Objective of the project

The project aims to develop sustainable land-, soil- and crop-information hubs in national agricultural research organizations to enhance the effectiveness of national Agricultural Knowledge and Innovation Systems (AKIS) and contribute to rural transformation and Climate Smart Agriculture (CSA) in East Africa.

Background

In East Africa climate change leads to a drastic reduction of the quality and resilience of the land, increased greenhouse gas emissions and food and nutrition insecurity for the growing urban and rural population. Climate-Smart Agriculture (CSA) can mitigate the impacts of climate change focusing on three aspects of agricultural production:

✓ sustainable intensification
✓ increasing resilience against climate change, and
✓ contributing to climate change mitigation through reduced carbon emissions from land use through sequestration of carbon in soils.

Governments in Ethiopia, Kenya and Rwanda included CSA in national policies and, together with the EU, the Netherlands' Ministry of Foreign Affairs and other donors, made large investments in the land, soil and crop information services (LSC-IS) carried out by their national agricultural research institutes.

Currently, LSC information is often not used effectively in decision-making, because it is not available in an organised and accessible form and is not seen as 'owned' by national organisations. Therefore, stakeholders at national and local levels, including smallholder farmers, are not well equipped to evaluate their policies, plans and farming practices and improve and transform these in a climate smart manner. This project starts, therefore, with the safe assumption that soil, land and crop information can help to improve the efficacy of CSA related policies, plans *and* practices.

The project's Theory of Change (ToC)

The expected impact of this LSC-IS initiative is a contribution to an increased agricultural productivity and farm income especially for small scale farmers (male and female) based on climate resilient and sustainable food production in Ethiopia, Kenya and Rwanda. To be able to get 'closer' to this desired change the LSC-IS project team believes that we need to work together with partners and stakeholders so that by the end of the project we i) have roadmaps for the design of an enhanced AKIS (AKIS 2.0) that reduce the gap between research and practice, ii) have created national multi-stakeholder partnerships, to constantly improve access to data and information necessary for climate smarter production, and iii) have dynamic LSC hubs that are actively used for policy development and decision making for Climate Smart Agriculture (CSA) at national and local levels.

During the LSC-IS project, we will test different strategies for hub design, gather lessons learnt in Ethiopia, Kenya and Rwanda, and ensure that National Agricultural Research Centers can actively operate the LSC-hubs. This means that LCS-hub users are familiar with data and services provided by the hubs and that LSC-hub data are included in business plans (e.g., of farmers or agricultural input providers). The LSC-hubs will particularly facilitate the provision and application of LSC data in CSA related policy and decision making by stakeholders. This in turn requires our LSC-IS Team to take care of widely disseminating lessons learned and recommendations for sector performance.

The LSC-IS initiative will link research and innovation to practice, linking the latest advances in data and information management to the needs of particularly small-scale farmers related to climate smart agriculture. Our activities (referred to as 'our action' in the ToC) will align both EU and national priorities regarding
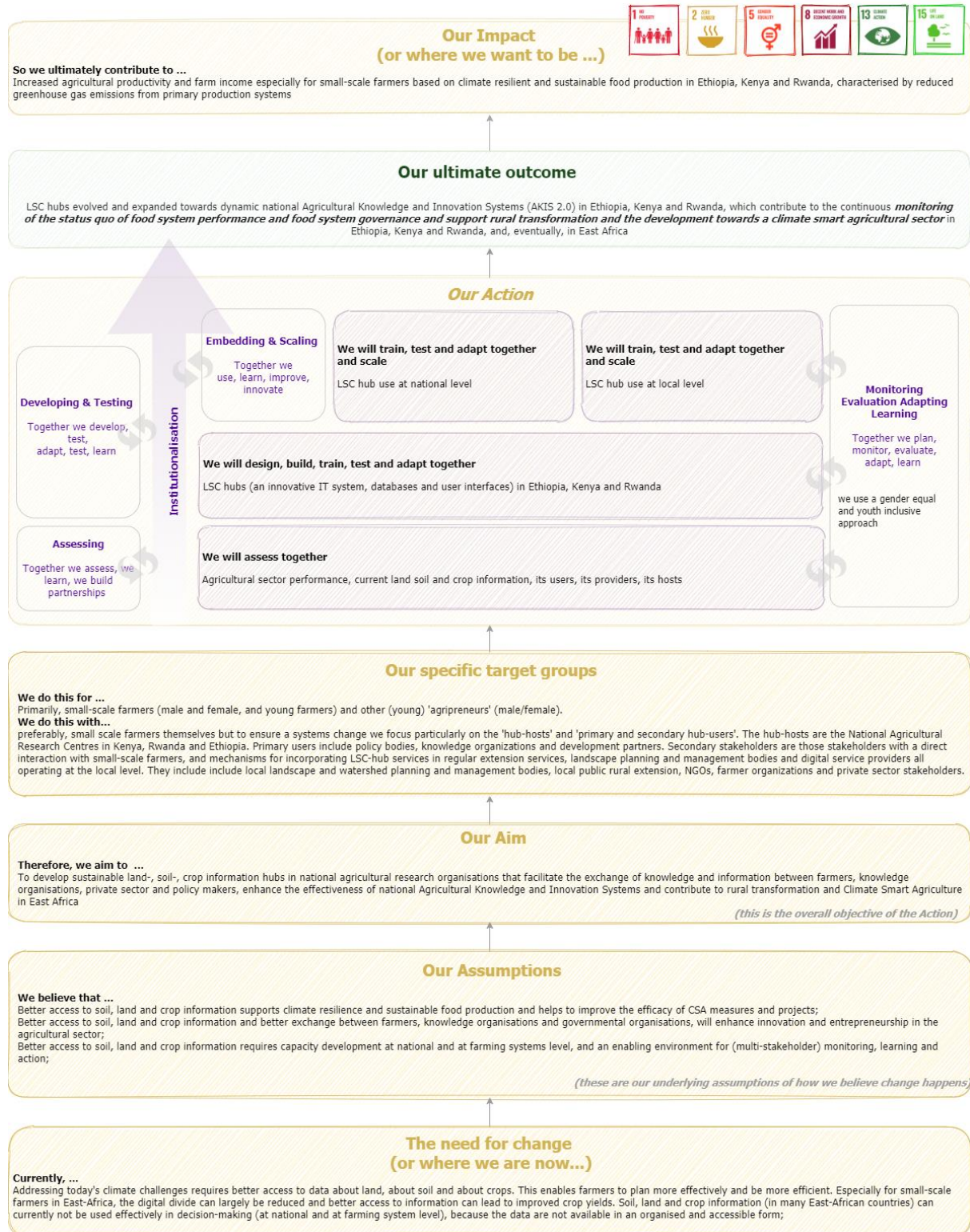
agriculture and food systems. It will focus on context-based information and include agro-ecological principles as a basis for decision management support. It will include multi-stakeholder approaches and develop partnerships to enhance the national AKIS in Ethiopia, Kenya and Rwanda. The action will link up with existing projects in the countries to create synergies and avoid overlaps. It includes a strong focus on capacity development of both National Agricultural Research Centers and providers of land, soil and crop information services, as well as of the user's community to ensure a sustained pull for develop capacities. The project will translate 'institutional embedding' into concrete activities to ensure sustainability of the action, characterised by viable business plans. We will apply participatory approaches to engage users and ensure relevance, which means that we will follow a *gender equal* and *youth inclusive approach in all project activities*.

In this way we work towards our ultimate project outcome:
LSC hubs have evolved and expanded towards dynamic national Agricultural Knowledge and Innovation Systems which contribute to the continuous monitoring of the status quo of food system performance and food system governance and support rural transformation and the development towards a climate smart agricultural sector in Ethiopia, Kenya and Rwanda and, eventually, in East Africa.

The figure below presents our Theory of Change visually. The ToC is a Living Document, we will update it based on our project findings and outputs, e.g., in the context of the needs assessments in Work Package (WP) 2.

Theory of Change
DeSIRA
Land Soil Crop Information Hubs
to support rural transformation and Climate Smart Agriculture in Ethiopia, Kenya and Rwanda

Our Impact
(or where we want to be ...)

So we ultimately contribute to ...
Increased agricultural productivity and farm income especially for small-scale farmers based on climate resilient and sustainable food production in Ethiopia, Kenya and Rwanda, characterised by reduced greenhouse gas emissions from primary production systems

Our ultimate outcome

LSC hubs evolved and expanded towards dynamic national Agricultural Knowledge and Innovation Systems (AKIS 2.0) in Ethiopia, Kenya and Rwanda, which contribute to the continuous *monitoring of the status quo of food system performance and food system governance and support rural transformation and the development towards a climate smart agricultural sector* in Ethiopia, Kenya and Rwanda, and, eventually, in East Africa

Our Action

Institutionalisation

Embedding & Scaling
Together we use, learn, improve, innovate

We will train, test and adapt together and scale
LSC hub use at national level

We will train, test and adapt together and scale
LSC hub use at local level

Developing & Testing
Together we develop, test, adapt, test, learn

Monitoring Evaluation Adapting Learning
Together we plan, monitor, evaluate, adapt, learn

we use a gender equal and youth inclusive approach

We will design, build, train, test and adapt together
LSC hubs (an innovative IT system, databases and user interfaces) in Ethiopia, Kenya and Rwanda

Assessing
Together we assess, we learn, we build partnerships

We will assess together
Agricultural sector performance, current land soil and crop information, its users, its providers, its hosts

Our specific target groups

We do this for ...
Primarily, small-scale farmers (male and female, and young farmers) and other (young) 'agripreneurs' (male/female).
We do this with...
preferably, small scale farmers themselves but to ensure a systems change we focus particularly on the 'hub-hosts' and 'primary and secondary hub-users'. The hub-hosts are the National Agricultural Research Centres in Kenya, Rwanda and Ethiopia. Primary users include policy bodies, knowledge organizations and development partners. Secondary stakeholders are those stakeholders with a direct interaction with small-scale farmers, and mechanisms for incorporating LSC-hub services in regular extension services, landscape planning and management bodies and digital service providers all operating at the local level. They include include local landscape and watershed planning and management bodies, local public rural extension, NGOs, farmer organizations and private sector stakeholders.

Our Aim

Therefore, we aim to ...
To develop sustainable land-, soil-, crop information hubs in national agricultural research organisations that facilitate the exchange of knowledge and information between farmers, knowledge organisations, private sector and policy makers, enhance the effectiveness of national Agricultural Knowledge and Innovation Systems and contribute to rural transformation and Climate Smart Agriculture in East Africa

(this is the overall objective of the Action)

Our Assumptions

We believe that ...
Better access to soil, land and crop information supports climate resilience and sustainable food production and helps to improve the efficacy of CSA measures and projects;
Better access to soil, land and crop information and better exchange between farmers, knowledge organisations and governmental organisations, will enhance innovation and entrepreneurship in the agricultural sector;
Better access to soil, land and crop information requires capacity development at national and at farming systems level, and an enabling environment for (multi-stakeholder) monitoring, learning and action;

(these are our underlying assumptions of how we believe change happens)

The need for change
(or where we are now...)

Currently, ...
Addressing today's climate challenges requires better access to data about land, about soil and about crops. This enables farmers to plan more effectively and be more efficient. Especially for small-scale farmers in East-Africa, the digital divide can largely be reduced and better access to information can lead to improved crop yields. Soil, land and crop information (in many East-African countries) can currently not be used effectively in decision-making (at national and at farming system level), because the data are not available in an organised and accessible form;

Outputs:

Our outputs are organised under work packages.

- ✓ **Work package 2** outputs include institutional assessments and sets of user requirements that define the data and services that will be provided by the hubs, guide the design of the LSC-hubs *and* capacity needs assessments of hub hosts as a basis for capacity building activities.

- ✓ **Work package 3** will develop the actual LSC data hubs in the three countries, provide data and GIS layers and links to existing sources of LSC data . WP3 also prepares curricula and training materials to train staff, as well as long-term plans for institutional embedding in the hub host organizations.

- ✓ **Work package 4** ensures that national stakeholders are aware and able to use information from the LSC-hubs and to provide input in design of the hubs. WP4 also provides definition of an upscaling approach and describes how LSC-hub services will be used in business processes of national stakeholders. WP4 will also provide business plans, financial strategies and partnerships at national level that will secure long-term access to the hubs.

- ✓ **Work package 5** will ensure that farmers and other local LSC-hub users are made aware *of* and trained *in* the use of the hubs and are able to provide their input to the design of the hubs. WP5 also describes the use of hubs for farm- and catchment planning and management. WP5 will particularly focus on translating local level applications of LSC-hub services s into hub sustainability plans.

- ✓ **Work package 1** provides the annual workplans and provides support for participatory monitoring evaluation adaption and learning (PMEAL) and therefore a specific PMEAL plan, complemented by a communication strategy and communication material, will be prepared.

Potential risks:

The Covid-19 pandemic and measures from Ethiopian, Kenyan and Rwandan governments to manage it can delay and hamper team building, stakeholder engagement and participation in workshops and training, especially in the early stages of the project. We will closely monitor the situation in the countries to assess and mitigate this risk by limiting physical meetings, local and international travel, increase online communication and will focus development of training towards engaging local partners, develop blended learning and online training tools. Local data sources may be of poor quality or not freely accessible, requiring us to apply a flexible approach and using open data. The development of the information system of the LSC- hubs is difficult to plan. To mitigate this, we will follow an agile, participatory approach and iterative system development.

Main activities:

To achieve above outputs our LSC-IS Team will be 'assessing', 'developing and testing', 'embedding and scaling' and 'monitoring and learning' in the following work packages.

- ✓ **Work package 1- Facilitation:** particularly focuses on creating a conducive learning environment for the implementing teams, on facilitating multi-stakeholder learning and including effective communication to keep stakeholders and general public informed and engaged about performance and progress of the Action. Work package 1 also safeguards the application of a participatory and an inclusive approach.

- ✓ **Work Package 2- Needs assessment:** will prepare agricultural sector assessments and stakeholder overviews at national and local levels and information-needs assessments of users at national and local level, as well as an assessment of the capacity of the hub host. These will provide the requirements for the design of the hubs.

- ✓ **Work Package 3- LSC-hub development:** will design, build and test innovative IT system, databases of land, soil, crop and other data, and user interfaces of the hubs in Ethiopia, Kenya and Rwanda, and train staff in the operation and maintenance.

- ✓ **Work Package 4- LSC-hub use at national level:** will introduce and train national level users in the use of the hubs engage them in testing and collect feedback, demonstrate the use of LSC-information in CSA related agricultural policy, planning and agricultural extension systems, and implement and adapt sustainability and financial strategies of the LSC-hubs.

- ✓ **Work Package 5- LSC-hub use at local level:** will introduce and train farmers and other local stakeholders in using the hubs and engage them in testing and collecting feedback, demonstrate the use of LSC-

information for climate smart farm- and watershed management, and include local level use of LSC-hub services in LSC-hub sustainability plans. Specific attention will be paid to ensure the embedding of the information hubs and optimize their role in supporting policy change, hence to increase the sustainability of the action.

Organization:

This DeSIRA project is managed via a delegated cooperation with the Netherlands Ministry of Foreign Affairs and is implemented by Wageningen University & Research (WUR), ISRIC-World Soil Information and the International Livestock Research Institute (ILRI), through the Climate Change Agriculture and Food Security program (CCAFS) of CGIAR. The National Agricultural Research Centers in the countries, the Ethiopian Institute for Agricultural Research (EIAR), the Kenya Agriculture & Livestock Research Organization (KALRO), and the Rwanda Agricultural and Animal Resources Development Board (RAB), are principle national implementing partners.

WUR and ISRIC will manage the LSC-IS project together, CCAFS will lead Work package 2: Needs assessment and LSC-hub design, and WP4: LSC-hubs use at national level. ISRIC will steer Work package 3: Hub development. WUR will lead Work package 5: LSC-hubs use at local level.

Implementing organizations:

The project will be implemented by WUR, ISRIC and ILRI/CCAFS.

Main partners:

EIAR, KALRO and RAB will be co-developers of the LSC-hubs as well as beneficiaries as their capacity is being built and strengthened through the LSC-IS Action. In addition, a number of (knowledge) institutions will be involved to provide specific input in the process.

Other main stakeholders:

The ultimate beneficiaries of the project will be male and female small-scale farmers (including young as well as experienced farmers), and other users and producers of knowledge and information. Primary users of the project's services include policy bodies, knowledge organizations and development partners; Secondary users are local landscape and watershed planning and management bodies, local public rural extension, NGOs, private sector, farmer organizations and farmers themselves.

Region:

Ethiopia, Kenya, Rwanda in East Africa.

Funding and co-funding:

EU	€ 5,300,000
Netherlands Ministry of Foreign Affairs	€ 1,400,000
ISRIC	€ 200,000
Total budget	€ 6,900,000

Duration:

4 years, from January 2021 to (and including) December 2024.