European Commission

Integrating the environment and climate change into EU international cooperation and development: Towards sustainable development

SECTOR NOTE: AGRICULTURE, FOOD SECURITY AND RURAL DEVELOPMENT




This sector note has been prepared to complement the European Commission (EC) Guidelines on *Integrating the environment and climate change into EU international cooperation and development: Towards sustainable development* (EC, 2016a; hereafter referred to as 'the Guidelines'). It provides specific guidance for actions in agriculture, food security and rural development — which, because they face similar challenges regarding the environment and climate change, are here treated as a single sector. The Guidelines and other mainstreaming tools are available on Capacity4Dev.

Part 1: Policy basis

Following is a brief review of policies, principles and strategies from the European Union (EU) that address development of this sector, with particular reference to or bearing on environment and climate change.

The **2030 Agenda for Sustainable Development** (UN, 2015) and the **Paris Agreement on Climate Change** (UNFCCC, 2015) demand a radical acceleration of environment and climate change mainstreaming into development policies, plans and programmes.

The 2030 Agenda is a commitment by world leaders to balance economic, social and environmental objectives. It puts environmental sustainability and climate change at the heart of development. Mainstreaming environment and climate change into agriculture, food security and rural development is essential to achieving many of the Sustainable Development Goals (SDGs), particularly the following.

- **Goal 2 — No hunger.** Mainstreaming as part of good sector practice builds the resilience of the poor and vulnerable and reduces their exposure and vulnerability to climatic and environmental shocks. Mainstreaming can increase productivity, e.g. by helping maintain ecosystems upon which production depends. In particular, achieving Targets 2.4 (ensuring that food production is sustainable) and 2.5 (maintaining genetic diversity of plants and animals) requires effective mainstreaming.

> **'...agricultural production will need to increase by at least 70 per cent to meet demands by 2050. Most estimates also indicate that climate change is likely to reduce agricultural productivity, production stability and incomes in some areas that already have high levels of food insecurity'.**
>
> — FAO, 2010

- **Goal 15 — Life on land.** Mainstreaming is central to this goal which aims to 'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'. In particular, Target 15.9 (integrating ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts) is closely linked to the mainstreaming approach of ensuring that environment and climate change are integrated early on in planning and development processes.
- **Goal 14 — Life below water.** Mainstreaming is central to this goal which aims to 'conserve and sustainably use the oceans, seas and marine resources', and covers land-based activities (Target 14.1) as well as sea-based, notably fisheries (Target 14.4).

The Paris Agreement on Climate Change, adopted in the context of the United Nations Framework Convention on Climate Change (UNFCCC), is the first-ever universal, legally binding global climate agreement. It outlines a strong shared vision and ambition to combat climate change and undertake actions and investment that promote low-carbon, resilient and sustainable development. Mainstreaming environment and climate change into agriculture, food security and rural development contributes to the achievement of the agreement, as agricultural activities and associated land use changes are a major source of greenhouse gases (GHGs). The sector is also key to many of the climate change adaptation measures proposed — e.g. development and use of drought-resistant crops. Many developing countries include agriculture and food security actions as part of their intended nationally determined contributions (INDCs). These INDCs are a central feature of the Paris Agreement and become nationally determined contributions (NDCs) upon country ratification of the agreement. Most Parties to the UNFCCC include agriculture in their mitigation targets (80%) and adaptation strategies (64%) (CCAFS, 2015).

At the EU level, the 'Proposal for a new European consensus on development: Our world, our dignity, our future' (EC, 2016b) recognizes that

> Sustainable agriculture and food systems, including sustainable fisheries, will have to address the needs of a growing global population while protecting the environment. ... Sustainable agriculture, together with sustainable fisheries and aquaculture, remains a key driver for poverty eradication and sustainable development.

The communication reaffirms the commitment of the EU and its Member States to support agriculture systems that do not harm the environment and 'harness the greenhouse gas mitigation potential of agriculture, while enhancing resilience to climate change impacts'; improved access to water 'without damaging effects on the environment', through support for sustainable and integrated water management. The global strategy for the EU's foreign and security policy, 'Shared vision, common action: A stronger Europe' (EU, 2016), commits the EU to 'support governments to devise sustainable responses to food production and the use of water and energy through development, diplomacy and scientific cooperation'.

The **budget for Europe 2020** and the endorsement of the **Hyderabad objective** commit the EU to

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By 2050, the number of people at risk of hunger is expected to increase by an additional 10–20% as a result of climate change, and the number of malnourished children is expected to increase by 20 million — 29% more than without climate change (WFP, 2009)

Agriculture is responsible for 75% of global deforestation (CCAFS, 2014), and accounts for about 70% of global freshwater withdrawals — up to 90% in some fast-growing economies (WWAP, 2012)

Some 19–29% of global GHG emissions arise as direct food system emissions; the livestock sector alone accounts for about 14.5% of anthropogenic GHG emissions (CCAFS, 2014); and is the single largest anthropogenic user of land (Vermeulen et al., 2012)

significantly increase spending on actions related to climate change and biodiversity.

- 'A budget for Europe 2020' (EC, 2011a) stipulates that 'Climate action objectives will represent at least 20% of EU spending in the period 2014–2020'. The EU budget will also contribute to the international climate finance funding foreseen for developing countries by 2020 (USD 100 billion yearly) in the UNFCCC negotiations (EC, 2011a).

- The EU has endorsed the Hyderabad objective to 'double total biodiversity-related international financial resource flows to developing countries by 2015 compared to an agreed average from 2006–2010 and to at least maintain support at that level until 2020' (UNEP, 2014). Agriculture, food security and rural development represent a sector with high potential for contributing to meeting these pledges.

There are a variety of other policy commitments which require an increasing focus on mainstreaming environment and climate change into the agriculture, food security and rural development sector.

- The communication on 'Fighting rural poverty' (EC, 2002) notes that 'environmental assessments must be mainstreamed into aid policy making and programming', with the aim 'to identify and promote win-win solutions that benefit both the rural poor and the environment, and to minimise trade-offs between environmental protection and rural poverty reduction'.

- 'Increasing the impact of EU development policy: An agenda for change' (EC, 2011b) highlights sustainable agriculture as one of the sectors where the EU should focus its support for inclusive and sustainable growth due to its strong multiplier impact on developing countries' economies and its central role with regard to environmental protection and climate change prevention and adaptation.

- The 'EU policy framework to assist developing countries in addressing food security challenges' (EC, 2010) establishes that sustainable small-scale food production should be the focus of EU assistance to increase the availability of food in developing countries. It emphasises that EU assistance should prioritise intensification approaches 'that are sustainable and ecologically efficient' (e.g. integrated pest management, improved soil and water management, stress-resistant crop varieties). The importance of mainstreaming climate change is further highlighted in 'Boosting food and nutrition security through EU action: Implementing our commitments' (EC, 2013a) and 'Enhancing maternal and child nutrition in external assistance: An EU policy framework' (EC, 2013b). These documents stress that actions which promote sustainable agriculture are highly relevant to food and nutrition security as well.

- 'The EU approach to resilience: Learning from food security crises' (EC, 2012) emphasises the need to address chronic vulnerability to food insecurity and recurrent food crises caused by climate change, desertification, environmental degradation and pressure on natural resources; and to build the resilience of rural populations in vulnerable countries. It acknowledges that sustainable development will need to tackle the root causes of recurrent crises

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positive trends

By 2012, almost **125 million** hectares of land were under conservation agriculture, compared to about 72 million hectares in 2003, an expansion of more than 7 million hectares per year (Friedrich et al., 2012)

From 2003 to 2009, the global extent of agroforestry increased by over **140 million** hectares (Zomer et al., 2014); in Niger's Zinder Region, the piloting of new policies facilitated the establishment of **5 million** hectares of agroforestry, leading to a 500 000-tonne increase in millet/sorghum production (WRI, 2015)

rather than just their consequences, and that resilience strategies should contribute to the EU Climate Change Adaptation Policy. To this end, it presents an approach developed in two recent EC initiatives, Supporting Horn of Africa Resilience (SHARE) and Alliance Globale pour l'Initiative Résilience Sahel (AGIR). The main components of this approach are (i) anticipating crises by assessing risks, (ii) focusing on prevention and preparedness and (iii) enhancing crisis response.

- The EU is also a member of the Global Donor Platform for Rural Development, a group of 30 donors and development agencies whose goal is to bring rural development policies in line with the Paris Declaration on Aid Effectiveness. The platform members recognise the critical importance of mainstreaming climate change into agriculture and rural development (Global Donor Platform for Rural Development, 2013).

Part 2: Why mainstream?

The agriculture, food security and rural development sector offers huge opportunities to enhance the environment, reduce GHG emissions, build resilience and improve capacity to adapt to climate change. Improved land use and sustainable land management generates multiple benefits in terms of food security, livelihoods, economic development and ecosystem services. Good practice developed in this sector has, after many years, led to innovative and robust approaches and techniques for enhancing environment through the use of sustainable agriculture — e.g. soil and water conservation, agroforestry, minimum tillage techniques, integrated pest management and others. Good practice has also led to advances in building the resilience and enhancing the food security of vulnerable populations in drought-prone regions, including the introduction of innovations such as improved animal health services and rainfall insurance.

Agriculture and livestock production require the most land area of all human activities, are dependent on healthy land and water ecosystems, and are highly vulnerable to climate change. The sector consumes significantly more water than all other human uses combined and is a major source of GHG emissions. Hence, addressing environmental and climate change considerations as an integrated part of agriculture sector development is a prerequisite for achieving environmental sustainability and curbing climate change. Conversely, maintaining environmental integrity is critical to continued agricultural productivity and food security, and to increasing rural incomes in developing countries. Also, agricultural systems must be resilient and able to adapt to the changed conditions resulting from climate change.

Understanding farmers' and livestock breeders' risk management strategies and the reasons underlying their choices is critical, as these can have a profound impact on environment and climate change. On the one hand, farmers and breeders may seek quick returns which degrade the natural resource/asset base and productive potential (and release carbon into the atmosphere); on the other, they may choose to invest in maintaining or enhancing the productive capacity of their land and other natural resources (and sequester carbon in soil and vegetation).

Integrating environment and climate change into food and farming policies can help ensure agricultural productivity is maintained or even increased so the future demands of a growing population can be met.

The objectives of mainstreaming are to address risks and exploit opportunities, both in relation to programme/project delivery as well as to their broader influence and impact. Such mainstreaming directly supports multiple SDGs and will (i) minimise negative impacts on environment and climate; (ii) contribute to sustainable management of land and other natural resources; (iii) ensure that agriculture, food security and rural development strategies and investments are resilient to climatic shocks and environmental influences and/or contribute to climate change mitigation; and (iv) ensure that the sector continues to contribute to the improvement of livelihoods and the well-being of the population.

Mainstreaming is defined by the EC as 'the process of systematically integrating a selected value/idea/theme into all domains of the EU development cooperation to promote specific as well as general development outcomes' (EC, 2016a). Mainstreaming involves an iterative process of change in the culture and practices of institutions, aimed at balancing environmental, economic and social objectives and contributing to sustainable development.

Table 1 presents the key reasons to mainstream environment and climate change into sector development; the four categories noted in the table provide a structure for presenting opportunities for mainstreaming in this guidance note. Part 4 provides concrete guidance for mainstreaming. It enumerates risks and opportunities posed by agriculture, food security and rural development sector programmes/projects and activities and highlights how they can be addressed.

Table 1 Why mainstream environment and climate change in the agriculture sector?

To address environment and climate–related risks and constraints that could jeopardise achievement of the objectives of partner policies, plans and programmes supported by the EU	• **To ensure that partner policies, plans and programmes supported by the EU are sustainable in light of climate change** (e.g. crops promoted are drought resistant, irrigation schemes take future water availability into account) — agriculture and food security are highly vulnerable to the impacts of climate change such as droughts and dry periods, floods and increasingly unpredictable rainfall patterns • **To ensure that the results of partner policies, plans and programmes supported by the EU are not threatened by environmental degradation** — agricultural production depends on natural resources and ecosystem services, so land degradation, water scarcity, water pollution and damage to ecosystems/biodiversity (e.g. invasive species and pests) can have detrimental impacts on productivity, food security and rural incomes
To identify, avoid and mitigate any harmful impacts of EU development cooperation on the environment and climate	• **To ensure that partner policies, plans and programmes supported by the EU do not cause significant environmental damage, including impacts on biodiversity** — agriculture is a major driver of environmental degradation (e.g. deforestation and destruction of wetlands caused by agricultural expansion, land degradation and erosion caused by cultivation and grazing of slopes and marginal lands, pressure on water resources due to abstraction for irrigation, pollution from the use of agrochemicals) • **To ensure that partner policies, plans and programmes supported by the EU do not significantly increase GHG emissions** — agriculture is a significant source of GHG emissions (e.g. methane emissions from ruminant livestock and paddy rice fields, carbon dioxide emissions from land conversion and clearance of natural vegetation, carbon released from the soil due to tillage)
To realise opportunities for longer-term benefits for socio-economic development	• To maintain/enhance **agricultural productivity, food security and agricultural income** over the long term • To generate/enhance **rural income opportunities** based on sustainable natural resources management and ensuring the delivery of ecosystem services (e.g. catchment protection, storage of carbon in vegetation) • To integrate environmentally sustainable **low-carbon options** in programme/project activities (e.g. improved storage and processing to reduce post-harvest losses, conservation agriculture) • To leverage **carbon finance** for enhanced programme/project sustainability, outreach and impact (e.g. access to additional funding from the REDD+ (reducing emissions from deforestation and forest degradation) mechanism, the Global Environment Facility, the Green Climate Fund, etc.) • To **reduce people's vulnerability** to external shocks and threats to their lives and livelihoods (e.g. crop loss and food insecurity due to drought or floods) • To generate **green jobs** (e.g. in agro-industries), contributing to the transformation to a **green economy**
To realise opportunities contributing to EU policies on environment, climate change and biodiversity	• To contribute to global efforts to **reduce GHG emissions** • To achieve **sustainable natural resources management** and ensure the delivery of ecosystem services (e.g. catchment protection, storage of carbon in vegetation) • To ensure sector development will **not interfere with global commitments** to protect biodiversity and combat desertification

Part 3: When and how to mainstream?

There are opportunities for mainstreaming throughout the cycle of operations. Table 2 shows entry points and mainstreaming tools and actions that can be used or taken at different stages of the cycle. Policy dialogue (Box 1) occurs at all phases as an ongoing process.

Guidance for each phase is provided below; also see the Guidelines for definitions of the tools and other key terms.

Programming

Identifying environmental and climate change risks and opportunities early on in the cycle of operations means they will be more effectively addressed, as necessary financial provisions can be made and the framework set for mainstreaming in subsequent phases.

The key elements of EU development cooperation in any given country or region are specified in the programming documents, particularly the Multiannual Indicative Programmes (MIPs) which highlight the overall and specific objectives, expected results and programming indicators in selected focal areas.

Entry point: Country situation analysis

The country situation analysis is the first entry point for mainstreaming in the programming phase. If programming has been completed, the country situation analysis can be updated in preparation of mid-term reviews, where they are planned, or in the preparation of future programming cycles.

Mainstreaming action: **Analyse the country environmental and climate change context.**

The analysis should provide an overview of a country's environmental and climate change issues, as well as of the related institutional, policy and regulatory framework. It should assess these vis-à-vis their relationship to poverty, look at previous and ongoing donor support, and provide recommendations for better mainstreaming. A succinct and proven tool for undertaking this analysis is the country environmental profile (CEP), which identifies and analyses key environmental and climate challenges and opportunities, and informs strategic orientations in light of these. The CEP should also cover the economic opportunities linked to improved environmental management and climate change mitigation and adaptation. Important points to map in the agriculture, food security and rural development sector include the following:

- **the nature, magnitude and severity of environmental degradation caused by agriculture** — e.g. erosion, deforestation and loss of biodiversity, hydrological impacts, GHG emissions, and water pollution from fertilisers and agro-industry;
- **the nature, magnitude and severity of impact on agriculture that environmental degradation and climate change have and are likely to have** — e.g. reduced productivity and crop loss due to droughts and floods;
- **the strategies used by farmers and livestock breeders to manage risk and their impact on the environment** — e.g. whether farmers seek quick-return solutions which degrade the resource base and long-term productive potential, or engage in medium- to long-term investments to maintain or enhance land productivity;
- **the drivers of unsustainable land use practices** — e.g. increased pressure due to population growth; competition for land, water and other natural resources; illegal logging; and urbanisation and policies promoting land conversion;
- **obstacles to the adoption of sustainable land management practices** — e.g. lack of information on sustainable practices from extension services, poor access to financial services for investments in improved practices, insecure land rights (a disincentive to investing in medium- to long-term improvements) and perverse subsidies;
- **underlying reasons for vulnerability to climate variability/change and extreme events** — e.g. lack of alternative/supplementary income opportunities, dependence on crops/varieties which are not drought tolerant, poor access to weather information and warning systems, and poor access to insurance;

Table 2 Mainstreaming opportunities throughout the cycle of operations

PHASE	MAINSTREAMING TOOL OR ACTION	
Programming	• Country environmental profile (CEP)	Policy dialogue/capacity development
Identification and formulation	• Environmental and climate change screening and identification of needs for a strategic environmental assessment (SEA), environmental impact assessment (EIA) or climate risk assessment • SEA • EIA • Climate risk assessment (CRA) • Rio markers	
Implementation	• Environmental management plan (EMP) • Climate risk management plan (CRMP) • Monitoring indicators • Results-oriented monitoring (ROM) missions	
Evaluation	• Evaluation indicators	

BOX 1 Policy dialogue: A key element of effective mainstreaming

Experience shows that simply applying environmental impact and assessment tools does not necessarily result in improved environmental and climate-related performance of a sector policy, programme or project, especially if they remain donor-led exercises with little or no national ownership. This is where policy dialogue comes in. Such dialogue can help partner governments and the EU reach consensus on the goals and priorities of development cooperation, and it plays a critical role in the promotion of the environment and climate change mainstreaming agenda.

Policy dialogue takes place throughout the entire cycle of operations. Environment and climate change should be an integral part of this dialogue, with key points raised including the following:

- **relevance of mainstreaming from a development perspective**, e.g., to address the economic costs of environmental degradation and climate change (e.g. the impact of land degradation on agricultural productivity and exports), as well as the economic benefits provided by ecosystem services (e.g. increased production and revenue generation from rehabilitating degraded lands);
- **need for, and value of, monitoring the sector's environmental performance and climate resilience to allow for informed decision-making**, e.g. to validate that policies promoting production and export of an agricultural commodity are not having negative environmental impacts or increasing vulnerability to the impacts of climate change;
- **options for mitigating negative environmental impacts on the sector** (see Part 4 for examples);
- **options for harnessing the social and economic benefits of sustainable use of natural resources**, e.g. to enhance agricultural productivity and generate new opportunities for rural incomes;
- **capacity and institutional needs to enable national stakeholders to engage in these options**, e.g. the awareness and capacity of extension services to promote sustainable agricultural practices; collection of data on environmental indicators; and inclusion of environmental issues in sector policies, plans and budgets;
- **reflection on lessons learned and environmental performance of the sector**, e.g. experiences with agroforestry, conservation agriculture, rangeland management and organic farming.

Policy dialogue is most effective when backed up with evidence and information, such as data, studies and examples of previous experiences.

- **opportunities and locally available capacities** — e.g. traditional knowledge, local agrobiodiversity and varieties adapted to local conditions; new opportunities such as income generation from ecosystem services.

If a CEP is not available and cannot be developed, a range of other documents can be consulted for information on a country's environmental and climate change situation. Part 5 provides a list of possible sources of information. Box 2 provides an example of CEP use in the programming phase.

Entry point: Drafting the programming documents

Mainstreaming action: **Integrate environment and climate change into the Multiannual Indicative Programme.**

Based on the potential harmful effects, risks, challenges and opportunities identified earlier, the next step is to explore how to mainstream climate change and environment into the cooperation strategy. Opportunities to avoid or mitigate environmental damage, contribute to climate change mitigation and resilience, and support the transition to a green economy should be reflected in the MIP's overall objective, specific objectives, expected results and/or indicators. Part 4 provides examples of specific measures to promote environmental sustainability and address climate change in the agriculture, food security and rural development sector.

In identifying opportunities for mainstreaming, consider the following actions.

- **Develop or strengthen the policy and regulatory framework** (e.g. regulation of water use; cultivation on slopes and marginal lands; clearing of new land for agriculture and pastures; ownership of and access to land, forestry and other natural resources).

- **Build capacity** of agricultural extension services, private sector actors and farmers' associations to promote/implement environmentally sustainable and climate-resilient practices (e.g. sustainable agronomic and livestock practices, post-harvest storage/processing to reduce losses, green jobs, climate change vulnerability assessments).

BOX 2 Case study: 2014–2020 Multiannual Indicative Programme for Honduras

Food security with a focus on family agriculture is a priority sector in Honduras's MIP for 2014–2020. The programme takes into account recommendations resulting from a 2013 CEP and a subsequent review by the EC Directorate-General for International Cooperation and Development (DEVCO). These include recommendations promoting the use of environmentally friendly agricultural practices (such as conservation agriculture, integrated pest management, soil conservation techniques, organic fertilisers and agroforestry), awareness raising and training in the use of agrochemical products, introducing climate change adaptation measures and strengthening the network of agricultural schools. According to the programme, one of the two objectives of sector support is 'To improve the resilience of the most vulnerable geographic areas through agricultural activities that are both environmentally sustainable and profitable'. One of the three expected results of sector support is that 'The welfare of farming households will have been improved in priority areas thanks to the adoption of sustainable and climate-resilient agro-forestry systems'. Two indicators monitored for the sector broadly relate to the environment: number of new hectares of family farming using sustainable practices; and number of farmers with access to agricultural extension services, with a focus on sustainable farming. These indicators are not entirely satisfactory, however, as 'sustainable practices/farming' is not clearly defined, and neither are the parameters by which this is to be measured.

Sources: EEAS and DEVCO, 2014; Palerm et al., 2013.

- **Communicate and raise awareness** (e.g. through television and radio campaigns).

Mainstreaming action: **Identify the specific environment/climate change assessment tools to be applied during identification and formulation and/or implementation.**

Three tools are available to analyse in detail the relationships between a programme/project and environment and climate change: strategic environmental assessment (SEA; applicable to policies and plans or to programmes and projects that provide strategic-level

support), an environmental impact assessment (EIA; applicable to projects) and a climate risk assessment (CRA; applicable to projects).

A note of explanation about strategic-level projects: Often, interventions based on the project modality provide sector support at a strategic level, e.g. through the development of sector policies and plans, enhancement of the sector's institutional set-up and regulatory framework, or support for multiple infrastructure investments. In such cases, an SEA is the relevant tool for mainstreaming environment and climate change.

These tools help analyse the potential impacts of implementing a programme/project on environment and climate and on climate change vulnerability, as well as its exposure and vulnerability to the effects of environmental degradation and climate change. They also help in identifying environmentally friendly options and appropriate measures to minimise risks and impacts and to make best use of opportunities.

Based on the objectives and expected results of EU cooperation in the selected focal sectors, and taking into account the anticipated aid modalities (project and/or programme-based/strategic-level support), conduct preliminary screening in accordance with the process described in Annex 3 of the Guidelines. Either:

- include a commitment in the MIP to undertake an SEA, EIA and/or CRA; or
- if at this stage it looks like no such assessment will be required, provide a justification to this effect (e.g. the existence of a reasonably recent and up-to-date SEA carried out by the government, the EU and/or other donors).

Mainstreaming action: Include indicators in the programming document that capture key environmental and climate change concerns.

The United Nations has developed a detailed set of targets and indicators for the SDGs, some of which will be directly relevant for EU-supported policies, plans and programmes within agriculture, food security and rural development. The EC Directorate-General for International Cooperation and Development (DEVCO) has developed an EU Results Framework (EC, 2015) as well as Sector Indicator Guidance for Programming (EC, 2013c), which provides a list of indicators that can be used in each sector, including environment and climate change–relevant indicators for the agriculture, food security and rural development sector. See Box 3 for examples drawn from DEVCO.

Entry point: Policy dialogue

Mainstreaming action: Include environment and climate change in the policy dialogue agenda, and engage government and key stakeholders including civil society.

Policy dialogue is relevant throughout the programme and project cycle. A clear, simple and realistic agenda for policy dialogue that aims to advance mainstreaming in the agriculture, food security and rural development sector will emerge from the country analysis and from engagement with key stakeholders at programming and at all subsequent phases as experience is gained and issues arise. In the agriculture sector, this engagement will include many actors along the value chain such as farmer organisations and agribusiness

BOX 3 Examples of environment and climate change indicators for rural development, sustainable agriculture, food and nutrition security in country programming

- Percentage change of land under sustainable agriculture
- Percentage of land classified as degraded
- Losses in agricultural productivity (i.e. ratio of agricultural outputs to inputs) due to environmental degradation (soil erosion or desertification)
- Agriculture-related GHG emissions (carbon dioxide–equivalent tonnes/year)
- Intensity of use of water in agriculture (hl/output unit or gross domestic product)
- Intensity of pesticide and fertiliser use (kg/output unit or gross domestic product)
- Share of area occupied by organic farming in total utilised agricultural area

associations, relevant ministries as well as regulator bodies such as environmental agencies.

Identification and formulation

Mainstreaming is especially important during identification and formulation. The identification of a programme/project begins with an analysis of the situation, which should cover environmental and climate-related concerns and opportunities. Formulation fleshes out the programme/project design, which must include measures to minimise environmental impacts and climatic risks and make best use of opportunities to enhance the state of the environment and contribute to low-carbon, climate-resilient development.

Figure 1 presents a decision tree showing the sequence of decision-making for mainstreaming during this phase from problem analysis, through screening and assessment, to action formulation.

Entry point: Problem analysis

Mainstreaming action: **Ensure the problem analysis identifies environment and climate change issues.**

Part 4 provides some insight into the environmental and climate change risks and opportunities in the agriculture, food security and rural development sector. These issues and linkages can also be identified by reviewing certain key documents.

- **Policy documents** — such as sector policies, strategies and plans for environment, climate change, agriculture, food security and rural development — may provide an overview of environmental and climate change challenges in the country with regard to the sector. They may also include specific environmental protection and climate change adaptation/mitigation objectives or measures relevant to the sector (e.g. commitments to reduce deforestation/land conversion, targets for increasing the share of land under sustainable agricultural practices, targets for increasing the area under irrigation, targets for reducing emissions from livestock).
- The **national communications to the UNFCCC** provide an overview of the country's vulnerability to climate change including in the agriculture, food security and rural development sector. The INDCs set country objectives in the fight against climate change. Similarly, national reports to the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD) provide overviews of important environmental issues (respectively, biodiversity and land degradation) which are closely related to agriculture and rural development.

See Part 5 for additional documents with useful information and analyses.

Because the identification of programmes and projects is undertaken in close coordination with the partner government, ensure that environmental and climate change aspects are addressed through policy dialogue (see Box 1).

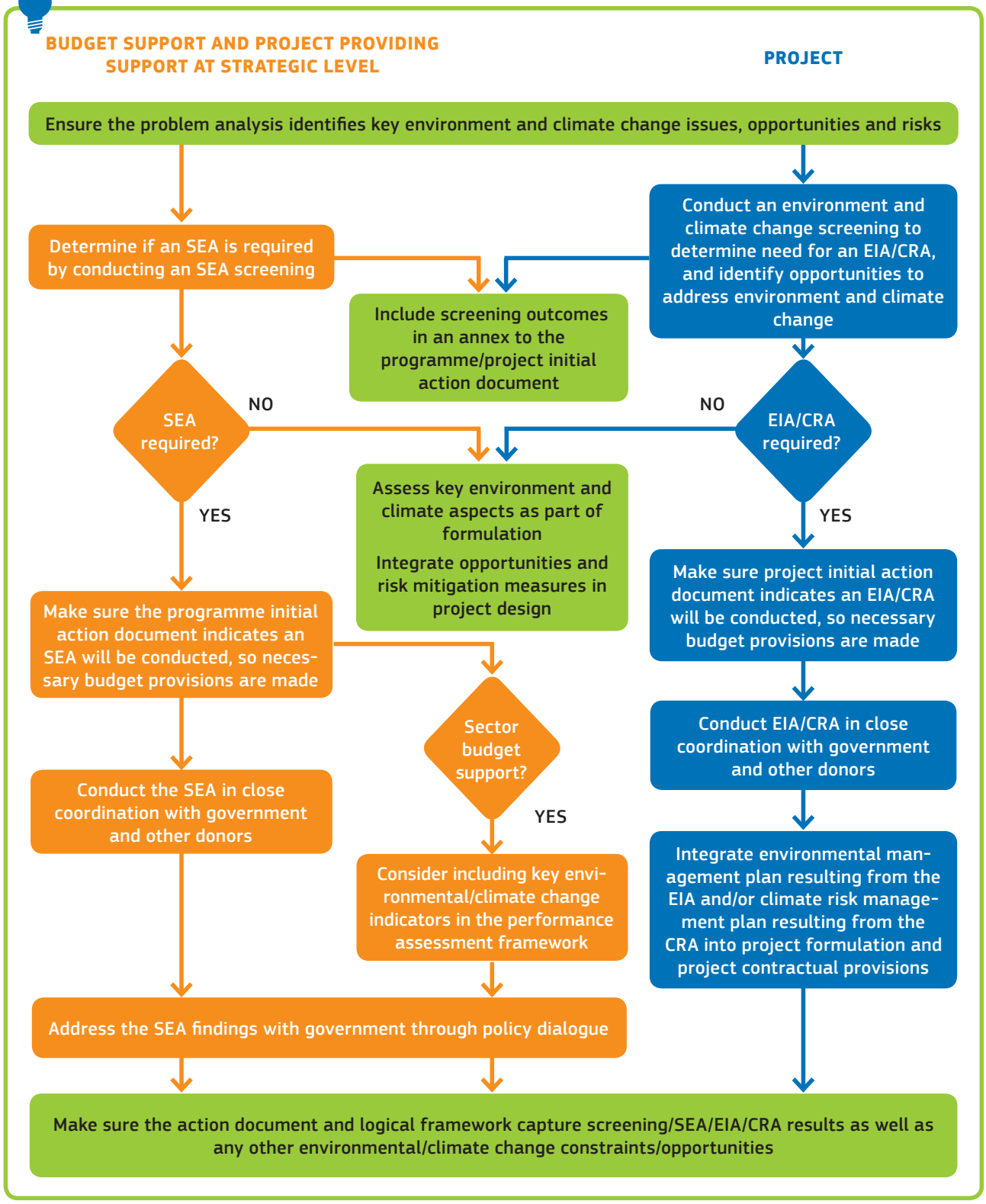
Entry point: Environmental and climate change screenings and assessments

Mainstreaming action: **Undertake environmental and climate change risk screenings to determine if the programme/project is environmentally or climatically sensitive, thus requiring a detailed assessment.**

An environment and climate change screening is required for all actions at the identification stage.

The formulation phase involves fleshing out the programme/project as well as analysing its feasibility. Environmental and climatic factors may compromise this feasibility and thus deserve careful attention. In the case of **more environmentally and/or climatically sensitive interventions**, SEAs (for programmes or projects that provide strategic-level support) and EIAs and CRAs (for projects) can be used to help explore linkages to environment/climate change; identify appropriate measures to address them; and guide decision-making to policies or technologies that contribute to low-carbon, environmentally sustainable development.

FIGURE 1 **Steps during identification and formulation**



Note: An SEA is normally required for support programmes in the agriculture, food security and rural development sector.

The need for undertaking a dedicated EIA or CRA is determined by a screening process described in Annex 3 of the Guidelines. For projects, the need for an EIA is usually determined by national legislation. Screening should be carried out during the identification phase (if not before); the actual SEA, EIA and/or CRA is ideally prepared during formulation. (It may also be undertaken during implementation, with a view — especially in the case of an SEA — to improving implementation and/or informing the next phases or future policies.) If no ad hoc study is required, screening will help identify issues and opportunities to consider in the identification and formulation studies. The summary of the screening process must be submitted together with the initial action document to the quality support group. Box 4 provides an example of the use of an SEA during the programme formulation or, where relevant, later phase.

Entry point: Preparation of the action document

Mainstreaming action: Ensure that environmental and climate change concerns and opportunities are reflected in programme/project specifications, necessary budget provisions are made and relevant indicators are included.

Environmental and climate-related considerations identified in the context of problem analysis and screening and through specific assessments need to be reflected in programme/project objectives, expected results, indicators (see Box 5 for examples of relevant indicators) and/or activities, as appropriate. For specific suggestions on opportunities for mainstreaming environment and climate change which can be reflected in sector programme/project objectives and activities, see Part 4.

Even in the case of programmes and projects that do not require an SEA, EIA or CRA (either because they are less sensitive or because their scale is insufficient to justify undertaking a dedicated assessment), environment and climate change should be considered. The Guidelines (Annex 4) provide specific guidance on integrating related considerations into formulation studies.

Budget allocations for the programme/project should take into consideration any additional costs that pertain to environmental and climate change mainstreaming (e.g. for conducting further assessments as part of programme/project implementation, for implementing an environmental management plan, or for undertaking specific climate change adaptation measures). The tools and opportunities for mainstreaming

BOX 4 Case study: National Sugar Adaptation Strategy, Kenya

The Government of Kenya and stakeholders in the sugar industry have been implementing the National Sugar Adaptation Strategy with support from the Accompanying Measures for Sugar Protocol Countries since 2007. The strategy aims at rehabilitating the sugar sector to improve its productivity and competitiveness. In 2012, the EU financed an SEA of the strategy.

The SEA carried out a baseline study, then examined the potential positive and negative environmental impacts of the strategy along biological, physical environment, socio-cultural and socio-economic dimensions. The SEA then analysed four scenarios for the sugar sector: business as usual (the zero alternative), full strategy implementation, irrigation for smallholders in Western Kenya, and establishment of a large-scale irrigated nucleus estate. The potential environmental, social and economic impacts of each scenario were analysed.

The SEA also provided an environmental management and monitoring plan with specific recommendations and indicators. The institutional capacity of the key sector stakeholders (public and private) to implement the plan was assessed. Throughout, extensive stakeholder consultations were conducted.

The EU Delegation found the SEA to be very useful, and the findings were discussed with and approved by all key sector stakeholders. Moreover, some of the SEA findings guided formulation of the EU sector support programme.

Unfortunately, implementation of the recommendations in the SEA environmental management and monitoring plan has been limited. Implementation of the National Sugar Adaptation Strategy also has made only limited progress to date due to institutional constraints and restructuring.

Sources: ECORYS, 2014; PEMconsult and Particip, 2012; EU Delegation staff.

BOX 5 Examples of environment and climate change indicators for monitoring performance of sector programmes and projects

- Climate change impact and vulnerability assessment completed and adaptation strategy for agriculture sector developed
- Number of extension workers trained in climate change adaptation, integrated pest management, integrated soil and water conservation
- Standards and/or guidelines for sustainable aquaculture/fisheries developed and approved
- Number of target farmers trained in sustainable crop and land management practices
- Arable land under functional soil protection measures
- Number of farmers using organic farming/conservation agriculture techniques
- Development and implementation of sustainable pasture management system
- Area (number of hectares) under drip irrigation or other water-efficient irrigation systems
- Proportion of farmers' households that have applied and retained new, more sustainable and climate-resilient technology or management, disaggregated by gender

BOX 6 Mainstreaming and budget support

The selection and use of appropriate indicators comprise the main avenue for mainstreaming in budget support. Indicator selection is critical under budget support, as the sector performance assessment framework is the primary tool available to the EC to ensure the support it provides is delivering results. If there are any key environmental and/or climate change concerns associated with the sector (e.g. as informed by an SEA), the performance assessment framework should include indicators that capture such concerns, e.g. in relation to variable tranches.

Other mainstreaming options in relation to budget support are to include discussions on environment and climate change matters in sector policy dialogue (see Box 1), and support capacity development for national stakeholders on mainstreaming.

Further guidance on mainstreaming under budget support is provided in Section 3 of the Guidelines.

environment and climate change in budget support programmes differ from those typically used in the case of projects. Box 6 provides a brief description of the key mainstreaming approaches available.

Mainstreaming action: **Assess whether the action requires a Rio or aid to environment marker and contributes to climate change or biodiversity financing.**

On the cover page of the action document, policy markers — including Rio convention markers — must be selected to support statistical reporting by the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD). The Rio markers were developed to measure the contribution of donors to fulfilling their pledges at the Rio Conference of 1992. The EU uses Rio markers to track financial contributions to biodiversity, desertification and climate change (both mitigation and adaptation). Markers should be selected consistently and rigorously. If a theme is marked as either a significant programme/project objective (marker value = 1) or a principal programme/project objective (marker value = 2), 40% or 100%, respectively, of the action's budget is accounted for as relevant to the theme. Annex 8 of the Guidelines provides detailed information on Rio markers and their use.

In agriculture sector interventions that promote climate-smart agricultural practices in the context of a changing climate, the **climate change adaptation marker** (one of the Rio markers) and the **aid to environment policy marker** would be justified. A climate change mitigation marker may also be justified when measures are expected to decrease GHG emissions or increase carbon sequestration through changes in farming methods. The OECD DAC's 'Indicative table to guide Rio marking by sector/sub-sector: Climate change adaptation and climate change mitigation' provides the rationale for attributing a climate marker and examples of qualifying activities in various sectors, including agriculture (OECD DAC, n.d.).

The OECD DAC's statistical reporting directives specify that an activity arising from a national action plan linked to a Rio convention — such as national adaptation programmes of action (NAPAs), national adaptation plans (NAPs), nationally appropriate mitigation actions (NAMAs) and (I)NDCs — 'automatically qualifies as principal objective, as the Conventions provide the motivation for the design of the activity' (OECD DAC, n.d., p. 8).

Implementation

During implementation, the programme/project has to be steered and monitored to ensure it does not cause harmful environmental and climate impacts and that its results are not jeopardised by climate change or environmental degradation — and to enable appropriate remedial action to be taken as necessary. During this phase, strategic or technological options can be chosen and new activities or measures identified to further enhance positive environmental and climate impacts. New opportunities to strengthen environmental and climate-related performance will arise throughout implementation, e.g. by promoting agroforestry instead of relying on mono-cropping or using solar drying techniques for post-harvest processing.

Entry point: Preparation of contractual documents

Mainstreaming action: Further integrate environmental and climate change considerations and incorporate environmental management plan/climate risk management plan and other measures into contracts/agreements.

Where substantive and sufficient mainstreaming has occurred during identification and formulation, implementation translates these intentions into concrete action. During this phase, it is essential to (i) track the relevant measures that were integrated in the programme/project design; (ii) promote environmental sustainability in contract specifications; and (iii) when dealing with a project that was subject to an EIA or a CRA, make sure the corresponding environmental management plan (EMP) and/or climate risk management plan (CRMP) is implemented and monitored. This tracking should be integrated into the action's overall monitoring system.

The EMP prepared as part of an EIA specifies how the mitigation measures identified will be implemented (by whom, when, where) and how these will be monitored to verify their effectiveness to contain adverse environmental impacts. The CRMP prepared as part of a CRA identifies the actions needed to implement the CRA recommendations in the form of an operational plan. EMP/CRMP recommendations need to be incorporated in the contractual documents linked to project implementation (e.g. for construction works).

For ongoing programmes/projects where environment and climate change were not integrated at all or sufficiently into the design, options still exist for enhancing their environmental and climate performance. Existing activities can be assessed to identify opportunities for improving their environmental and climate change performance, and activities reoriented or complemented accordingly. See Box 7 for opportunities specific to the agriculture, food security and rural development sector.

Entry point: Monitoring and steering mechanisms

Mainstreaming action: Ensure relevant environmental and climate change indicators are included in the action's monitoring system, plans and reports, results-oriented monitoring and other reviews (e.g. joint sector or budget support reviews), and ensure environmental and climate change results are regularly discussed by relevant stakeholders and the steering body.

Programme/project monitoring should include appropriate indicators that can (i) help identify if key environmental and climate change concerns and opportunities are being addressed; (ii) track the efficiency and effectiveness of mainstreaming measures; and (iii) allow prompt identification of adverse environmental impacts that may arise, thereby enabling the programme/project to be adapted or revised accordingly. The participation of relevant stakeholders during monitoring should be encouraged. Box 3 gives examples of indicators relevant for the agriculture, food security and rural development sector.

BOX 7 Examples of mainstreaming opportunities in an ongoing programme/project

Programme/project activities:

- Promote policy dialogue or exchange of experiences among stakeholders on policies in sustainable agriculture, food security and rural development
- Screen agricultural practices and inputs for their environmental performance and select those with a lower environmental and carbon footprint

Programme management and operations:

- Adopt a green procurement policy (e.g. use lowest complete life-cycle costs rather than lowest capital costs to compare tender prices; purchase/use fuel-efficient vehicles, energy-efficient lighting and appliances, recycled/Forest Stewardship Council (FSC) certified paper, FSC certified or Forest Law Enforcement, Governance and Trade (FLEGT) licensed wood for construction, biodegradable cleaning products, recycling and waste sorting)
- Raise awareness and promote energy efficiency and sustainable consumption and production (e.g. solar power and agroforestry)
- Promote supply of goods and services from the local community/train community members to be able to deliver quality goods and services, e.g. to reduce carbon footprint from transport and shipping of imported goods

Building on the monitoring and results reporting, regularly assess the situation with regard to the four objectives in Table 1. Depending on the programme/project stage of implementation, a more in-depth assessment can be done as part of the mid-term evaluation, which offers a unique opportunity for reorienting a programme/project if needed (see below); as part of a results-oriented monitoring mission; or through independent assessment of the programme/project environmental footprint. The findings may indicate a need to reorient existing activities, add some complementary activities, and/or add environmental and climate change–related indicators to the monitoring system.

Box 8 provides an example of environmental and climate change mainstreaming in the implementation of a rural development project.

Evaluation

The evaluation phase looks at the relevance, effectiveness, efficiency, impact and sustainability of the programme/project, so as to draw lessons to inform the next cycle of operations. There are two main points at which evaluation takes place: during the **mid-term review** and at the end of a programme/project. The mid-term evaluation results inform the continuation of the programme/project; the **final evaluation** results inform the next programming period.

Entry point: Mid-term and final evaluations

Mainstreaming action: **Ensure the evaluation criteria selected capture the key environmental and climate change concerns.**

The indicators suggested in Boxes 3 and 5 for incorporation in the programming document and the logical framework or performance assessment framework can be useful in evaluation. Evaluation can also address the following environmental and climate change–related aspects:

- whether an SEA, EIA and/or CRA was required and, if so, whether it was carried out
- whether and to what extent the environment and climate change–related measures recommended (e.g. by the policy or project document, SEAs, EIAs, CRAs or mid-term evaluations) were implemented — and, if so, how successfully
- whether the programme/project has addressed the environmental/climate change issues in a **relevant** manner (e.g. the most important environmental issues and options were identified in the problem analysis and activities were appropriately designed to address them)
- whether programme/project actions were **effective** in promoting environment-friendly and climate-resilient practices (e.g. successful introduction of integrated pest management or water harvesting)

BOX 8 Case study: Mainstreaming at the local level in Tanzania

In 2011–2014, the Global Climate Change Alliance (GCCA) supported the establishment of three ecovillages, where a multidimensional, integrated approach 'touching almost every aspect of village life' was used for climate change adaptation and mitigation at the local level. A set of interventions was implemented, which not only promoted a range of environmentally sustainable practices, but also enhanced and diversified incomes, food security and access to water for domestic purposes. These innovations involved the following areas.

- **Crops.** Several improved practices were introduced to increase soil fertility and crop yields and reduce vulnerability to climate variability. These practices included later planting to avoid crop losses during dry spells; ox-drawn ripping to break the hard-pans in soil and increase water retention and reduce the workload for land preparation; soil-water conservation measures such as contour ridges and gully restoration; the use of farmyard manure to increase soil fertility and improve the soil structure; open pollinated high-yielding and early-maturing crop varieties and community seed production; optimal spacing of plants; inter-cropping with legumes to improve soil fertility; and crop rotation to control weeds and pests. Yields increased significantly as a result of these techniques.
- **Livestock.** Improved practices were introduced to increase productivity, reduce the negative environmental impact of livestock grazing and enhance synergies between livestock and crop production. For example, improved cattle, goat and chicken breeds were cross-bred with local breeds to increase productivity while maintaining adaptability to local conditions; training was conducted on animal husbandry and dry season feeding; modern beehives and bee keeping were introduced to increase productivity; fish ponds were established; and training was conducted on tanning and production of leather goods to add value and generate incomes.
- **Water.** The domestic and livestock water supply was enhanced through water pumps powered by solar energy, rooftop rainwater harvesting, a subsurface dam, and a sand dam to capture and store seasonal rains.
- **Natural resources management.** Nursery establishment, tree planting (including fruit trees) and land use planning (with by-laws) were introduced to counter soil erosion and maintain the supply of forest products, while simultaneously storing carbon.
- **Rural energy.** Alternative energy and energy-efficiency innovations were introduced to reduce reliance on fuelwood and charcoal, deforestation and thereby GHG emissions. These measures included energy-saving cooking stoves, solar panels and biodigesters to convert dung into gas.

Source: Chololo Ecovillage Project, 2014.

- whether the programme/project made environmentally **efficient** use of means (e.g. minimising the use of polluting agrochemicals and water)
- whether the programme/project has had any **positive impact** by contributing to sustainable development, including environmental sustainability, low-carbon development and climate resilience (e.g. restored soil productivity, increased farmer income as a result of accessing organic markets, reduced carbon emissions, increased carbon sequestration)
- whether the programme/project has had a direct or indirect **negative impact** on the environment and climate resilience (e.g. increased profitability and intensification of agriculture leading to increased clearance of natural vegetation such as forest or mangrove, and pressure on water resources)
- whether the programme/project's **sustainability** is threatened by environmental degradation and/or climate change (e.g. that the agricultural commodities promoted by a project cannot be produced in the future due to reduced water availability or higher temperatures)

To ensure the above points are adequately addressed in evaluations, (i) environment and climate change–related key points should be clearly reflected in the evaluation terms of reference, and (ii) the evaluation team should have relevant environment and climate change expertise. Experience shows that if these factors are lacking, evaluation coverage of environment and climate change aspects tends to be shallow and unlikely to adequately capture associated issues and opportunities.

Mainstreaming action: **Ensure the evaluation results inform continuation of the programme/project and of future programmes/projects.**

The results of the **mid-term evaluation** should be discussed and necessary changes integrated in the programme/project to enhance its environmental and climate change performance. Lessons from the **final evaluation** regarding environmental and climate change performance should be drawn and disseminated to inform the design of future programmes/projects. Moreover, evaluation results can inform policy dialogue.

Box 9 provides an example of a country programme evaluation which assessed the environmental performance of cooperation in the agriculture, food security and rural development sector.

BOX 9 Case study: Evaluation of EU cooperation with Kenya

In early 2014, the DEVCO Evaluation Unit commissioned an evaluation of EU cooperation with Kenya. The methodology used was a cascading one, with 10 evaluation questions defining the areas to be assessed. Each evaluation question was supported by two to four judgement criteria, which in turn were each informed by two to four indicators.

One question focused on the agriculture sector: 'To what extent did the EU support to the agricultural sector contribute to improved food security, in particular for ASAL [arid and semi-arid lands] areas?' Three judgement criteria were associated with this question, one of which focused on the environment and climate change: 'Environmental and climate change problems are adequately addressed through the various EU interventions in the ASAL areas as a result of EU support'. This judgement criterion was informed by three indicators: (i) more environmental measures taken by rural households that have resulted in increasing resilience; (ii) indications of change of agricultural and other land use practices (including drought management) because of environmental considerations (reforestation and watershed management); and (iii) the extent to which newly introduced environmental and agricultural practices proved to be sustainable.

The environmental and climate change performance of EU support to the agriculture sector was evaluated along the above indicators. The assessment resulted in a recommendation for continued support and strengthening of the index-based livestock insurance programme, as it provided income security for livestock producers in case of loss of livestock due to drought; it was recommended that the insurance scheme be strengthened by ensuring strict monitoring and enforcement of rules to prevent abuse, and to stimulate producers to invest in animal health care and additional feed.

Source: ECORYS, 2014.

Part 4: Environment and climate change risks, hazards and opportunities for sector activities

A. CROP PRODUCTION		
Areas of intervention	• Cultivation of staple crops/grains • Irrigation • Horticulture • Tree/perennial crops (e.g. orchards, tea/coffee plantations, cocoa)	
	WHAT THEY ARE	**HOW TO ADDRESS/AVOID/MINIMISE**
Key risks and hazards	• Declining yields due to erosion/ declining fertility • Declining water availability for irrigation due to hydrological disruption and saltwater intrusion (e.g. associated with deforestation and climate change) • Pest outbreaks (e.g. insects) due to loss of natural predators and climate change • Crop loss due to increasing frequency and magnitude of extreme weather events (e.g. drought, dry spells, floods) due to climate change • Reduced agricultural productivity due to long-term change in local climate (e.g. drier, hotter climate; shorter, more unpredictable/erratic rainy seasons)	• Restore **soil fertility**; options include: – erosion control, e.g. gabions, terracing, tree barriers – mulching – organic manure – promotion of farmer investments in soil conservation, e.g. by providing food for work or social transfers as investment incentives • Promote **water-efficient irrigation** to increase crop yields and contribute to climate change adaptation; options include: – small-scale infrastructure for water management such as **rainwater harvesting** and **small earth dams**; methods of water capture must be carefully studied for their environmental and health effects – **drip and sprinkler irrigation** and other low-water-consumption irrigation – **incentives and charges** to promote water savings, metering, communal management through water user associations • Based on an understanding of the potential impacts of climate change on the sector, support the development of approaches to modify **farming practices**; options include: – research on and implementation of changes in **farming calendar** – research on and **introduction of viable crops** – research on **pest and disease dynamics** expected under climate change – research, development and introduction of drought-resistant **crop varieties** – **extension training** on climate change adaptation • Support **awareness raising of farmers** on climate change and adaptation through e.g. extension services, farmer field schools, radio programmes • Take into account medium- and long-term climatic conditions expected under climate change in the design of **drainage systems**, which may otherwise become obsolete before their projected lifespan • When planning agricultural expansion, identify **sustainable water abstraction** rates considering other competing water uses and climate change projections; also take into account saltwater intrusion associated with sea level rise which can be exacerbated by groundwater abstraction

A. CROP PRODUCTION

	WHAT THEY ARE	HOW TO ADDRESS/AVOID/MINIMISE
Potential impacts of sector development	• Erosion and declining soil fertility from cultivation of slopes, tillage, uncovered soils after harvest and mono-cropping • Deforestation and loss of wildlife and biodiversity from conversion of forests, wetlands and other natural vegetation to agriculture • Soil and water pollution, eutrophication and loss of biodiversity and soil fauna due to use of pesticides and fertilisers • Disruption of hydrological flows and water bodies due to clearance of vegetation in upper catchments and over-abstraction of surface and groundwater for irrigation • Air pollution from burning of biomass due to land clearance and burning of crop residues • Loss of biodiversity due to introduction of alien invasive species • Soil salinisation due to accumulation of salts from irrigation water • GHG emissions from: – clearing forests – burning crop residues and vegetation – methane emissions from paddy rice – fertiliser production	• Addressing land degradation through the promotion of **soil and water conservation** helps in tackling underlying causes of reduced productivity, contributes to climate change adaptation and can create carbon sinks through re-vegetation; options include: – **agroforestry** – **conservation agriculture** (following the principles of permanent soil cover, minimal soil disturbance and crop rotation) – **soil erosion control measures** (e.g. terracing) – **extension training** on the above approaches and techniques • Promote integrated **soil and nutrient management** to minimise fertiliser use, contributing to reduced water contamination as well as to climate change mitigation; options include: – **inter-cropping** with nitrogen-fixating plants – **composting** manure and crop residues – site-specific **research on nutrient needs**; matching fertiliser application to soil nutrient needs • **Rehabilitate drainage systems** to minimise soil salinisation associated with water logging • Promote **integrated pest management**, reducing the need for synthetic pesticides and increasing climate change adaptive capacity • **Improve fertiliser efficiency**, including analysis of soil nutrient needs to optimise use of fertilisers, training in correct application of fertilisers • **Minimise water contamination and occupational health hazards** by training farmers in the correct use of agrochemical products and product selection • **Minimise field burning practices** such as sugar cane burning, as they can be a source of persistent organic pollutants (POPs, which are regulated under the Stockholm Convention) and a health hazard
Opportunities	• Improving land use and promoting **sustainable cropping practices** such as agroforestry and conservation agriculture generate multiple benefits in terms of food security, livelihoods, resilience, economic development and ecosystem services (e.g. carbon sequestration, soil protection) • Promote **organic farming**, which can **access high-value markets** and contribute to reducing water pollution; reduced reliance on inorganic fertilisers also reduces vulnerability to fluctuations in world market input prices and contributes to climate change mitigation • Promote **fair trade certifications**, which can access high-value markets, reduce pollution and secure premiums that benefit the community • **Generate heat and electricity** from agricultural waste, contributing to low-carbon development (conditions permitting) • **Improve storage and on-farm processing** to reduce post-harvest losses	

B. LIVESTOCK		
Areas of intervention	• Livestock breeding • Rangeland management • Poultry production	
	WHAT THEY ARE	**HOW TO ADDRESS/AVOID/MINIMISE**
Key risks and hazards	• Loss of livestock due to increasing frequency and magnitude of extreme weather events (e.g. drought, dry spells, cold spells, floods) due to climate change • Reduced productive potential and carrying capacity of rangelands due to erosion, declining soil fertility and long-term change in local climate (e.g. drier, hotter climate; shorter, more unpredictable/erratic rainy seasons) • Onset of new diseases/increased frequency of known diseases due to climate change • Competition with agriculture leading to reduced availability of rangeland and increased pressure on remaining grazing lands	• **Restoration of grazing lands**; options include: – erosion control, e.g. gabions, terracing, tree barriers – enrichment planting – grazing control, e.g. restricted access to ensure grazing is not exceeding carrying capacity, periodic bans on grazing to allow regeneration – increasing the number of watering points to reduce pressure on vegetation near water sources during the dry season – destocking • Reduce the imperative to maintain large herds by **enhancing productivity per animal**: – improve animal husbandry and veterinary services to improve livestock health and reduce livestock losses – introduce improved breeds with higher productivity, which are adapted to local conditions • Develop **climate change adaptation mechanisms** such as creation of high grounds to protect livestock from floods, preparedness for new diseases and changes in known disease dynamics
Potential impacts of sector development	• Deforestation and loss of wildlife and biodiversity from conversion of forests and other natural vegetation to pastures • Erosion and loss of soil fertility due to overgrazing • Pollution of water bodies and groundwater and transfer of diseases from animal waste • GHG emissions from: – clearing forests – burning pastures – methane emissions from ruminant metabolism	• Develop **grazing land management systems** to keep pastures under their carrying capacities (e.g. geographic information system (GIS) –based systems, grazing fees, community-based regulation of access) • Establish **additional watering points** to reduce concentration of livestock around water sources • Enrichment **planting** in grazing land • **Reverse pasture degradation and protect pastures** (e.g. removing mobility on common pastures, controlled exclusion from sensitive areas), which also leads to reduced carbon emissions • Promote **silvopastoralism**, which can have benefits in enhancing soil protection and water conservation and generating carbon sinks • Promote **improved diets to reduce enteric fermentation**, contributing to reduced GHG emissions • Promote the production of **climate-smart alternative protein sources to meat from cattle**
Opportunities	• Improving land use and promoting **sustainable livestock and rangeland management systems** generate multiple benefits in terms of food security, livelihoods, resilience, economic development and ecosystem services (e.g. carbon sequestration, soil protection) • Promote **organic meat**, which can **access high-value markets** and contribute to reduced water pollution	

C. AQUACULTURE AND FISHERIES

Areas of intervention	• Marine fisheries • Inland fisheries • Aquaculture	
	WHAT THEY ARE	**HOW TO ADDRESS/AVOID/MINIMISE**
Key risks and hazards	• Loss of marine fish stock and biodiversity, e.g. due to: – destruction of coastal and marine habitats linked to the development of various activities (extraction industries, tourism, urban development, etc.) – clearance of mangroves (fish spawning grounds) – coral bleaching due to acidification of oceans (fish spawning grounds) – changing oceanic currents and water temperatures resulting in decreasing primary production and changes in fish distributions – destruction of coral reefs and coastal habitats due to rapid sea level rise – invasive species • Loss of freshwater fish resources due to disruption of freshwater ecosystems from: – dam construction – water pollution – siltation/increased turbidity from erosion and mining – water abstraction for agriculture, industrial and urban domestic use – disruption to hydrological flows and freshwater systems due to changing weather patterns – changing water temperatures and deoxygenation – invasive species	• Promote **integrated water resources management** • **Rehabilitate** water courses • Establish **fish ladders** in connection with dams to allow migration • Establish **captive breeding programmes** • Promote **mangrove and coral reef rehabilitation and protection** to protect fish spawning grounds; this will have co-benefits for climate change adaptation (e.g. natural sea defences to sea level rise and storm surges), climate change mitigation (creation/protection of carbon sinks) and biodiversity • Engage in a **dialogue with other sectors** to address the risks and hazards created by actions in these sectors for fisheries • Integrate **climate change adaptation** in fisheries and aquaculture policies
Potential impacts of sector development	• Collapse of fish stocks from overfishing; illegal, unreported and unregulated fishing; and destructive fishing practices • Pollution of downstream water bodies and groundwater and transfer of diseases due to release of wastewater from aquaculture • Loss of aquatic biodiversity due to introduction of invasive fish and shellfish species and diseases transferred from farmed fish • Pressure on wild fish populations as fishmeal/fish oil is made with wild-caught fish • GHG emissions from energy consumption in aquaculture by fishing vessels and in post-harvest distribution and markets	• Promote **ecosystem approaches** to fisheries (EAF) and to aquaculture (EAA) • **Raise awareness on the impacts of capture techniques** • Invest in **enforcement of fishing regulations** • Promote agroecological models of aquaculture — e.g. **aquaculture in rice farming** as part of an integrated pest management approach and a way to reduce use of agrochemicals; **aquasilviculture** can also be promoted, integrating aquaculture and mangrove forestry, which sequesters carbon and is more resilient to shocks and extreme events (FAO, 2013) • Promote **energy-efficient, low-trophic aquaculture** (e.g. farming of seaweed, oysters and clams or herbivorous species), which has a relatively low carbon footprint
Opportunities	• Promote **organic production and ecolabelling of aquaculture products**, which can (potentially) access high-value markets and contribute to reduced impact on ecosystems • Promote **ecolabelling of fish**, which can potentially **access high-value markets** and contribute to reduced pressure on fish stocks and promote more sustainable fishing practices	

D. CROSS-SECTORAL		
Areas of intervention	• Agriculture, food security and rural development policy • Extension services • Off-farm livelihood activities • Employment generation and entrepreneurship • Agro-industries • Fiscal reform	
	WHAT THEY ARE	**HOW TO ADDRESS/AVOID/MINIMISE**
Key risks and hazards	• As listed in the preceding tables • Loss of off-farm income opportunities, due to environmental degradation and climate change, e.g. loss of forest resources	• When promoting agro-industrial development, promote the use of **clean technologies** and **low-carbon processes** including reuse of water and wastewater treatment, etc. • Support **climate change impact and vulnerability assessments** in the agriculture sector (including crops, livestock and aquaculture/fisheries) to understand the risks and opportunities and develop adequate strategies for adaptation • Promote **risk transfer** through the development of weather insurance, increasing climate change adaptive capacity and social transfers/food • Invest in enhancing **early warning systems** (seasonal forecasts, yield predictions, drought warning, climate modelling) to help avert crises and allow for prompt action
Potential impacts of sector development	• Policies can incentivise and promote practices which lead to environmental degradation and/or vulnerability to climate change (e.g. incentives for land clearance, promoting colonisation of virgin lands, subsidies on pesticides and inorganic fertilisers) • GHG emissions from: – energy consumption in industrial processing – charcoal burning	• Review policies and (i) introduce **incentives (e.g. fiscal mechanisms) for environmentally sustainable and climate-smart practices and inputs** (e.g. less-polluting pesticides, improved seeds, secure land rights to promote investments in land productivity and restoration); (ii) **remove incentives which promote unsustainable practices** or hamper the adoption of sustainable and climate-smart practices; and (iii) **reduce/remove subsidies which result in polluting practices** (e.g. for fossil fuels, inorganic fertilisers), while addressing associated socio-economic impacts (e.g. via cash transfers) • Develop **regulatory framework** to control clearing of new land and water abstraction • Include **environmental and climate indicators** in sector monitoring • Include **environmental and climate change actions and items** in sector plans and budgets • Build **capacity and awareness of the extension system** to promote environmentally sustainable and climate-smart agricultural practices • Promote **integrated systems** which can improve efficiency, as the waste from one system is a resource for the other; examples are **crop-livestock integrated systems** (manure increases crop production and crop residues and by-products feed animals), **rice-fish integrated systems** (which reduce pesticide requirements in rice farming), **agroforestry** (contributes to soil and water conservation; reduces impacts of extreme weather; increases soil fertility; can boost yields; can provide fruit, fodder, timber and fuelwood and acts as a carbon sink) and **silvopastoral systems** • Explore options to build on and strengthen **local/traditional knowledge, technologies and varieties/breeds** adapted to local conditions • Develop adequate strategies for low-carbon development • Climate-proof rural infrastructure (e.g. rural roads, river bank protection, irrigation schemes)
Opportunities	• Seek opportunities for **rural incomes from improving the status and productivity of natural resources**, and **payments for ecosystem services and carbon storage** • Seek opportunities for the creation of off-farm employment and **green jobs**, e.g. in new/emerging green industries in rural areas and ecotourism • Promote markets for **organic products** • Introduce incentives for **cleaner production** in agro-industries (e.g. labels, awards)	

Part 5: Resources

General guidance on mainstreaming

Integrating the environment and climate change into EU international cooperation and development: Towards sustainable development (EC, 2016). Practical guidelines for mainstreaming environment and climate change in EC cooperation and development. Provides model terms of reference for CEPs, SEAs and EIAs; and environmental and climate risk screening procedures.

Global Climate Change Alliance. EU initiative with training materials on climate change mainstreaming.

United Nations Development Programme–United Nations Environment Programme Poverty-Environment Initiative (UNDP-UNEP PEI). EU-supported programme on county-led environmental mainstreaming, which has developed a comprehensive methodology and toolbox on mainstreaming.

Sector-specific guidance and tools

The 2050 Criteria: Guide to Responsible Investment in Agricultural, Forest, and Seafood Commodities (WWF, 2012)

The Adaptation Advantage: The Economic Benefits of Preparing Small-Scale Farmers for Climate Change (International Fund for Agricultural Development, 2013)

Agriculture-based value chain analysis tool (EC, 2011). Within the framework of the Agriculture Financing Initiative (AgriFI) which aims to mobilise additional investment in agriculture-based value chains, this tool provides for evidence-based analysis and monitoring of value chains. One of the four leading questions deals with environmental sustainability, using concepts such as product life cycle, climate change, eco-toxicity, etc.

'Agriculture: Mainstreaming Environment and Climate Change', briefing note (IIED and Irish Aid, 2011)

Climate-Smart Agriculture Sourcebook (Food and Agriculture Organization of the United Nations, 2013)

'Climate Impacts on Food Security and Nutrition', report (Met Office and World Food Programme, 2012)

Climate Change and Hunger, Responding to the Challenge (World Food Programme, 2009)

'Environmental Assessment Guidelines'; see Appendix 1: Rapid Environmental Assessment Checklists for irrigation, fisheries, and agro-industrial projects (Asian Development Bank, 2003)

Environmental Impact Assessment: Guidelines for FAO Field Projects (Food and Agriculture Organization of the United Nations, 2012)

'Organic agriculture: Information note' (EC, 2012)

Web-based resources

Capacity4dev.eu, Agriculture & Rural Development. Knowledge-sharing platform on agriculture and rural development in development cooperation.

CCAFS (Research Program on Climate Change, Agriculture and Food Security)

Climate Smart Agriculture

Conservation Agriculture (Food and Agriculture Organization of the United Nations)

CORDIS (Community Research and Development Information Service). Provides a list of research projects funded under the Seventh Framework Programme for Research and Technological Development (FP7).

The Economics of Ecosystems and Biodiversity (TEEB). EU-supported initiative with resources on mainstreaming of biodiversity. A TEEB study has also been conducted on agriculture and food, highlighting the role and influence of food consumption and production on ecosystems and biodiversity and promoting the exchange of information to gain insight on how best to use economic tools for measuring and managing the impact and opportunities.

Fisheries and Aquaculture and Climate Change (Food and Agriculture Organization of the United Nations)

Food and Nutrition Security (DEVCO)

Livestock and the Environment (Food and Agriculture Organization of the United Nations)

Sustainable Agriculture and Rural Development (DEVCO)

Weather Risk Management Facility (WRMF)

World Agroforestry Centre

Sector SEAs and related guidance

Applying Strategic Environmental Assessment: Good Practice Guidance for Development Co-operation (OECD DAC, 2006). Guidelines prepared in response to commitments under the Paris Declaration for Harmonisation of Donor Approaches to Environmental Assessment. Provide an overview of different approaches to SEA used by donors and basic principles for SEA. Complementing the guidance, Advisory Notes have been prepared on SEA and biofuel development, climate change adaptation, ecosystem services, disaster risk reduction, and post-conflict development.

SEA of the agriculture sector in Rwanda (EC, 2012)

SEA of the agriculture sector in Swaziland (EC, 2016)

SEAs for sugar sector adaptation strategies (an important component of agriculture and rural development) prepared by the EC under the Sugar Accompanying Measures for e.g. Guyana (2013), Jamaica (2009), Kenya (2012), Malawi (2010); Mauritius (2007), Swaziland (2010), Zambia (2010)

Country environment and climate change situation

Country environmental analyses (CEAs). Detailed state of the environment reports prepared by the World Bank for some countries; provide good overview of environmental issues.

Country environmental profiles (CEPs). Prepared in support of EU multiannual programming. Provide an overview of the state of the environment (including pressures and trends); expected impacts of climate change; the institutional, policy and regulatory framework for environment and climate change; donor activity in environment and climate change; and recommendations for EU programming.

Low-emission development strategies (LEDS). National development plans addressing low-emission and/or climate-resilient economic growth. Typically include a compilation of emissions data and projections; economy-wide, broad, long-term mitigation goals (15–30 years); a survey of cost-efficient mitigation options and their prioritisation; and stipulation of concrete short- and medium-term mitigation actions.

National adaptation programmes of action (NAPAs). Produced by all least developed countries (LDCs) and submitted to the UNFCCC, NAPAs identify priority climate change adaptation projects. In many cases, NAPAs are outdated and/or have been replaced with national adaptation plans (NAPs) and/or LEDS.

Nationally appropriate mitigation actions (NAMAs). Prepared in the context of the UNFCCC by developing country parties to the convention, NAMAs identify priority climate change adaptation actions. Discussions are ongoing in climate negotiations to see if NAMAs could qualify for carbon credits under the New Market Mechanisms.

National communications to the UNFCCC. Submitted by all countries that are party to the convention and include an overview of the country situation, expected impacts from climate change, an inventory of GHG emissions, an indication of climate change vulnerabilities in different sectors, and an indication of opportunities for GHG reductions and adaptation.

(Intended) nationally determined contributions (INDCs). INDCs, prepared ahead of or following the Paris Agreement, are to be communicated by all countries party to the UNFCCC. Present each country's ambition for reducing emissions, taking into account domestic circumstances and capabilities. Can also describe climate change impacts and adaptation needs and plans, and what support if any might be needed from the international community. Once a country ratifies the Paris Agreement, its INDC becomes an NDC.

National environmental summaries (NESs). Prepared by the United Nations Environment Programme for some countries. Offer a good synthesis of a country's most important environmental issues.

Other country resources

- National state of the environment reports
- National reports to the Convention on Biological Diversity (CBD)
- National biodiversity strategies and action plans (NBSAPs)
- National reports to the United Nations Convention to Combat Desertification (UNCCD)
- National agriculture, food security and rural development policies
- National environment policy
- National water policy
- National land use policy/plan
- National climate change policy
- National energy policy
- Any SEA carried out in the sector
- Research, evaluations and analysis produced by other donors in the energy, environment and climate change sectors

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Acronyms

CEP	Country Environmental Profile
CRA	Climate Risk Assessment
CRMP	Climate Risk Management Plan
DAC	Development Assistance Committee
DEVCO	Directorate-General for International Cooperation and Development
EC	European Commission
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EU	European Union
GHG	Greenhouse Gas
INDC	Intended Nationally Determined Contribution
MIP	Multiannual Indicative Programme
NDC	Nationally Determined Contribution
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
UNFCCC	United Nations Framework Convention on Climate Change