in marshlands, but at hillside there is resistance. Incentive measures are needed, for example in developing cash crops like green beans.

After meeting with agronomist, the team visited rice mill and geranium distillery, rice cultivation, zero grazing, terraces and feeder roads in Ruhango district.

LWH/RSSP, 21/11/2011

Notes on consultation Musabyimana Jean Damascene and Habamenshi Didace, LWH/RSSP, 21/11/2011, 14.00 - 15.30

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Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JP briefly talked about the objectives of the SEA study: the EU needs to be sure than environmental issues are integrated in SPAT3 and rural feeder road project. The purpose of the SEA consultants tam is to learn from LWH and RSSP how marshland reclamation , watershed management and hillside irrigation are implemented. The scoping phase finished and we are now in second phase of the study. As results of the workshop, there are priorised issues like: soil erosion control, marshlands reclamation, pesticides use...We had consultation meeting with RAB (Huye) and NUR. So, now we want to see with the team of LWH/RSSP how EIA s and EMPs are implemented and how EMPs are budgeted.

MJD: LWH and RSSP are funded by WB and it is EIA and EMP are required. There is a budget for EMP. For LWH sites (4), before starting EIAs were carried out and EMP for each site. Adverse impacts were identified and mitigation measures highlighted. The main adverse impacts came from dams and irrigation, land husbandry has no adverse impacts.

Some of adverse impacts are: water born diseases, accidents, siltation and salinization..

The study on water quality was conducted by NUR and a draft report is ready, it helps in continuous monitoring. There is now a baseline of water quality (nitrates, phosphates, turbidity, DBO, CBO, conductivity,..). In some sites there is an increasing of nitrates.

JP: CIP needs some accompanying measures

MJD: the major constraint is financial. For example the study carried out by NUR had a cost of 60 000 000 frw, so if these studies cover all the country, the cost should be very high. CIP should use results from that baseline.

The challenge is now soil conservation (chemical and physical)

JP: are EMP success and challenges? EMPs are implemented adequately?

MJD: of course, the budget is available and there are environment committees at all levels. For EMPs, LWH developed check list and prepared enough for implementation. The challenge is capacity at local level. REMA and RDB have to oversee national level. In term of human resources, that aspect shoub be reinforced.

DH: RSSPworks with cooperatives (rice, wheat, bananas, Irish potatoes). Each cooperative has an agronomist paid by RSSP and works hand in hand with local authorities. He has to monitor EMP activities. Under the cooperatives, there are small groups (amatsinda), and agronomist works ith farmers grouped in amatsinda. RSSP trains small groups leaders. The challenges are:

- Working with people under cooperatives (some farmers are not members of cooperatives)
- They are trying now to put somewhere hillside small groups and marshlands small groups.
- Users of watershed in near future will be involved in the management. The maintenance of terraces is the responsibility of the users, but farmers don't easily accept to monitor EMPs.
- Farmers have the resistance to adopt new technologies in CIP, awareness and discussions with them are required for best outcomes.
- Agro forestry is a good think are farmers know that, unfortunately green manure is not knew by them, it is why using agro forestry needs efforts in sensitisation of farmers through the syndicates and cooperatives. The zero grazing system should be use agro forestry: the farmers should integrate agro forestry leguminous in animal feeding and get animal manure which is useful for fertilisation.
- Cooperatives will not able to pay technicians after the projects, so it should better to reinforce small groups in maintenance after projects, because after development of marshland there is a hand over and marshlands are under district authority.

Post Harvest Task Force 21/11/11

Sent 22/11/11

Francois NSENGIYUMVA

Post Harvest Handling and Storage Task Force Chairman, MINAGRI;

Rwanda Cooperative Agency: Chairman of Board of Directors, Ministry of Trade and Industry 0788 306 812

Dear Mr Nsengiyumva

Thank you very much indeed for our meeting yesterday evening when you explained the Post Harvest Strategy and focussed on the progress achieved in establishment of grain drying and (50 tonne) storage centres. Thank you also for showing me relevant documentation.

You explained that some private 5,000 tonne consolidation centres had been erected (e.g. the centre seen by our team in Kirehe District) but that more integrated planning between rural feeder roads development and post harvest/consolidation/marketing planning was needed.

I hope other consultants and decision makers whose terms of reference encompass this integration (in the spirit enshrined in SPTA 2) will give the matter attention.

Unfortunately it is not in our TOR.

Soon I will meet Budget Earmarking Officer Eric MANIMPAYE to gain an understanding of how MINAGRI decentralised budgets (including the parts funded from SBS) for environmental application are targeted so may also learn a little about P-H budget application at that level.

I was pleased to be advised today that RTDA will attend a MINAGRI meeting for our further programme later today at 3:00

SEA Kick off meeting, MINAGRI 22/11/11

Agriculture Strategic Environmental Assessment (SEA) Kick off meeting, MINAGRI

22 November 2011, 15h30-16h50

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As circulated by PS, the purpose of the meeting was to:

- Receive the preliminary feedback to the draft SEA Scoping Report
- Receive reflections on the conclusions from the Scoping Workshop (the draft of Proceedings is a supplement to the Scoping Report)
- Confirm the strategy to be applied in the SEA Study (proposed in the draft Scoping Report) which has significant focus on local capacities and M&E systems for agriculture (& rural feeder roads) – environment interactions
- Review the adopted SEA fieldwork programme 15/11 – 05/12/2011;
- A.O.B: listen to areas of concern (IF not being addressed in the SEA plan) expressed by other key stakeholders present

Dr Rurangwa opened the meeting on behalf of PS MINAGRI explaining it had been necessary to postpone from the intended date of 14/11/2011. He said the Scoping Report had not yet been received by MINAGRI and regretted this and considered this might account for the absence of some of the invited stakeholders.

DZ explained that although the EUD had generally been satisfied with the overall effort, engagement and delivery of outputs of the Consultant team, further revision of a draft Scoping Report that had been submitted on 14/11/2011 was required to satisfy requirements related to methodology and logic. This revision was under discussion between SAFEGE and EUD.

RR invited SAFEGE Consultant's team leader to present scoping report's main findings.

JP explained that for participants who had not previously been involved there were slides available to provide background and purpose of the work if required. The status of bilateral consultations carried out was reported as follows:

- MINAGRI; NUR; MINALOC; MINECOFIN; RTDA; MINIRENA; REMA; RNRA; AfDB; IFAD; JICA; USAID; WB; CIDA; SIDA; RBS; INGABO
- Field: Three District Councils; KWAMP; Three Sector Executive Committees; *Umuganda* road maintenance and forestry initiatives; RAB/Provincial in progress

Yet to meet: MININFRA; MINICOM; other leading NGOs; other farmer syndicates; universities; processor associations

JP presented a summary of findings of the scoping report and highlighted environmental key issues identified by workshop meeting participants. He also said that fieldwork after the Scoping Workshop had already revealed some ***tendencies*** which showed a need to redefine some issues. Stakeholder consultations and especially Stakeholders' own analysis (e.g. Sector staff; District staff; RAB Research; NUR) were the new sources of the tendencies that had not been evident during the Scoping Phase. He said further enquiry and triangulation would provide the basis of objective analysis and synthesis

The prioritization of Key Issues generated by the stakeholder workshop of 02/11/2011 had been as follows:

Issue	**Score**

Soil erosion control	**14.9%**
Water catchment management and associated forestry	**12.9%**
Local capacities for good environmental management	**11.4%**
Adequacy and consistency of M&E systems	**9.5%**
Marshland reclamation	**9.3%**
Environmental risks of pesticide use	***9.3%***
Environmental integration into rural feeder roads	**7.8%**
Environmental/climate change risks of crop selection	**7.1%**
Impact of fertilisers	**6.8%**
Environmental risks of primary processing and agro-industrial activity	**4.8%**
Environmental impacts of increased livestock	**3.9%**
Transboundary impacts	**2.2%**
TOTAL	**100**

JP explained that team fieldwork coordinated by RAB Zonal Offices was following up on these issues, especially those with the highest ranking. Nevertheless the interview and enquiry process with stakeholders would continue to be open-ended and not focus just on issues as listed.

Having already completed a visit programme in Southern Province, the remaining timeframe for the team's work was projected in a slide as follows:

		Date	Calendar	KEY ACTIVITIES	TEAM LEADER	SECTOR EXPERT	Loc Exp
	Wed	**23**	39	2.3 - Stakeholder consultations and field visits	1		1
	Thu	**24**	40	2.3 - Stakeholder consultations and field visits	1		1
	Fri	**25**	41	2.3 - Stakeholder consultations and field visits	1		1
	Sat	**26**	42	2.3 - Stakeholder consultations and field visits	1	1	1
	Sun	**27**	43				
	Mon	**28**	44	2.3 Kigali Stakeholders; Review documentation and generate meeting reports	1		1
	Tue	**29**	45	2.3 - Stakeholder consultations and field visits	1		1
	Wed	**30**	46	2.3 - Stakeholder consultations and field visits	1		1
Dec	**Thu**	**1**	47	' " "; Travel to Rwanda (expert 2)	1	1	1
	Fri	**2**	48	2.3 - Stakeholder consultations and field visits	1	1	1
	Sat	**3**	49	2.3 - Stakeholder consultations and field visits	1	1	1
	Sun	**4**	50				
	Mon	**5**	51	Review documentation and generate meeting reports	1	1	1
	Tue	**6**	52	2.4 Prepare findings for Workshop 2	1	1	1

	Wed	**7**	53	2.4 Complete synthesis for Workshop 2	1	1	1
	Thu	**8**	54	**2.4 STAKEHOLDERS WORKSHOP 2: Issues and recommended Strategies/Means**	1	1	1
Jan 2012	**Sat**	**14**	91	2.7 Finalisation and Submission of SEA Study report AFTER STAKEHOLDER FEEDBACK	1	1	
	Sun	**15**	92				
				Phase 2 (days):	**38**	**25**	**34**
				Total (days)	**60**	**49**	**54**

JP reported that the SEA Stakeholders workshop was planned for 8th December. *As since confirmed by EUD,* the submission date for the draft Final report is 21 December.

JP invited participants to provide questions and comment on his presentation.

Comments of participants

In general, participants said they wished they had received a scoping report before the meeting.

TK: explained why the draft scoping report was not sent to participants before the meeting. He said it would be distributed after the meeting in its un-amended form for feedback up to 28/11/2011 and urged expression of comments and considerations from all participants.

DZ: he highlighted the importance of methodology in SEA study and invited the consultants team to make sure that the methodology is clear.

Some questions were asked like urbanization and its impact on environment in Rwanda, why feeder roads is not at the agenda of the meeting, some comments on invitation letter.

JP: he explained that urbanization issue is not mentioned in ToRs and that feeder roads aspect will be clarified by the next MINAGRI meeting with various feeder roads donors.

JP explained that the team could submit a final report in a form that took up the latest EU guidelines for the climate change issue, if required by EUD and MINAGRI.

RR thanked the presenter and participants and closed the meeting at 16:50.

LWH Project, Western Province 23/11/11

Notes on a field visit in Western Province 23/11/11 to Karongi 12 catchment/watershed project site of World Bank-funded Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project. *With corrections recommended by Dr JD Musabyimana*

Name	Position	Organisation	Telephone	e-mail
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			886	com

As previously reported (WB 26/10/11) LWH works in 4 main sites; Karongi 13 is nearby (not visited) LWH has a micro-watershed/catchment based approach. This command area may be some 235 ha (RSSP was 100 ha). A few are around 1,500 ha.

#1 intervention is erosion control – following slope categorisation

#2 is soil rehabilitation – typically 3-year program/site; includes lots of lime use

The site is located in both Mukura and Rugabano sectors of Rutsiro and Karongi Districts:

The Kivuruga ex-marshland seen in the first photo exhibits very poor maize growth due (probably) to siltation of the valley floor from past floods. It remains to be seen whether establishment of the dam irrigation source higher up the valley will change productivity on this valley floor. Lower down the valley (0.5 km) the soil was undisturbed and looked very productive under Irish potatoes.

Karongi 12 has 600 farmer clients and is a partly reclaimed valley where dam works will not begin until all anti-erosion measures on hillsides (radical terracing; check dams at 3 to 5 metres distance on steep water channels, etc) of the entire catchment have been completed. There will be a vegetative silt trap upstream of the dam. The water to be harvested is intended to be used in hillside irrigation of all lands downstream of the dam including the small valley. The major part of the command area to be irrigated is situated downstream of the Ndaba waterfall and it is 100% on hillside.

The site has three land units: The water catchment is covering 441ha, the command area catchment 456ha and the command area 235ha

All LWH catchments' engineering was mostly designed by Dr Aseni.

The Karongi 12 'Improved Bench Terraces' from HIMO appear to be constructed on slopes in the range of up to 50°. The recently constructed terraces mostly await agroforestry planting (Alnus; Calliandra; Lucerne, etc) which will include temperate and sub-tropical fruit trees; some drainage waterways are still under construction.

Farmers are organised into self-help groups based on land proximity. In 2010 they grew wheat seed for purchase by RAB.

They were employed in terrace construction at RWF1,000/day; they were paid by bank transfer to their SACCO accounts (no cash).

Terracing of the type seen requires HIMO of about 750 – 1,000 person days/ha. A good rule of thumb for establishment cost is RWF1 million/ha. Next add on the cost of tree planting, crop seeds and fertility management.

POST VISIT ANALYSIS:

We were told 1 ha of virgin slope yields some 1.1 – 1.3 ha of bench terrace surface area, including the terrace embankment (fodder grasses, etc).

At this site benches account for about 55% (Bench may go up to 70% depending on slope category***)of the total area derived which – if 1.2 ha - suggests that arable land yielded from radical terracing of 1 ha of virgin slope may be some 66% of the original surface area; but terrace facings additionally yield a potential 'forage bank' of 54% of the original surface area.***

Do studies reveal that the return to effort and investment (gross margin) of such a two-enterprise (cropping; livestock) combination exceeds the corresponding return from (former) arable cropping (only) of 100% of the unprotected slope?

ANSWER FROM JDM: "No formal study has yet been conducted specifically in karongi-12 site, however experience elsewhere in Rwanda has shown that well-constructed and managed terraces may increase crop production more than two times. In Karongi also the records on Irish potato production show more than three times production compared to the before project interventions. An impact assessment study is on-going."

It would appear that zero-grazed "one-cow" (or other ruminant) livestock must be integrated into the system to gain the full returns from exploiting the permanent forage resource offered by the terrace facing. In this scheme 45% of the farming system (by area only) established by terracing is or becomes a livestock-oriented system…… It would be useful to know the profitability/unit area of 'facing' that such a livestock system provides, i.e. in comparison with the profitability/unit area of the arable cropping of benches.

ANSWER FROM JDM:" this may need a deep analysis, but the experience has shown a production of up to 6 tons of forage per hectare of embankment"

It may be worthwhile to compare (in less precipitous cropping landscapes) the actual land area required by agro-forestry in progressive terrace development for effective soil conservation purposes. A figure of 25 or even 33% of the gross area under agro-forestry may be economically acceptable (in relation to the bench terrace strategy) IF it can

a)permanently secures the integrity of the soil;

b) raise the productivity of the (67 – 75%) land retained for arable crops AND/or

c) provide a fodder yield/unit area of agro-forestry that matches (or exceeds) the yield from bench embankments.

Comment from JDM: "The idea sounds good, however, we have to keep in mind that progressive terrace and bench terraces are two different soil conservation technologies which have specific advantage and limitations especially their fitness with regard to the landscape configuration (slope category). Surely, the progressive terraces cannot secure the integrity of the soil as the bench terraces do."

The achievement of a) under the LWH system has a cost probably in excess of RWF1 million/ha and maybe (if facings are not included, depending upon respective calculation) RWF1.5 million/ha of 'permanently' protected arable land.

Plots are limed before planting with crops, typically ground limestone at a rate of 5 – 7 t/bench ha at a delivered (tendered by LWH) cost of RWF35/kg or RWF35,000/t. This 'dressing' has the desired buffering effect on soil nutrient retention for up to 3 years or up to 6 crops.

At some 6 t/ha that is a material (only) cost of some RWF 200,000/ha and some RWF 35,000 to 40,000/crop. After that interval the process needs to be repeated unless high levels organic matter have been permanently (sic) incorporated into the topsoil.Labour recently required for dressing was 363 person

days for 14 ha; ***that is about 26 person days/ha and, if paid by the project….., adds a cost of RWF 30,000/ha. It suggests that a farmer with 1 ha may need to spend one month at least every three years dressing his/her land with 6 t of limestone to maintain productivity and (NPK) fertiliser response***.

Even with composting (below) of forest gleanings with farm manure and vegetative wastes, it may be unlikely that most farmers on such low pH soils will ever achieve the organic matter balance that their soils require; liming may be a permanently required practice.

Around the Karongi 12 settlements there are (3) grain drying and storage/consolidation centres (each blue roofing: 50 t capacity) established under the MINAGRI National Post Harvest Strategy.

Farmers are facilitated by MINAGRI under CIP with seeds and subsidised fertilisers (NPK; DAP; urea).

Within the project site some of the land is rented out by its 'owners' (about 20%). Rent costs were not disclosed.

Rugali Rice growers, Nyamasheke, Western Province 23/11/11

Notes on a field visit in Western Province 23/11/11 to ricelands of Kigoya marshland at Rugali Cell, Macuba Sector, Nyamasheke District

Name	Position	Organisation	Telephone	e-mail
Katana, Athanase (AK)	Soil and Water Research Officer	RAB - Western		
Nyirabashyitsi, Jacqueline	Sector Agronomist	Macuba Sector, Nyamasheke District		
Farmers		Tuzuzanye Farmers Association (rice)		
Ngirababyeyi, Mr	Farmer	Iracoga Farmers Association (rice)		
Usabyimababa	Professional in	MINAGRI	Mob: +250	madousa2020@yahoo

zi, Madeleine (MU)	charge of environmental mainstreaming		078879101	.fr
Gakuba, Dr Alexis (AG)	Local Expert	SAFEGE Consortium	Mob: +250 788 540 725	agakuba@hotmail.com
Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

This became an epic trip South along the Kivu lakeshore, 75 km from Karongi but (due to road conditions) just over 3 hours each way from Karongi. It had been scheduled by RAB-Western to demonstrate the water management problems faced by some rice growers who were not part of any project initiative. This is an Association of 40 farmers. The ricelands were developed in 2006 from marshland. Previously some of the land was farmed with cassava and potatoes under natural rainfall. A plot of 15 X 30 m (450 sq m) can yield 150 kg of milled rice that sells at RWF400/kg (RWF60,000); 2 crops/year. The farmers said this was by far the most lucrative enterprise they knew and enabled them to pay for necessities including medical 'insurance' and school fees. The land is rented from the Sector at a fee of RWF1,000 acre/year; this appears to be merely a nominal charge.

Milling by a private miller costs RWF20/kg; the farmers would like to own their own mill.

Bird-scaring is a full-time job after the 'ears' have filled. There is a disease problem and the farmers would like access to 'Benomyl' to deal with it (is this a banned chemical…?).

There is either too much or too little water, according to time of year. There are flood siltation problems on some of the rice fields. **Water diversion 'sluice'**: the wooden dam structure (tree beam cost RWF20,000) is used for water diversion to the feeder canal by covering with plastic sheeting. Periodically some of the timbers are washed away.

The farmers desire a permanent water diversion structure. Mr Ngirababyeyi said his (downstream) Iracoga Farmers Association (rice) faced the same physical challenge.

Conclusion: for a very small capital cost, the ease of water management could be transformed by investment in a suitable concrete structure with a sluice. It would need to be able to withstand flood surges periodically.

Recommendations on economic measures to control disease are required.

OTHER MATTERS

Features en route included several areas of (unexplained) abandoned bench terraces at Mobuga Sector:

Can they be brought back into production?

Imbaraga syndicate 28/11/2011

Notes on consultation Imbaraga syndicate, Musine Juvénal, 28/11/2011, 2.00-3.15 pm

Name	Position	Organisation	Telephone	e-mail
Musine Juvenal(JM)	Executive secretary	Imbaraga syndicate	Mob: +250 788574644	abahinzi@yahoo.fr
Gakuba, Dr Alexis (AG)	Local Expert	SAFEGE Consortium	Mob: +250 788 540 725	agakuba@hotmail.com
Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

JP briefly talked about the objectives of the SEA study. The purpose of the SEA consultants team is to learn from Imbaraga how agriculture is sustainably implemented and how environmental aspects are integrated are domesticated by farmers.

JM: Imbaraga is a syndicate of farmers (agriculture and livestock), created in 1992. The membership is 25200 in all the country. In each district, there is a board of 7 people, and there are executive secretaries for each province and one at national level. 25 districts are covered by Imbaraga, others are covered by Ingabo syndicate.

The challenges what have the syndicate:

- Many of members are small farmers with small crop land (0,4 ha)
- Food security, because of agricultural marked oriented. It is a paradox
- Extension services from MINAGRI (mixed cropping is a choice of farmers, no the choice of MINAGRI).

Small farmers are not interested by CIP specialisation, even land consolidation in general. Essentially in Southern and Northern where farmers(70%) have unless 1 ha of crop land. It is a very big issue.

Imbaraga knows the problems and have to deal with MINAGRI through workshops where they discuss all.

CIP provides seeds and fertilizers to farmers and encourage farmers in using of good seeds and fertilizers, unfortunately 2,5% of farmers only use improved seeds. Imbaraga has a partnership with CIP and in some districts, Imbaraga is a service provider.

JP: soil control issue?

JM: the soil erosion is a big issue, and it's urgent to take appropriate solutions, like agro forestry, mulching, terracing...Agro forestry is useful for soil conservation and for zero grazing programme.

He recommended some specific measures for more soil conservation:

- Supporting agro forestry
- Water harvesting (for drinking water, irrigation, for animals)
- Mixed crops and inter cropping

JP: demographic growth issue

JM: the demographic growth is a big issue, and developers should integrate this issue in all developments programmes as a cross cutting issue. The dissemination of vocational training centres would help youth in solving some of their problems and in job creation.

The HIMO approach is also good in the weath creation in rural area.

Cyeru sector (Bulera District) 30/11/2011

Notes on consultation field visit Cyeru sector (Bulera District), , 30/11/2011, 15h-17h

Name	Position	Organisation	Telephone	e-mail
Musana Bernard (MB)	Director	NRM/RAB Northern Province		
Gakuba, Dr Alexis (AG)	Local Expert	SAFEGE Consortium	Mob: +250 788 540 725	agakuba@hotmail.com
Madeleine usabyimbabazi (MU)	Professional in charge of mainstream	MINAGRI	Mob: +250 788 879101	
John Pratt (JP)				
Joseph Zaraduhaye (JZ)	Vice mayor in charge of economic affairs	Bulera District	Mob: +250 788570174	Zaradjose@yahoo.fr
Ngomampire Raphael RN)	Cell executive secretary	Rugali cell	Mob: +250 788605122	
Turambe Livingstone (LT)	Socio development officer	Butare cell	Mob: +250 788440899	
Mbatezimana Anastase (AM)	Agriculture officer	Cyeru sector	Mob: +250 788440887	mbatezanastase@yahoo.fr

AG briefly talked about the objectives of the SEA study. The purpose of the SEA consultants team is to learn from local entities how environment is integrated in Agriculture sector.

JP: asked to the agronomist the time spent on agriculture activities, environment, cooperatives, infrastructure, land...

LT: for him agriculture and environment are the main activities and take 3 days per week. The 3 days are not enough because there are many is issues in those sectors. Each week there is umuganda (community works), and it helps in soil erosion control and in building infrastructure, for example schools (12 years basic education)

JP: Which priorities ,critical issues farmers have?

LT: the problem of crop production (diseases, seeds, warrantage)

AM: agro forestry is useful for soil conservation and livestock but tree nurseries are not enough.

JP: Why farmers don't like pennissetum on terraces?

AM: farmers prefer calliandra, leuceana and alnus because they are useful for livestock, wood fuel, for support for climbing beans...

Concerning funding allocation by MINAGRI at sector level, the agronomist said that tender is at district level. At sector and cell level, they prioritise needs and district analyses and tender for service providers.

JP: how is implemented soil erosion control?

AM: the sector has a budget (600,000 Rwf) for covering some costs, and some activities are implememented during community works.

CPPA Kisaro, Brother Cyrille, 1/12/2011

Notes on consultation CPPA Kisaro, Brother Cyrille, 1/12/2011, 15.30-16.45

Name	Position	Organisation	Telephone	e-mail
Musana Bernard (MB)	Director	NRM/RAB Northern Province		
Gakuba, Dr Alexis (AG)	Local Expert	SAFEGE Consortium	Mob: +250 788 540 725	agakuba@hotmail.com
Madeleine usabyimbabazi (MU)	Professional in charge of mainstream	MINAGRI	Mob: +250 788 879101	
Brother Cyrille Jules Wim (BC)	Managing Director	CPPA Kisaro		
Mukanyamibwa Mélanie	agronomist	CPPA Kisaro	Mob: +250 0783108125	

AG briefly talked about the objectives of the SEA study. The purpose of the SEA consultants team is to learn from Kisaro CPPA (Centre de perfecfectionnement et de développement agricole- Training Centre for agriculture promotion) is integrated in Agriculture. AG said Kisaro is a champion in radical terraces and he should like to know the secret of brother Cyrille.

BC: CPPA started in 1973 with radical terraces on a surface of 45 ha (crop land) and 7 ha (forest land). The crop intensification needs soil science, so before applying organic and inorganic fertilizers, the sample of soil is sent to Catholic University of Louvail and after test results, agronomist determine what to do. They import separately N, P, K, Mg and they mix if necessary. The organic manure used comes from CPPA pork farm. In some cases, after tests, they notice that humus rate is high. So the soil needs only K and P. The altitude of Kisaro is 2 300 m, the crops developed are: Irish potatoes, wheat, maize, beans, sorghum and vegetable.

The yield is 50 t/ha for Irish potatoes, 4t/ha for maize.

BC didn't recommend agro forestry, it would be good to have a landfarm and a forest farm.

CPPA provides seeds for RAB and disseminates pork in the country.

The radical terraces of Kisaro are on granit bed rock, so they are more stable than terraces developed on schist rocks.

Rural Feeder Roads MININFRA-RTDA 12/12/2011

Informal Note (SAFEGE) of Rural Feeder Roads Formulation team (Atkins/ COWI) meeting at EUD for preliminary briefing of and consultation with MININFRA and RTDA on proposed Presentation (scheduled for 13/12/2011) on 12/12/2011 from 12:00 to 13:10

Name	Position	Organisation	Telephone	e-mail
Rwakunda, Christian	DG – Policy and Planning Coordination	MININFRA	+250 252 585 755 Mob: +250 788 306 635	christian.rwakunda@mininfra.gov.rw chrisrwakunda@hotmail.com
Twagira, Dr. Elias	DG	RTDA	+250 785 656 928	etwagira@gmail.com
Rwambura, Elysee	Head of Road Maintenance Division	RTDA	+250 785 180 975	elyrwa@yahoo.co.uk relysee@gmail.com
King Boen Tan, Dr (KT)	Team Leader - Economist	Atkins/ COWI: Sector Budget Support: Rural Feeder Roads - Formulation Study	+31 623749304 Mob: +31 646661052	kingboentan@yahoo.com
Duraisaminathan, Dr. Visvanathan	Intl. Rural Roads Engineer	Atkins / COWI		V.Duraisaminathan@atkinsglobal.com
Cadilla-Falco, Jordi (JCF)	Attaché, Infrastructure	EU Delegation (EUD)	+250 252 585738/39/40/41 Mob: +250	jordi.cadilla-falco@eeas.europa.eu
Pratt, John (JP)	Team Leader	SAFEGE Consortium	Mob: +250 786 039 886	consultjohnp@btinternet.com

Based on previous consensus reached by the SAFEGE team JP explained that Dr Alexis Gakuba (AG) would attend the full meeting scheduled for 13/12/11.

The Atkins team presented a summary of proposals based on the circulated documentation. There was no discussion of their proposals for: additional (TA programme funded) Rural Feeder Roads Engineer human resources at District Level (7 Districts) and for various capacity building measures which might be linked with Workforce Development Agency and/or TEVET Centres.

The team's global estimates for feeder road rehabilitation budgets were questioned by RTDA (too low) and it was agreed there would be further immediate dialogue with RTDA on the matter; the difference seemed to be mostly concerned with assumptions of road width. RTDA was not persuaded that 4 metres general carriageway width advocated by the team would be the general optimum maximum carriageway width.

JP asserted that the SEA Report would, at least:

> ***A. Recommend permanent establishment of the post of Lands and Infrastructure Officer at Sector level to enable dedicated (50%) effort on infrastructure matters and to relieve the Sector Agronomist from such a burden and so give him/her more time flexibility to be spent on agriculture and environment matters; MTEF recurrent budget revision permitting.***
>
> ***B. State that: the EMP component of EIAs is not functioning adequately in the agriculture sector and this includes roads EMPs; and REMA needs to be reinforced to apply the rules and to make contractors/operators submit EMP reports on a regular basis.***
>
> ***C. Refer to the challenges that would arise with a significant change of width/footprint of existing feeder roads if there were a policy to raise carriage width from 3 – 4 metres (typical) up to 6 m continuous, including needs to:***
>
> ***Prepare a completely new road design profile***
>
> ***Redefine the safe buffer zone (forestry, etc)***

Redraw and re-survey/register private property boundaries

Recalculate environmental impacts, e.g. more run-off; more murram road fill/km.

This remark was prompted by notions from RTDA of possibly proposing a policy for a minimum feeder road carriageway width of 6 m, although the Atkins team was advocating maximisation of roads length/SPSP-SBS (with 10% passing bays) with a carriageway of 3 – 4 m width maximum.

JP explained that AG would be able to answer further questions if required and that the SAFEGE team's final recommendations in respect of Rural Feeder Roads would be incorporated into the draft SEA Report due on 21/12/11, i.e. one week after the conclusion of the feed roads formulation mission.

The following matters espoused by the SAFEGE team were not presented by JP but were separately discussed with the Atkins/ COWI team:

D. Need for Formulation to explicitly require inclusion of Environmental Assessment/Monitoring capacity in the Engineering Supervision specification and the respective services contract for every road rehabilitation or maintenance contract (AG to advise further);

E. Each EIA to include a standard (refer previous work) Environmental Screening Checklist to be completed by the Operator/contractor and to be checked and verified + endorsed by the Supervising Engineer (i.e. the Environmental arm of the Engineer); and

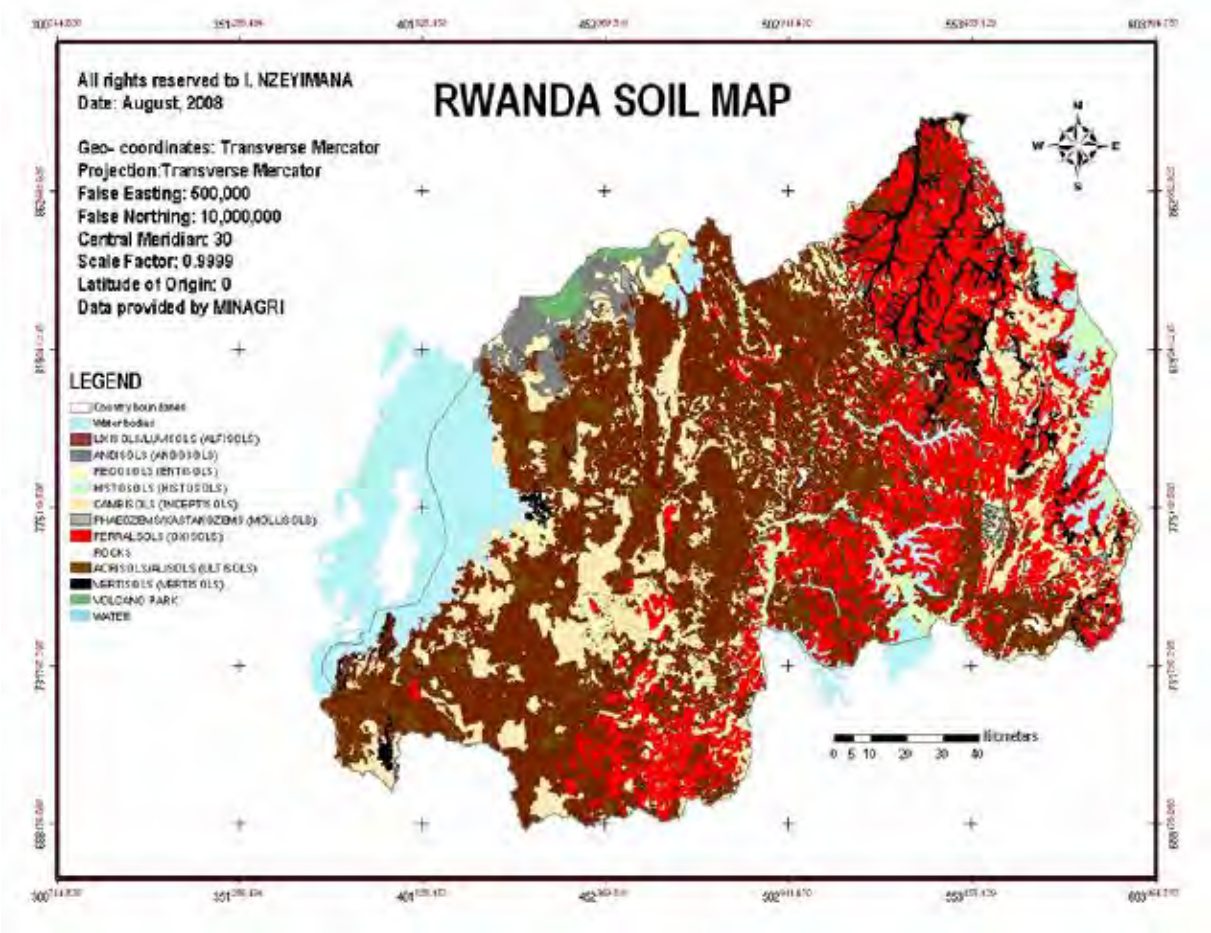
F. Need for National Rural Feeder Road Standards (they are yet to be decided) to included specific criteria and guidance for establishment of protective vegetation on embankments and cuttings and in Buffer Zones, according to soil type, soil depth, rainfall pattern, species and other prescriptive attributes required for environmental sustainability – based on professional guidance and best practices that may be adopted from elsewhere, possibly such as Ethiopia .

Item E. could be made available to the Atkins/ COWI team by AG.

AG would offer any other related advice at the general Presentation on 13/12/11.

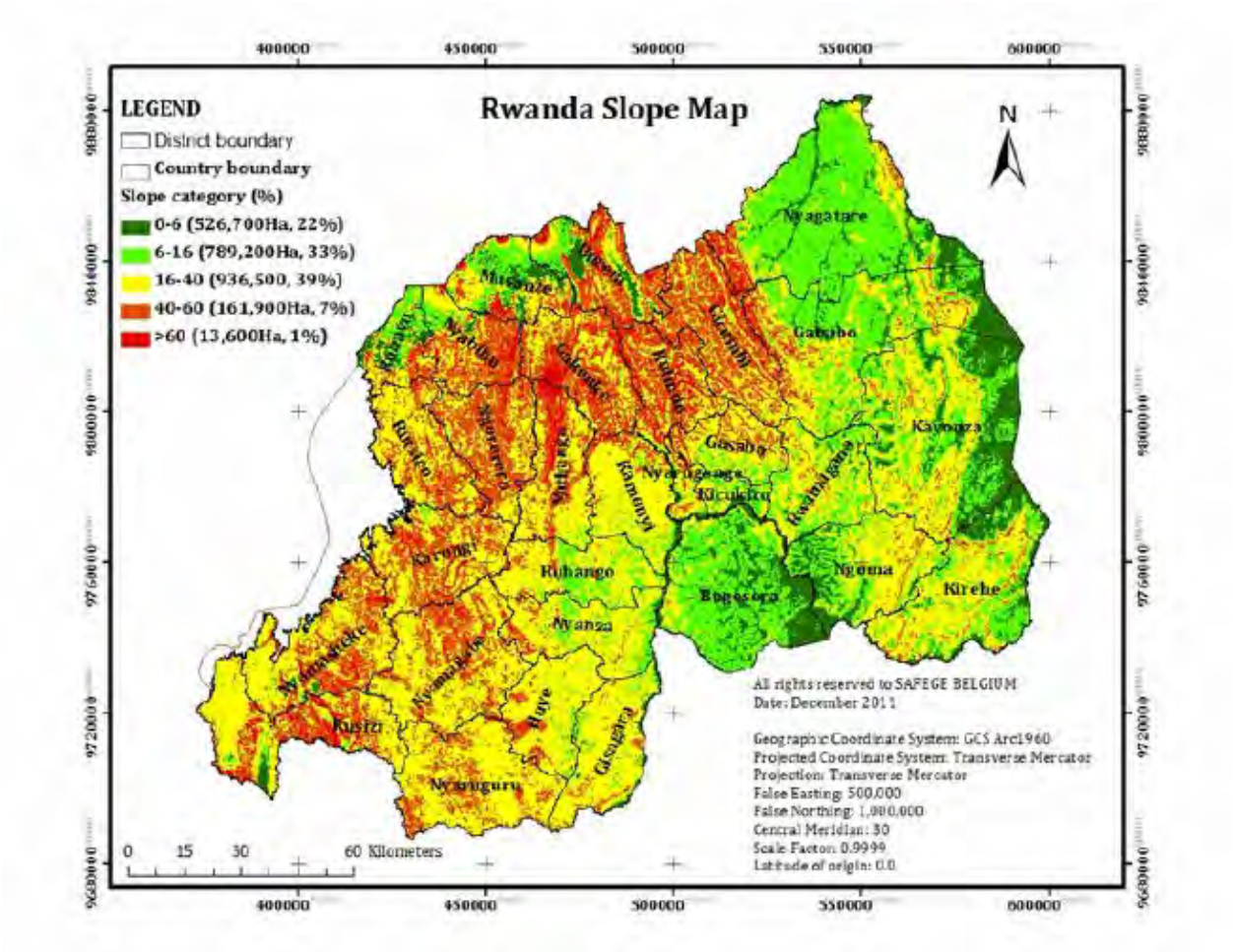
Annex D6: Spatial Data: Geographical and Environmental Mapping

National Soil Map

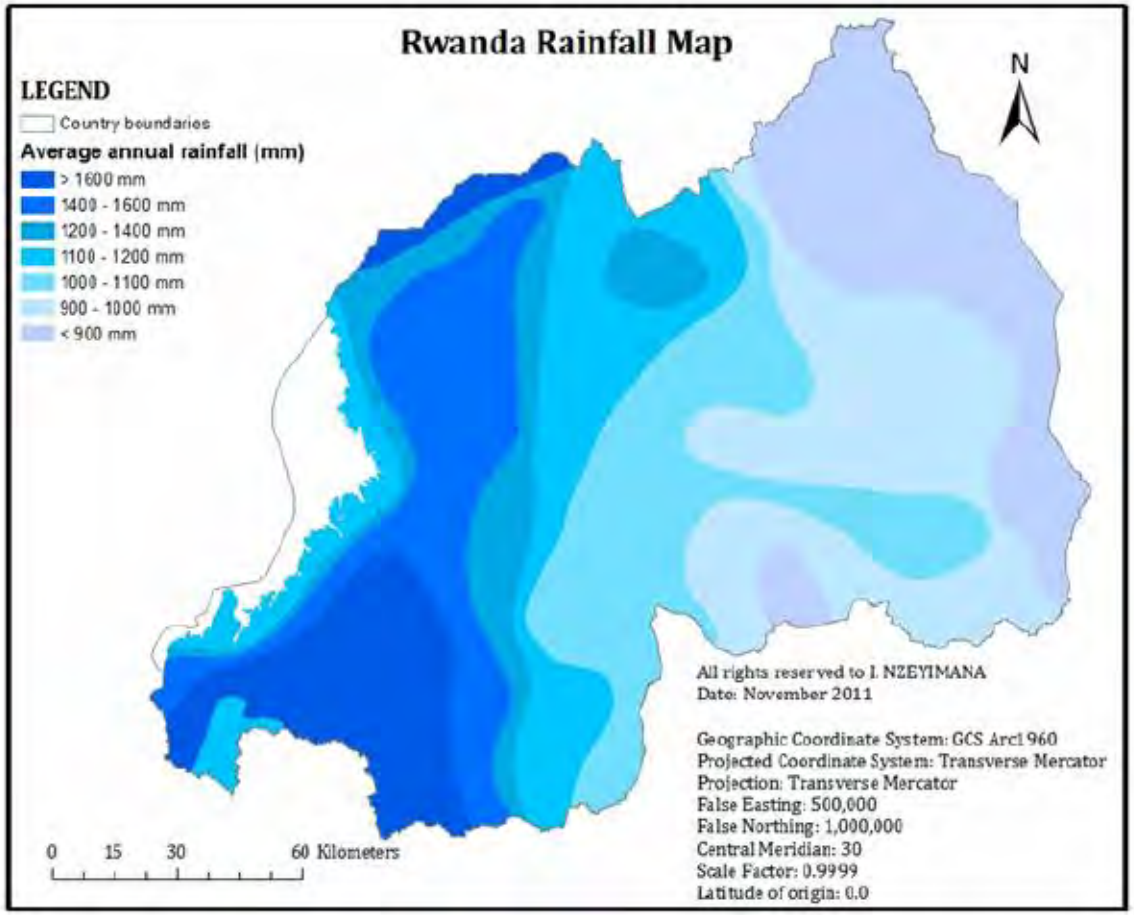


Slope categorisation and quantification for Rwanda

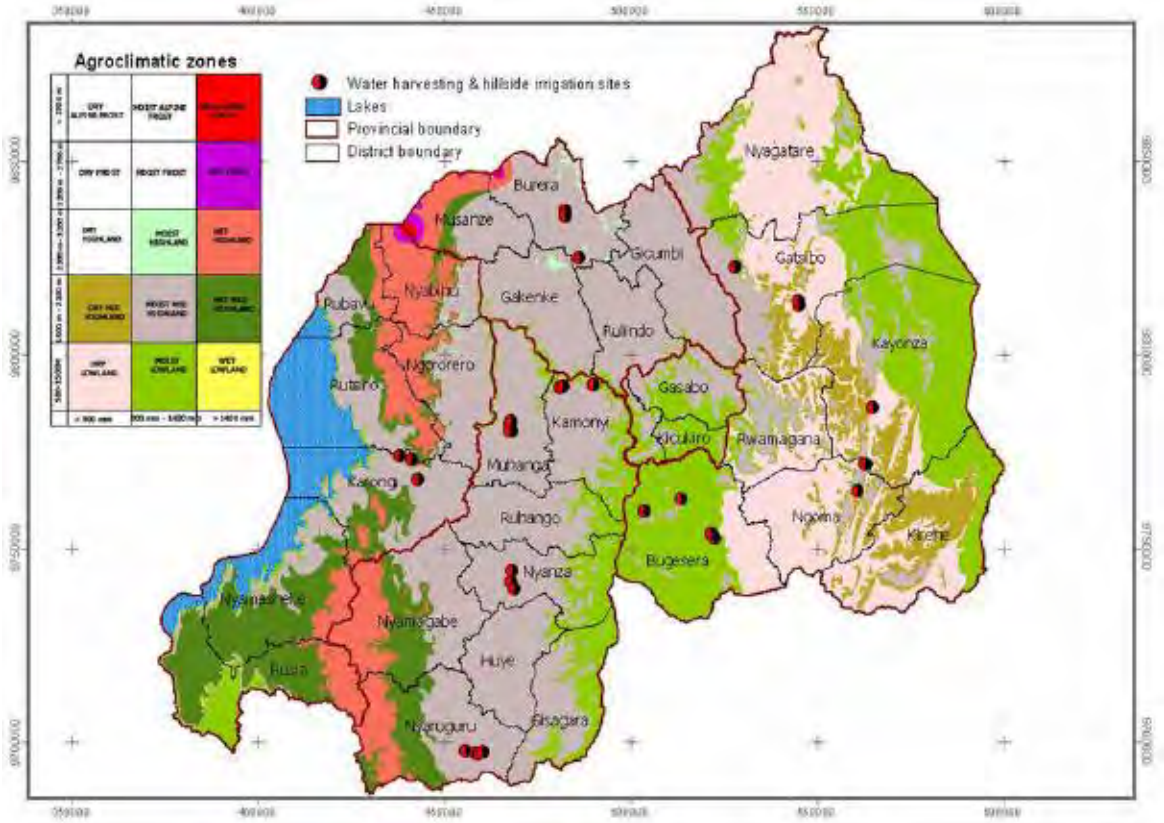
2,428,000 ha gross *excluding Lake Kivu* - ***Slopes exceeding 16% are 1,112,000 ha (46%); exceeding 40% are 175,000 ha (7%)***



Rainfall Map



Agro-climatic Zones Map



NUR Study: Slope and soil depth aptitude for cultivation and need for protection

Extracts from Final Study by National University of Rwanda Consultancy Bureau. Section B.

MINAGRI, 2010: Gishwati Water and Land Management Project. Ministry of Agriculture and Animal resources. Kigali.

1. … An important outcome of the study is the composite effect of the soil depth when it is superimposed with the different slope categories….. This has alerted us on the sensitivity of the different land units to the technologies we recommend.

2. Based on the soil depth and the slope class map analysis, twenty (20) land sensitivity level /resilient categories were identified. These categories were then used as land units for land-husbandry interventions. The composite effect of the slope and the soil depth in identification of these Units was made using ArcGIS spatial tools analysis. The land resistivity units (sensitivity level to land use) were identified and considered for the specific land and water management technologies.

3. The combinations of soil type, depth and slope class categories yields land units that were ranked from 1 to 20 by land use/management sensitivity classes as in the following table. The colors (*from green – rank 1 to red – rank 20*) are used to show the land units that present low or high risk to erosion and landslide threats, respectively. Therefore, this requires different land management technologies to different land sensitivity units.

Table: ***Land Units of different management and land use regimes***

	Land units (ha) by slope category and soil depth				
Soil depth	0 -6%	6 - 16%	16 - 40%	40 - 60%	>60%
Rock	(16)	(17)	(18)	(19)	(20)
0 - 50cm	(7)	(8)	(11)	(12)	(15)
50 - 100cm	(2)	(4)	(6)	(10)	(14)
100 - 200cm	(1)	(3)	(5)	(9)	(13)

4. The land units 1 and 2 will directly be used for minor agriculture intervention with graded soil bunds combined with grasses strips. The land units 3 to 6 will be used for graded bench terraces with agroforestry species. The graded bench terraces with grasses and shrubs will be applied on the lands units 8 & 11.

5. The land units 9 & 10 will be used for progressive terraces with pasture grass (Kikuyu grass), fruit trees or tea plantation. The land units 13, 14 & 15 will be used for forest plantation & fruit trees (excluded zone for agriculture). The Land units 16, 17, 18, 19 & 20 are excluded zones for agriculture (rock).

Annex D7: Terms of Reference

Strategic Environmental Assessment of the Agriculture sector in Rwanda

Terms of Reference

1. BACKGROUND

The European Union, represented by the European Commission, requires a Strategic Environmental Assessment (SEA) to be carried out in order to provide support and environmental guidance on the Mid-Term Review (MTR) extension of its Sector Budget Support (SBS) for Decentralised Agriculture (10th European Development Fund [EDF] 2009/021572) and the preparation of the 10th EDF (MTR) Sector Policy Support Programme (SPSP) for Rural Feeder Roads. The SEA, at the same time, shall inform the environmental and sustainability aspects of the planning processes in course for the preparation of the upcoming Strategic Plan for the Transformation of Agriculture (SPTA) Nr. 3 and the Economic Development and Poverty Reduction Strategy (EDPRS) 2013 - 2017 of the Government of Rwanda (GoR).

The specific objective of the extension of the SBS for Decentralised Agriculture is to support the implementation of SPTA (Strategic Programme for the Transformation of Agriculture)-II and SPTA-III, giving special emphasis to the aspects of food security, nutrition and environmental sustainability. In addition, the topping-up is meant to contribute to the implementation of the Ministry of Agriculture and Animal Resources (MINAGRI)'s National Post-Harvest Staple Crop Strategy, MINAGRI's contribution to the implementation of the National Multi-sectoral Strategy to Eliminate Malnutrition in Rwanda, and to reinforce the institutional framework and capacities for fiscal decentralization in the agricultural sector.

The specific objectives of the SPSP for Rural Feeder Roads are: (a) to enhance the access to markets (especially in areas with high agricultural potential) and to basic economic and social services, through the improvement of the rural road network; (b) to improve consumer access to safe and affordable food, thereby strengthening food security among rural populations; and (c) to improve the implementation of rural transport policies at local level, by helping set up a sustainable system and reinforcing the capacities of local governments in the domain.

The major policies, strategic plans, programmes and guideline documents to be considered are:

- Rwanda Vision 2020. GoR (Government of the Republic of Rwanda). 2000.
- Constitution of the Government of the Republic of Rwanda. May 26, 2003.
- Economic Development & Poverty Reduction Strategy 2008-2012. The Republic of Rwanda. September 2007.
- Strategic Plan for the Transformation of Agriculture in Rwanda (SPTA), Phase II (2008-2012).
- Sector Budget Support for Decentralized Agriculture (EDF/2009/021572). Financing Agreement, Technical and Administrative Provisions, Action Fiche.
- Sector Budget Support for Decentralized Agriculture (10th EDF MTR)– Phase II, Draft Rider to Financing Agreement, Draft Action Fiche.
- Sector Policy Support Programme for Rural Feeder Roads (10th EDF MTR) - Identification Fiche.
- Five-Year Strategic Plan for the Environment and Natural Resources Sector (2009-13), Ministry of Natural Resources (MINIRENA), June 2009.
- Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the effects of certain plans and programmes on the environment, June 2001.

- Environmental Integration Handbook for EC Development Co-operation. European Commission, 2007.
- Guidelines on the Integration of Environment and Climate Change in Development Cooperation, EuropeAid, November 2009.
- Environmental Profile Rwanda, European Commission / Rep. of Rwanda, Kigali, July 2006.
- Rwanda State of Environment and Outlook, REMA, 2009.
- General Guidelines and Procedures for Strategic Environmental Assessment (SEA), REMA, June 2011.
- General Guidelines and Procedures for Environmental Impact Assessment (EIA), REMA, November 2006.

The key stakeholders for the SEA are:

MINAGRI is mandated to develop, transform and modernise the Rwandan agriculture in general (including fishing and livestock) in a sustainable way and is the lead ministry for both aforementioned Sector Budget Support Programmes and the implementation of the sector-wide Strategic Plan for the Transformation of Agriculture (SPTA-II 2009-2012, and SPTA-III 2013-2017).

The Ministry of Infrastructure (MININFRA) is in charge of public infrastructures (buildings, roads, etc.), energy, transport and communication. MININFRA has recently established a Section for District Support on Road Infrastructure within the Planning Department, which shall be closely involved along the SEA process.

MINIRENA's mandate includes the preparation, follow up, and evaluation of environmental policies and strategies, norms and practices; the promotion of sustainable resource use; incentive measures and support programmes to private sector and civil society so as to invest in land protection activities, water resources and environmental protection; the coordination of stakeholders activities and the capacity building of centralised entities in matters of land management, water resources and environment.

The Ministry of Local Government (MINALOC) is in charge of the elaboration, follow-up and evaluation of national policies and programs regarding decentralisation. MINALOC is responsible for putting in place decentralised administrative structures, able to mobilise the population in order to implement Government programs. It is also responsible for ensuring collaboration and complementarity between Government institutions in their support to decentralised administrative units, strengthening decentralised administrative units.

The Rwanda Environment Management Authority (REMA) is required by law to oversee environmental assessment requirements in policies, plans, and development programmes and to advise the GoR on policies, strategies, and legislation related to the management of the environment. Under this mandate, REMA develops facilitative and legal instruments in the form of guidelines and regulations for implementing its oversight functions. Environmental assessment guidelines for Rwanda, including general guidelines for EIA and several sector-specific EIA guidelines as well as for Environmental Auditing have been developed and mainstreamed. SEA guidelines have been developed within this regulatory framework. The legal responsibility for conducting SEA of Policies Plans and Programmes (PPPs) lies with the lead agency, while REMA provides the necessary oversight.

REMA with the support of the Poverty Environment Initiative Project (PEI) has identified sectors, including Agriculture, for which specific guidelines have been developed to integrate environmental sustainability in the budget call circular (BCC). The overall plan is to ensure that the sector planning and implementation lead to optimum performance and productivity through resource allocation to

support environmental sustainability. Additionally, PEI has supported an intern, strategically positioned in the planning department of MINAGRI to ensure sufficient on ground support for sector engagement around environmental mainstreaming.

Rwanda Natural Resources Authority (RNRA), specially the Lands and Mapping Department, will be consulted during the SEA as some of its main responsibilities are to prepare, publish and update all or parts of different maps of Rwanda including land use maps, to define standards for spatial information and land information data collection; and to be a customer point and provider for various digital and hard maps and digital data purchase. The information available from RNRA, as well as consultations with its authorities and technicians, would be fundamental for the achievement of a high quality SEA.

It is common practice for international development finance organizations to require SEA for large development strategies and programmes. Rwanda's Ministry of Finance and Economic Affairs (MINECOFIN) requires sectors to demonstrate environmental sustainability in their mandated activities before operational budgets can be allocated. A funding mechanism for SEA (just as already established for EIA in Rwanda) may be considered in the near future.

With the recent administrative reforms, districts have been entrusted with new powers in terms of environment management. The legal framework (Law 04/2005) at Local levels of the Administration provides for experts and Committees in charge of environment protection and natural resources conservation.

The involvement of various Non-State Actors (NSAs), higher learning and research institutions in environment management in Rwanda will be important along the scoping and SEA study process.

The Constitution of 2003, and the Organic Law that gives it effect, provide all persons with the fundamental right to live in a healthy environment and stipulate their obligation to contribute individually or collectively to the conservation of the natural heritage and of historical and socio-cultural activities. The law further provides the Rwandan people with the rights to free access to sufficient information about the environment and to time for expressing their views on the environment, and also provides for public representation in decision making on environmental issues and to training, sensitization, and access to findings of research on the environment.

<u>The legal background for the SEA can be summarized as follows:</u>

Principle 1 of Article 7 in Rwanda's Organic Law 04/2005 stipulates precautionary measures that are informed by the results of both environmental assessment of policies, plans, projects, and development activities and assessment of social well-being. However, although the legal provision for the deployment of an SEA instrument appears to be present, only EIA is adequately treated in the law and in the general and sector-specific guidelines issued by REMA. REMA envisages the conduct and mainstreaming of SEA to proceed along the lines of the EIA regulations as articulated in Guideline 3 (REMA 2006), in which REMA would develop screening criteria to determine which PPPs require SEA and which are exempt, and propose them as a basis for a legal instrument in form or a order of Minister in compliance with Article 67 of the Organic Law.

The SEA Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programmes on the Environment applies to a wide range of public plans and programmes (e.g. on land use, transport, energy, waste, agriculture, etc). The SEA Directive, in force since 2001, does not refer to policies. Plans and programmes in the sense of the SEA Directive must be prepared or adopted by an authority (at national, regional or local level) and be required by legislative, regulatory or administrative provisions. An SEA is mandatory for plans/programmes which (i) are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use, and which set the framework for future development consent of projects listed in the EIA Directive; or (ii) have been determined to require an assessment under the Habitats Directive.

Environment and SEA within the context of Sector Policy Support Programmes

SEA determines whether the Sector Programme is consistent with the country's and EU's environmental policy objectives, and if the environmental impacts of Sector Programme implementation are likely to be significant. On the basis of this analysis it provides feedback to the Government to enhance the environmental dimension of the Sector Programme, and also enables improved integration of the environment into SPSP formulation. In the context of EU development co-operation, SEA can take the form of an EU-driven process to provide an input into the formulation of the SPSP. Only sector programmes with potential significant impacts on the environment when implemented will require an SEA, as determined through an SEA Screening process.

2. DESCRIPTION OF THE ASSIGNMENT

2.1 GLOBAL OBJECTIVE

Ensure that environmental concerns are appropriately integrated in all sector (agriculture) and sub-sector (rural feeder roads) decision-making, implementation and monitoring processes. It is anticipated that the findings of the SEA may influence policy development in the agriculture sector and the rural feeder roads sub-sector.

2.2 SPECIFIC OBJECTIVES

Describe, identify and assess the likely significant effects on the environment of implementing the agriculture policies from MINAGRI, the SBS for Decentralised Agriculture and SPSP for Rural Feeder Roads, to be taken into account in the review of the performance, Monitoring and Evaluation (M&E) framework and focus of the SBS for Decentralised Agriculture, and on the preparation of the SPSP Rural Feeder Roads, respectively.

Provide decision-makers of GoR, the EU and other Development Partners (DPs) in Rwanda with relevant information to assess the adequacy of environmental considerations when supporting the implementation of the Strategic Plan for the Transformation of Agriculture (SPTA). This information should help ensure that environmental concerns are appropriately integrated in the decision-making processes at the stages of programming, planning and implementation.

Assess the degree to which the planned Sector Budget Support programmes address the major environmental sustainability challenges in the agricultural sector and provide recommendations at strategic level on how potential negative effects can be minimized and how positive effects can be optimized. Particular focus will be given to the adequacy of institutional structures and capacities at the national and local level, as well as of the regulatory framework, to address key environmental concerns associated to the agricultural sector.

2.3 REQUESTED SERVICES

2.3.1. Scoping study

a. Overview of the sector programme and its institutional and legislative framework

The consultants must describe, to the extent possible and liaising with other appraisals existing or being developed, both sector programmes under assessment. A description must be made of the sector programme's institutional and legislative framework, including the institutions responsible for the implementation of the sector programme, for the management of its environmental impacts and for the SEA process, as well as the relevant environmental policy and legislation.

The specific decisions and processes which should be influenced by the SEA must be identified, especially aspects for the formulation (Action Fiche, Financing Agreement) of the SBS for Rural Feeder Roads, the performance assessment of the SBS for Decentralised Agriculture, and the preparation of SPTA-III and M&E framework for the agriculture sector.

An overview must also be given of the wider policy framework related to the sector programmes, in order to identify other planning or policy documents which will need to be explored in the SEA study. Other policy-making and planning processes which could be influenced by the SEA must be identified, including (but differentiating) those within the GoR and those within the EU (e.g. programming for the 11th EDF).

Consideration should be made of relevant environmental commitments, if any, under multi-lateral environmental agreements (MEAs). It is recommended that the Consultants also examine recent EIAs related to the agricultural sector and the rural roads subsector in Rwanda, in order to familiarise themselves with current field issues.

b. Description of key stakeholders and their concerns

The involvement and active participation of stakeholders in the whole SEA process is a key success factor. The consultant should identify key stakeholders (key groups and institutions, environmental agencies, NGOs, representatives of the public and others, including those groups potentially affected by the likely environmental impacts of implementing the sector programmes).

The Consultant's proposed list of stakeholders to be engaged should be based on a stakeholder analysis.

Consultants must review records of any national public consultation processes that may have taken place as part of the sector programme preparation process. Based on this review and on additional consultations, they should identify key stakeholders' concerns and values with respect to the sector programme under consideration. The stakeholder engagement strategy to be employed has to be agreed with the EU Delegation and MINAGRI before being implemented, in order to avoid unnecessary conflicts or raising of expectations. The strategy should provide stakeholders an opportunity to influence decisions. If the public is not used to being engaged, particularly at the strategic level, and if there are no precedents, it would be important to include an education component in the stakeholder engagement process. This could be done by e.g. actively promoting participation; emphasizing, at the start of participatory processes (e.g. workshops) the importance and value of public participation; and actively seeking involvement of key stakeholders that were absent in previous participatory forums.

The Consultant must keep records of all consultations held and comments received. The outcome of these consultations will have important implications for the direction and focus of the SEA study. Consequently, a structured analysis of the available material will be needed to determine the key conclusions and areas of concern. Consultations may include a mix of different participatory methods, including questionnaires, focused semi-structured interviews and workshops. The consultants will have to ensure wide participation, but at the same time consider the possibility of participation 'fatigue'. The willingness of key stakeholders to participate in workshops and interviews in repeated occasions should be taken into account, and preference should be given to less, but more focused and strategically planned workshops in key stages of the process, than repeated workshops.

c. Description of key environmental aspects to be addressed in the SEA

On the basis of the policy, institutional and legislative framework analysis, as well as the participation of stakeholders, the consultants must identify the key environmental aspects in the agricultural sector and feeder-roads sub-sector that should be addressed in the SEA study. That is, the key sector interactions of both Sector Budget Support Programmes with the environment which need to be given

special consideration and emphasis. Depending on the expected impacts on society and the scope of other studies, there is also a need to determine to which extent social impacts should be assessed[1].

Specific aspects to be explored include (non-exhaustive list):

Agriculture sector / SBS Decentralised Agriculture

- Sustainable Agriculture included as a priority issue in national-level policies and strategies;
- Legislation and regulations that require Environmental Impact Assessment of agricultural projects;
- Policies for the conservation and promotion of agro-biodiversity;
- Policies that stimulate the integrated use of resources at local level;
- Land registration processes and their (expected) impact on the sustainability of agricultural land use;
- Environmental impact of land distribution and/or socio-economic stress of households and communities;
- National framework, strategy and initiatives for Integrated Pest Management (IPM);
- State and trends of pest management and pesticide use (insecticides, fungicides, herbicides) in agriculture;
- Approved pesticides;
- Standards and regulations for the use and handling of pesticides;
- Area under Integrated Pest Management (including organic production);
- State and trends of fertilizer use;
- Ammonia pollution from manure and nitrogen use;
- Pollution of water resources (both surface and underground water resources) by agriculture;
- Loss of fertility in agricultural soils (organic matter, acidification…);
- Integration of ecosystem-based approaches in the agriculture sector and potential positive contributions from agriculture to the provision of essential ecosystem services (soil fertility, water resources, etc.)
- Existence of a “polluters pay principle” that is applicable to farmers;
- Impact of irrigation projects on the water table, water-logging and wetlands (to consider the Rwanda Irrigation Master plan developed by MINAGRI);
- Environmental sustainability of marshland development and hill irrigation approaches;
- Extent and rates of soil erosion versus scope of soil protection measures;
- Impact of agricultural subsidies, if any, on the promotion of good agricultural practices;
- Support to farmers wishing to change to more environmentally-sustainable methods;
- Incentives for sustainable investments (e.g. agro-forestry) for on-farm employment in rural areas;
- Impact of population growth on the sustainability of agricultural production systems;

[1] In this case, impacts on humans should be disaggregated according to sex, age, or other relevant social criteria.

- Trends of changes in farming systems;
- Impact of commodity-oriented production;
- Monitoring/accounting systems of natural resources;
- Mechanisms to measure agro-environmental impacts (soil erosion, use of water quality, deletion of agro-biodiversity);
- Dialogue and coordination mechanisms for environmental cross-sector interventions;
- Environmental awareness raising in respect of agriculture;
- Links between higher education, research and extension, training and dissemination of information in the agricultural sector;
- Potential for climate change Clean-Development-Mechanism (CDM) investments in Rwanda's agriculture sector (e.g. agroforestry);
- Linkages and synergies with the National Adaptation Plan for climate change and possible other climate related strategies.

SPSP Rural Feeder Roads

- Guidelines for environment-friendly design of feeder roads;
- Loss of vegetation coverage because of land clearing;
- Erosion and landslides because of possible blasting;
- Land degradation caused by borrow pits;
- Environmental impacts related to disposal of excess soil, placement of construction sites and storage of construction materials;
- Available engineering techniques / Bio-engineering techniques for slope stabilization;
- Appropriate requirements for contractors (e.g. environmental management and mitigation plan for sites).
- Potential impacts on the health of the population (short-term and long-term).

d. Description of the scope of the environmental baseline to be prepared in the SEA study

On basis of the information obtained above, the Consultants must provide indications on the scope of the environmental baseline needed for the SEA study. This will include a proposal of the geographical units that will need to be addressed. All geographical units identified should be justified.

The environmental baseline must provide a general description of the state of the environment and a more detailed description of the key issues identified in the previous step. Impacts on humans should be disaggregated according to sex, age, or other relevant social criteria. This process will require careful consideration to ensure adequate geographic and thematic sampling, while remaining practical, relevant and adequate within the available budget and timeframe.

In an overall sense the baseline should contribute effectively to assess: at what scale, where, how and why both Sector Budget Support Programmes will generate, or be subject to, positive and/or negative environmental impacts; as well as determining the magnitude and sensitivity of those impacts at a level of confidence that can be used in policy and management decisions.

The information and data needed to complete the environmental baseline (including associated pressures and trends) must be identified, giving an indication of the likely sources where this

information/data may be obtained. As well, information/data which is likely to be difficult to obtain, either because it may never have been generated or access may be difficult, should be pointed out.

The proposed scope of the baseline study should consider the principles of effective budgeting and cost-effectiveness respectively.

e. Recommendations on specific impact identification and evaluation methodologies to be used in the SEA study as well as for stakeholder engagement

Methodologies proposed should be drawn from best international practice, but be compatible with those used by REMA and should be rigorous enough to ensure an adequate assessment and a sector-targeted analysis of issues at a strategic level.

Any particular mechanisms proposed for stakeholder engagement which may be a deviation from the initially agreed stakeholder engagement strategy should be described.

f. Indication of the timeframe, costs and resources needed to carry out the SEA study

The Consultants must assess the time needed to be allowed for the completion of the SEA study. A description and estimation of the resources required (in terms of budget, person-days) must be provided, including a breakdown of costs.

The Team Leader, in coordination with the rest of the team, may review and adapt the initial timing and expertise to complete the SEA study, and develop a schedule of resources needed, including:

- person-days of technical input for each of the experts;
- operational support costs, including participatory processes and special technical inputs (workshops, group participation training);
- any special mapping or data collection costs; and
- the Consultant's team operating costs (out-of-town transport, accommodation, etc.)

The financial impact of the proposed review shall be limited to a transfer within the fees, or between the fees and reimbursables, involving a variation of less than 15% of the original amount of each of the budget lines, not increasing the total amount of the contract. In that case, the changes will be accepted by the Contracting Authority in writing (administrative order) and do not require an addendum to the contract.

The resource costs will be presented in a budget format broken down into appropriate line items. The Consultant shall be responsible for all expenses for accommodation, office equipment, hard- and software, printing, binding, communication, secretariat, meeting rooms and any incidentals. These costs are deemed to be included in the fee rates of the experts. Exception will be made for the presentation of reports and opinions to stakeholders, for which a meeting room will be provided.

2.3.2. SEA study

The scope of the SEA study will be agreed with the EU Delegation and MINAGRI on the basis of the results of the scoping study. The SEA study will include performance assessment and recommendations for the enhancement of the agriculture sector's environmental sustainability and performance in general as well as, for both Sector Budget Support Programmes: an environmental baseline study, an identification of environmental opportunities and constraints, an identification and assessment of the potential environmental impacts, an analysis of performance indicators, an

assessment of the institutional capacities to address environmental challenges and conclusions and recommendations for programme formulation (SBS Rural Roads),.

a) Environmental baseline study

A description and appraisal must be made of the current state of the environment, focusing on those key environmental components identified by the scoping study. External factors must be taken into account, including the influence of other sector policies.

The geographical (or mapping) units to be addressed should be described. The assessment should be linked to geographical regions used within the Sector Budget Support programmes and their national strategic frameworks (e.g. SPTA) or commonly used census or mapping areas, so that the limits and limitations of the baseline data are adequately delineated and comparative analyses are possible.

The pressures acting on the key environmental aspects must be identified, as well as their trends, and a projection must be made of the state of the environment for the key issues on the short-, medium- and long-term.

Wherever possible, linkages should be established with the National Institute of Statistics (NISR), other national livelihood monitoring units, and the Rwanda Environment Management Authority (REMA) and the Rwanda Natural Resources Authority (RNRA), regarding environmental sensitivity maps and other data. GIS as tool for generation of baseline environmental information should be taken advantage of in the SEA study.

b) Identification and evaluation of environmental opportunities and constraints

The environmental factors and resources that can affect (positively or negatively) the effectiveness, efficiency and sustainability of the two sector programmes in question should be identified, described and assessed. These factors may include expected impacts from other sectors or policies. This part of the study should also consider the environmental issues that could potentially be addressed by the assessed programmes, and if the sector programmes provide an adequate response to these opportunities and constraints.

An analysis must be made of the degree to which the SBS programmes address these issues, i.e. addressing environmental issues that affect sector performance in a negative manner, and making optimal use of opportunities offered by the environment to enhance sector performance. A matrix approach is suggested to illustrate the findings, indicating the environmental factors and resources; the positive and negative impacts and degrees of significance; and the programme assessment variables.

c) Identification and evaluation of impacts

The potential environmental impacts and risks from implementing the sector programmes must be identified and described, taking into account the views and concerns of stakeholders. Their significance should be determined according to their characteristics (e.g. duration, probability, magnitude, mitigability, reversibility) and the sensitivity of the environment. Those impacts which are significant should be assessed in detail taking into account:

- the views and concerns of stakeholders (especially capacity of the directly concerned authorities to integrate the new infrastructural developments proposed).
- the consistency with international commitments (MEAs),
- the socio-economic consequences (especially on vulnerable groups),
- compliance with environmental regulations and standards,
- consistency with environmental objectives and policies, and
- their implications for sustainable development.

It is suggested that matrices, flow charts, etc. are used to illustrate the findings, showing which components of the SBS programmes have an effect on which environmental aspects, and the significance of such impacts, as well as for showing consistency with environmental objectives and international commitments.

d) Analysis of performance indicators

The performance indicators proposed for both sector programmes should be assessed and revised from an environmental perspective, i.e. their usefulness to identify the environmental effects (positive and negative) of sector programme implementation. Proposals should be made for both the SBS performance indicators and for the monitoring system.

The set of indicators may include:

- "pressure" indicators[2];
- "state" indicators, for sectors with a direct and major link with key environmental resources (e.g. for soil resources)[3];
- indicators of other specific issues, such as key institutional challenges identified by the SEA[4].

The set of indicators that are proposed should be practical, usable and SMART (Specific, Measurable, Achievable, Realistic and Timely). A baseline will have to be defined for them. If it is not possible to define it, the Consultant should propose clear recommendations on how it could be obtained.

The Consultant should give an indication of how recommended indicators may be applied, including: - information/data needed to apply the indicators, the sources where it may be obtained, and an indication of possible costs associated; - other resources needed to apply the indicator (e.g. specific equipment or technical capacities).

e) Assessment of the capacities to address environmental challenges

The capacity of regulatory institutions to address the environmental issues, especially the impacts identified, should be assessed. The Consultant is expected to incorporate information on the budget availability and the Mid-Term Expenditure Framework (MTEF).

The Consultant will assess the adequacy of institutional structures and capacities of the regulatory framework and human resources of the agriculture sector and the rural roads subsector and national environmental institutions, to address the key environmental concerns associated to the aforementioned sectors. As noted earlier this assessment should focus at the policy/sector level and take adequate *cognizance* of realistic present and future capacities. More information on the SEA guidelines for Rwanda (steps 8 and 9).

f) Stakeholder engagement

Stakeholders should be engaged throughout the SEA study according to the stakeholder engagement strategy agreed in the scoping stage.

[2] For example: pesticide use in a given area (e.g. Deltamethrin as pour-on for control of tse-tse); hectares of forest cleared for agriculture.

[3] For example: % of groundwater samples meeting quality standards.

[4] For example: number of annual environmental inspections carried out by local authorities in industrial facilities.

The Consultant will ensure that the sector stakeholders are fully engaged throughout the SEA study, as planned during the scoping process and as suggested in the scoping report. Stakeholder engagement could include a mix of different mechanisms, such as questionnaires, focused semi-structured interviews and workshops with key stakeholders (both in Kigali and in selected Districts, as agreed).

The main stakeholders will compose a SEA Steering Committee, which will have as main tasks the follow-up, recommendations to the Consultant for further enquiries/reports and final acceptance of documents of the different phases of the SEA. This Steering Committee will be integrated by representatives of MINAGRI, REMA and the EU, and its composition could be modified during the scoping phase.

g) Conclusions and recommendations

This chapter will summarise the key environmental issues for the sectors involved, including the different stakeholders and authorities involved. This would include policy and institutional constraints, challenges and main recommendations. Recommendations should be made on how to optimise positive impacts and the opportunities to enhance the environment, as well as on how to mitigate environmental constraints, negative effects and risks, including roles and responsibilities of sectoral institutions outside MINAGRI In view of the ongoing preparation of SPTA-III, recommendations should be drawn from an environmental assessment of SPTA-II.

They should suggest potential changes in the sector programme design (SBS Rural Feeder Roads) or implementation (SBS for Decentralised Agriculture), sector performance monitoring modalities, and indicate priority areas for cooperation between DPs and the GoR, emphasizing in particular the support to sector- and cross-sector environmental monitoring, accounting, reporting, information, communication and awareness raising systems.

Recommendations should especially be made to support the overall assessment of the sector programmes (referring to the assessment areas described in the EU guidelines for SPSP) as well as for the SPSP formulation (only SBS Rural Roads). Recommendations for the latter should be distinguished from those concerning sector programme enhancement.

The recommendations for sector programme enhancement should be addressed to the EU for incorporation in its policy dialogue with the GoR.

Recommendations to the EU Delegation for the SPSP formulation for Rural Roads must address the possibility of providing Technical Assistance or the use of other aid modalities to address specific challenges in the environmental, institutional, legal and policy frameworks, and include proposals for indicators.

Recommendations will also include a proposal for a follow-up and monitoring of the implementation of the results of the SEA study.

The consultant will pay specific attention to providing realistic, targeted and workable operational recommendations, general statements should be avoided.

The limitations of the SEA and its assumptions should be presented. The recommendations should take into account the views presented by the stakeholders and explain how these were integrated. In the case of concerns that were not integrated in the final recommendations, the reasons thereof should be given.

The findings of the SEA will be presented in a workshop to all relevant stakeholders, including media coverage.

2.4 REQUIRED OUTPUTS

The SEA is composed of two parts: a scoping study and an SEA study. The scoping study will define the issues that need to be addressed in the SEA study, considering the specific context in which the sector programme is being developed and is likely to be implemented. The activities, calendar and budget for the SEA study will be determined on the basis of the conclusions of the scoping study.

The SEA scoping study will deliver the following outputs:

- a description of the sector programme/s concerned;
- a brief description of the environmental requirements of the EU relevant to the agricultural sector;
- a brief description of the institutional and legislative framework of the agricultural sector in Rwanda;
- a brief presentation of the relevant environmental policy and objectives in the country;
- an identification of the key stakeholders and relevant authorities for the SEA and their concerns, as this is critical to ensure buy-in and ownership (see step 6 of SEA Guidelines for Rwanda);
- an identification of the key sector programme/s-environment interactions (potential environmental and environmentally-linked social impacts of its implementation, the degree to which the SBS programmes address the key environmental concerns of the agricultural sector);
- a description of the scope of the environmental baseline to be prepared during the SEA study and the main sources from which the baseline will be compiled;
- an identification of the impact identification and evaluation methodologies to be used in the SEA study;
- a description of the stakeholder engagement mechanisms proposed for the SEA study;
- an eventual proposal for reallocation of resources between different budget lines, not affecting to the total cost of the study.

The SEA study will deliver the following outputs:

- an environmental assessment of the SBS programme for Decentralised Agriculture and the SPSP for Rural Feeder Roads, taking into account the potential environmental impacts of their implementation and their consistency with the GoR's and EU's environmental policies and objectives;
- recommendations for the formulation (Action Fiche and Technical-Administrative Provisions) of the SPSP Rural Feeder Roads and the review of the SBS for Decentralised Agriculture; including performance indicators, the use of Technical Assistance, other aid delivery methods and recommendations for sector programme enhancement;
- strategic environmental recommendations for the review of SPTA-II and preparation of SPTA-III;
- recommendations to the GoR for the enhancement of the environmental performance of the SPTA in general and for the environmental mainstreaming and integration of environmental Key Performance Indicators (KPIs) for SPTA-III in particular; as well as strategic measures at the policy, institutional and regulatory levels. The Ministry of Trade and Industry (MINICOM), in collaboration with the Private Sector Federation and REMA, developed with UNEP and UNIDO project a strategy for mainstreaming Resource Efficient and Cleaner Production (RECP) in Rwanda's, which reviewed national development as well as sectoral PPPs including SPTA II. The review identifies limitations as well as key potential entry points for mainstreaming RECP for SPTA, which should be included in the key aspects for consideration by the SEA, and possibly formulated into environmental performance indicators.

- recommendations to the EU which may include possible adjustments of environmental and socio-economic performance indicators, accompanying measures to deal with identified challenges (notably in the area of M&E capacities), as well as priority issues for policy dialogue and coordination with GoR and DPs.

3. EXPERTS PROFILE AND EXPERTISE REQUIRED

3.1 NUMBER OF REQUESTED EXPERTS PER CATEGORY AND NUMBER OF MAN-DAYS PER EXPERT OR PER CATEGORY

The consulting company must specify the qualifications and experience of each specialist to be assigned to the SEA study. The company should indicate if/how they intend to use local experts and how they will contribute to the transfer of know-how throughout the study.

For each specialist proposed, Curriculum Vitae must be provided of no more than 3 pages setting out the relevant qualifications and experience.

It should be noted that civil servants and other staff of the public administration in Rwanda cannot be recruited as experts, unless prior written approval has been obtained from the National Authorising Officer.

The Consultant's team will be based in Kigali and work closely with the Ministry of Agriculture and Animal Resources (MINAGRI), the Ministry of Natural Resources (MINIRENA) and its Rwanda Environmental Management Authority (REMA), the Rwanda Natural Resources Authority (RNRA), the Ministry of Infrastructure (MININFRA), the Ministry of Local Government (MINALOC), the National Authorising Officer/MINECOFIN and relevant Non-State Actors (NSAs).

The Consultant's study team will comprise a team of at least 3 experts, comprising:

Expert 1 - Category Senior (Team leader): Environmental/SEA Expert;

Expert 2 - Category Senior (Sector-Expert): Agriculture, Rural Development, Environment

Expert 3 - Category Junior: Local/Regional Expert

The number of foreseen person-days is as follows (indicative):

Expert 1: 57 person-days split up into:

- 22 person-days for the Scoping study
- 35 person-days for the SEA study.

Expert 2: 54 person-days split up into:

- 22 person days for the Scoping study
- 32 person days for the SEA study.

Expert 3: 52 person-days split up into:

- 21 person days for the Scoping study
- 31 person days for the SEA study.

3.2 EXPERTS PROFILE:

Common features to all experts:

- Full working knowledge of English;
- At least one expert with full working knowledge of Kinyarwanda will be an asset;
- Excellent report writing and communication skills;
- At least one expert with experience in environmental sector policies and regulations;
- At least one expert with extensive experience in environmental stakeholder consultations;
- At least two experts should have sector-related expertise (agriculture, rural roads);
- At least one expert has working experience in Rwanda, preferably related to environmental or socio-economic assessments. Preference will be given to applications that include collaboration with at least one of the Environmental Impact Assessment experts authorised by MINIRENA: http://www.rema.gov.rw/rema_doc/publications/List%20of%20EIA%20EXPERTS%20_2_.pdf
- Experience in the country or region will be an asset, as well as knowledge of EU procedures of aid delivery mechanisms.

Key Expert (Category Senior): SEA Expert - Team Leader

Qualifications and Skills

- University degree or post-graduate studies in relevant fields (agronomy, environmental sciences, geography, rural/civil engineering, agricultural or environmental economist)
- Experience in development and conducting SEAs and/or similar environmental assessment assignments; at least one of this assignments has been done as a team leader
- Fully conversant with the EU's Project Cycle Management Aid Delivery methodologies – including Sector Policy Support Programmes and Sector Budget Support
- SEA experience in the agricultural sector will be favoured
- Over the last seven years, at least one relevant experience in developing countries, preferably in Eastern and/or Central Africa.

Expert 2 (Category Senior): Sector-Expert (Agriculture, Rural Development, Environment)

Qualifications and Skills

- University degree or post-graduate studies in relevant fields (agronomy, environmental sciences, geography, rural engineering, agricultural or environmental economist)
- Over the last five years, at least one working experience in applying environmental assessment tools, preferably in the agricultural sector
- Over the last seven years, at least two relevant experiences in developing countries, preferably in Eastern and/or Central Africa.

Expert 3 (Category Junior): Local/Regional Expert

Qualifications and Skills

- Bachelor's degree level in relevant fields (agronomy, environmental sciences, geography, rural engineering, agricultural or environmental economist)
- Over the last five years, at least one working experience in environmental assessment of rural investments in Rwanda or the region, preferably in the agriculture sector or rural road subsector.
- Over the last five years, at least one relevant experience in developing countries, preferably in Eastern and/or Central Africa.

4. LOCATION AND DURATION

4.1 STARTING PERIOD

It is expected that the assignment shall commence as soon as possible after the signature of the specific contract, but not later than 3 October 2011.

4.2 FORESEEN FINISHING PERIOD OR DURATION

The overall duration for the assignment is spread over a maximum of 94 calendar days (= total performance period; including start-up period, performance period, reporting, submission of comments and final report) and allows for an indicative workload of 57 working days for Expert 1 (Category Senior), 54 working days for Expert 2 (Category Senior) and 52 working days for Expert 3 (Category Junior). The draft SEA report should, in any case, be available by 12 December 2011.

4.3 PLANNING

The working plan should include, but not necessarily be limited to, the following activities:

Scoping study

- Fact finding/data collection
- Review of prior public consultations, identification of key stakeholders
- Engagement of stakeholders
- Analysis/preparation of recommendations and Scoping Report.

SEA study

- Fact finding/data collection
- Field trips
- Engagement of stakeholders
- Identification and detailed analysis of the potential environmental impacts
- Preparation of recommendations to mitigate negative environmental effects (and constraints) and optimise positive effects (and opportunities)
- Preparation of recommendations and draft SEA report
- Preparation of the final SEA report.

On the basis of this draft proposal and the timelines outlined in the ToR, the company must provide their detailed work plan, describing how she/he will address the issues in both the scoping and study phases, as well as the linkages between the two stages. The following time schedule (Table 2) is proposed (estimated working days). The specific inputs and timings for Expert N° 2 and Expert No 3 will be refined at the end of the scoping phase.

Table 2: Indicative Time Schedule

Activity	Itinerary	Expert person-days (working days)			Location
	Calendar days of mission	Expert 1 (Senior I)	Expert 2 (Senior II)	Expert 3 (Senior III)	
1. Scoping Study		**22**	**22**	**21**	
1.1 Travel to Rwanda	Day 1	1	1		Travel
1.2 Kick-off meeting with EU, MINAGRI and other key stakeholders	Day 2	1	1	1	Kigali
1.3 Review of key documents and preparation of stakeholder engagement strategy	Day 3 - 7	5	5	5	Kigali
1.4 Key stakeholder consultations and review of material	Day 8 - 19	8	8	8	Rwanda
1.5 Preparation and submission of draft Scoping Report	Day 20- 22	3	3	3	Kigali
1.6 Presentation to key stakeholders	Day 23	1	1	1	Kigali
Feedback-period for draft	Day 23-29				
1.7 Finalisation of scoping report	Day 24-33	3	3	3	Kigali
2. SEA Study		**35**	**32**	**31**	
2.1 Kick-off meeting with EU, MINAGRI and other key stakeholders	Day 27	1	1	1	Kigali
2.2 Review and preparation of material for SEA study	Day 28- 31	4	4	4	Kigali
2.3 Stakeholder consultations and field visits	Day 34- 61	20	20	20	Rwanda
2.4 Preparation and submission of draft SEA report	Day 64-68	5	5	5	Kigali
2.5 Presentation of draft SEA report to key stakeholders	Day 71	1	1	1	Kigali
2.6 Travel to place of residence	Day 72	1	1		Travel
Feedback-period for draft	Day 71-84				
2.7 Finalisation of final SEA report	Day 85-87	3			Place of residence
Total		**57**	**54**	**52**	

4.4 LOCATION(S) OF ASSIGNMENT

The Consultant will be based in Kigali with frequent journeys into the country. In order to allow for interviews with the beneficiaries in the field, the Consultant should employ the services of an interpreter during some of the field visits.

5. REPORTING

The final timetable of report submission will be established on the base of the methodology presented by the Consultant in his offer.

In order to facilitate decision making and project progress, the Consultant shall arrange a presentation meeting/workshop of key parties for each reporting stage on or immediately following its delivery date, to discuss its findings and recommendations. Where possible, reports will be delivered to the relevant stakeholders at least four (4) days before the proposed presentation. Following that meeting, the Consultant will proceed with his work on the basis of the minutes/comments at that meeting and work that is not materially affected by the decisions to be made.

Where possible, the EU Delegation will send a formal response to the report being considered immediately following the meeting. If decisions are not made at the presentation and no instruction is received from the Delegation within a seven (7) calendar days period (for the Scoping Study Report) or fourteen (14) calendar days (for the SEA Study Report), the Consultant's report shall be assumed to have been accepted. Any unilateral decisions or inputs made by the Consultant within this period are at his or her risk. In case of doubt the Consultant will always seek clarification from the EU Delegation before proceeding.

5.1 CONTENT

The scoping study must be presented in the format given in Appendix 1.

The feedback of the EU Delegation on the Scoping study will set the scope of the SEA study. The conclusions of the study must be presented in the SEA report in the format given in Appendix 2. The underlying analysis is to be presented in appendices to this report. All supporting analytical material and stakeholder reports will be presented in appendices to the report.

5.2 LANGUAGE

The Consultant will submit all reports in English language.

5.3 SUBMISSION / COMMENTS TIMING

Scoping study

The detailed stakeholder engagement plan must be presented two weeks after kick-off; seven copies (in total) are to be presented to: the NAO/MINECOFIN, MINAGRI, MININFRA, MINALOC, MINIRENA/REMA, RNRA and the EU Delegation, for comments.

The draft scoping report, in seven copies, is to be presented to the aforementioned institutions for comments three (3) weeks after the kick-off meeting of the Scoping study. Comments should be expected within seven (7) calendar days. The company will take account of those comments in preparing the final scoping report. Seven copies of the final scoping report in English language are to be submitted five (5) weeks after the kick-off meeting.

The distribution of reports in the stated number of paper and electronic copies to each recipient is described in chapter 5.4. MINAGRI will be in charge of disseminating the report to the relevant stakeholder institutions.

SEA study

The SEA study will start four (4) weeks after the kick-off meeting for the Scoping study, with a start-up meeting to be organized by the Consultant in close coordination with MINAGRI and the EU Delegation.

The draft SEA report in seven copies is to be presented to NAO/MINECOFIN, MINAGRI, MININFRA, MINALOC, MINIRENA/REMA, RNRA and the EU Delegation for comments, no later than seven (7) weeks after the start-up meeting. Within two (2) weeks, comments will be received from the aforementioned authorities.

The company will take account of these comments in preparing the final report. Seven copies of the final report in English are to be submitted no later than nine (9) weeks after the start-up meeting of the SEA study.

The distribution of reports in the stated number of paper copies and one electronic version to each recipient is described in chapter 5.4. MINAGRI will be in charge of disseminating the report to the relevant stakeholder institutions

5.4 NUMBER OF REPORT(S) COPIES

Table 1 A: Target institutions for the Scoping study report

	Stakeholder Report	**Draft Scoping Report**	**Final Scoping Report**
NAO/MINECOFIN	1	1	1
MINAGRI	1	1	1
MININFRA	1	1	1
MINALOC	1	1	1
MINIRENA / REMA	1	1	1
EU Delegation	1	1	1
RNRA	1	1	1

Table 1 B: Target institutions for the SEA report

	Stakeholder Report	**Draft SEA Report**	**Final SEA Report**
NAO/MINECOFIN	1	1	1
MINAGRI	1	1	3
MININFRA	1	1	1
MINALOC	1	1	1
MINIRENA / REMA	1	1	2
EU Delegation	1	1	2
RNRA	1	1	1

6. ADMINISTRATIVE INFORMATION

6.1 INTERVIEWS

Telephone interviews with the proposed experts may be conducted by the Evaluation Committee during the evaluation of offers.

6.2 LIMITS TO SUBCONTRACTING

Sub-contracting is only possible in accordance with Article 4 of the General Conditions governing Framework Contract Beneficiary 2009.

6.3 LANGUAGE OF THE SPECIFIC CONTRACT

The specific contract shall be written in English.

6.4 REQUEST FOR A SUCCINCT METHODOLOGY

The Framework Contractor is herewith requested to present - together with the presentation of the CVs and the financial offer - a short methodology for the organization of the assignment. It should briefly explain the methodology to be used and include a work plan (activity and resource schedule) together with expected inputs and outputs of the expert/s. The methodology should not exceed a maximum of 4 pages.

The proposal must include an understanding of the Terms of Reference and a description of the general approach to the whole SEA in accordance with these ToR, highlighting the following: the proposed methodology for the participation of stakeholders; the proposed approaches for the definition of the environmental baseline; and the proposed methodologies for impact identification and evaluation.

6.5 MANAGEMENT TEAM MEMBER PRESENCE REQUIRED OR NOT FOR BRIEFING AND/OR DEBRIEFING

The presence of a Management Team Member is not required during the briefing/debriefing sessions.

6.6 OTHER AUTHORIZED ITEMS TO FORESEE UNDER 'REIMBURSABLE'

The specific contract type is a global price contract with a maximum available budget of €199,999. The budget can include (1) fees and (2) reimbursable expenses. The breakdown shall be given by the Consultant in his offer, in compliance with the standard form. In addition to fees, perdiems and international travel costs to and from Rwanda, the reimbursable costs shall include:

- a provisional sum for local transport outside of Kigali (travel within Kigali is covered by the per diem),

- a provisional sum to cater for workshops,

- a provisional sum for translation, interpreter, photocopy, printing,, and

- a provisional sum for other costs consistent with the proposed methodology and terms of references (e.g. database / tool development costs).

The budget for reimbursable costs may not be used for the purchase of equipment. The use of reimbursables is governed by the provisions in the General Conditions.

The Consultant shall be fully responsible to provide all experts with work and accommodation premises to enable them to carry out their mission in the best possible logistical conditions and ensure that experts have the requisite equipment and resources, notably sufficient administrative and secretarial provision to enable them to concentrate fully on their assignment.

10. Appendices

Appendix 1. Standard format for the SEA scoping report

Maximum length of the main report (without appendices): 25 pages.

The following text appears on the inside front cover of the report:

This report is financed by the European Union through the European Commission and is presented by the [*name of consultant*] for the … [*National Institutions*] and the European Commission. It does not necessarily reflect the opinion of the … [*National Institutions*] or the European Commission.

1. Executive summary

2. Description of the sector programme under consideration

3. Overview of the policy, institutional and legislation framework

4. Description of key stakeholders and their concerns

5. Description of key environmental aspects to be addressed in the SEA study

6. Description of the scope of the environmental baseline to be prepared in the SEA study

7. Recommendations on specific impact identification and evaluation methodologies to be used in the SEA study

8. Proposal of timeframes and resources needed for the SEA study

9. Technical appendices

    I. Stakeholder engagement methodology

    II. List of stakeholders engaged or consulted

    III. Records of stakeholder participation

    IV. List of documents consulted.

Appendix 2. Standard format sector SEA report

The following text appears on the inside front cover of the report:
This report is financed by the European Union through the European Commission and is presented by the [*name of consultant*] for the … [*National Institutions*] and the European Commission. It does not necessarily reflect the opinion of the … [*National Institutions*] or the European Commission.

Maximum length of the main report (without appendices): 100 pages.

1. Executive summary

2. Scope

3. Background

    3.1 Sector programme justification and purpose

    3.2 Alternatives

    3.3 Environmental policy, legislative and planning framework

4. Approach and methodology

    4.1 General approach

    4.2 Geographical or environmental mapping units

    4.3 Assumptions, uncertainties and constraints

5. Environmental baseline study

6. Impact identification and evaluation

7. Mitigation or optimising measures

8. Indicators and institutional capacities

9. Conclusions and recommendations

    9.1. General conclusions
    9.2. Recommendations for SPTA-III and MINAGRI.
    9.3. Recommendations for the EU programmes: SPSP formulation (SBS Rural Feeder Roads) and SBS Decentralised Agriculture programme enhancement.
    9.4. Recommendations for other institutions and stakeholders.
    9.5. Recommendations for the follow-up and monitoring of the implementation of the results of the SEA study

10. Technical appendices

- Maps and other illustrative information not incorporated into the main report
- Other technical information and data, as required
- List of stakeholders consulted/engaged
- Records of stakeholders' participation

11. Other appendices

- Study methodology/work plan (2–4 pages)
- Consultants' itinerary (1–2 pages)
- List of documentation consulted (1–2 pages)
- *Curricula vitae* of the consultants (1 page per person)
- Terms of Reference for the SEA.

Photography

Photographs with captions for Final Report Rwanda Agriculture SEA

Suggested placement: final page/back cover of Main Report, otherwise final page of Book of Annexes.

Meeting after community tree-planting works in Kirehe District (Umuganda)

Mulching (CIP banana in Mushikiri sector,) Kirehe district

Road embankment soil erosion , Karongi district, Mubuga sector.

Bench terraces in Karongi sector (Musenyi)

Risk management: Inter-planting climbing beans and maize, Nyagatare District

Risk management: Inter-planting climbing beans and maize, Nyagatare District

Left to right:

Dr. Alexis Gakuba, Regional Expert: Strategic Environmental Assessment, infrastructure Environmental Impact Assessment, social development and communication, SAFEGE

Dr. Juan Palerm, Expert: Strategic Environmental Assessment, policy and institutional development, SAFEGE

Michael Kabiligi – Acting Director - Natural Resources Management, Rwanda Agricultural Board Eastern Zone

Driver 'Francis'

John Pratt, Team Leader: agriculture, agro-industry and quality/standards infrastructure, trade and rural development, SAFEGE

Madeleine Usabyimbabazi, Professional in Charge of Environmental Mainstreaming, Ministry of Agriculture and Animal Resources (deployed by Rwanda Environmental Management Authority"