Objectives of the project

Improve the assessment of carbon footprint of Sahelian agro-silvopastoral ecosystems in order to better quantify their impacts on climate change; to foster the development of livestock policies adapted to the Sahel region, strengthen the capacities of involved actors and support changes in practices and policies.

Background

The Paris Agreement has strengthened the global efforts to fight climate change by requiring all country members to set climate targets, particularly in terms of GreenHouse Gas (GHG) reduction. According to the current estimation models, GHG emissions from ruminants in (agro) pastoral systems represent a significant share of the total GHG emissions in many developing countries, emissions which are expected to increase in the coming decades. Therefore, one of the major challenges of the CaSSECS project is to improve the quality of the data to acquire a better vision of the impacts of (agro) pastoral livestock farming systems on the environment. In the end, it is about enabling (agro) pastoral farmers to continue to live from their practices, by producing products and services and having the ability to adapt and participate in the mitigation of climate change effects. Undeniably, Sahelian (agro) pastoral livestock systems are threatened, in particular because they are regarded as significant emitters of GHGs. Such a vision could be balanced with more consistent data, repositories and reliable scientific and technical skills.

The theory of change to achieve the objectives

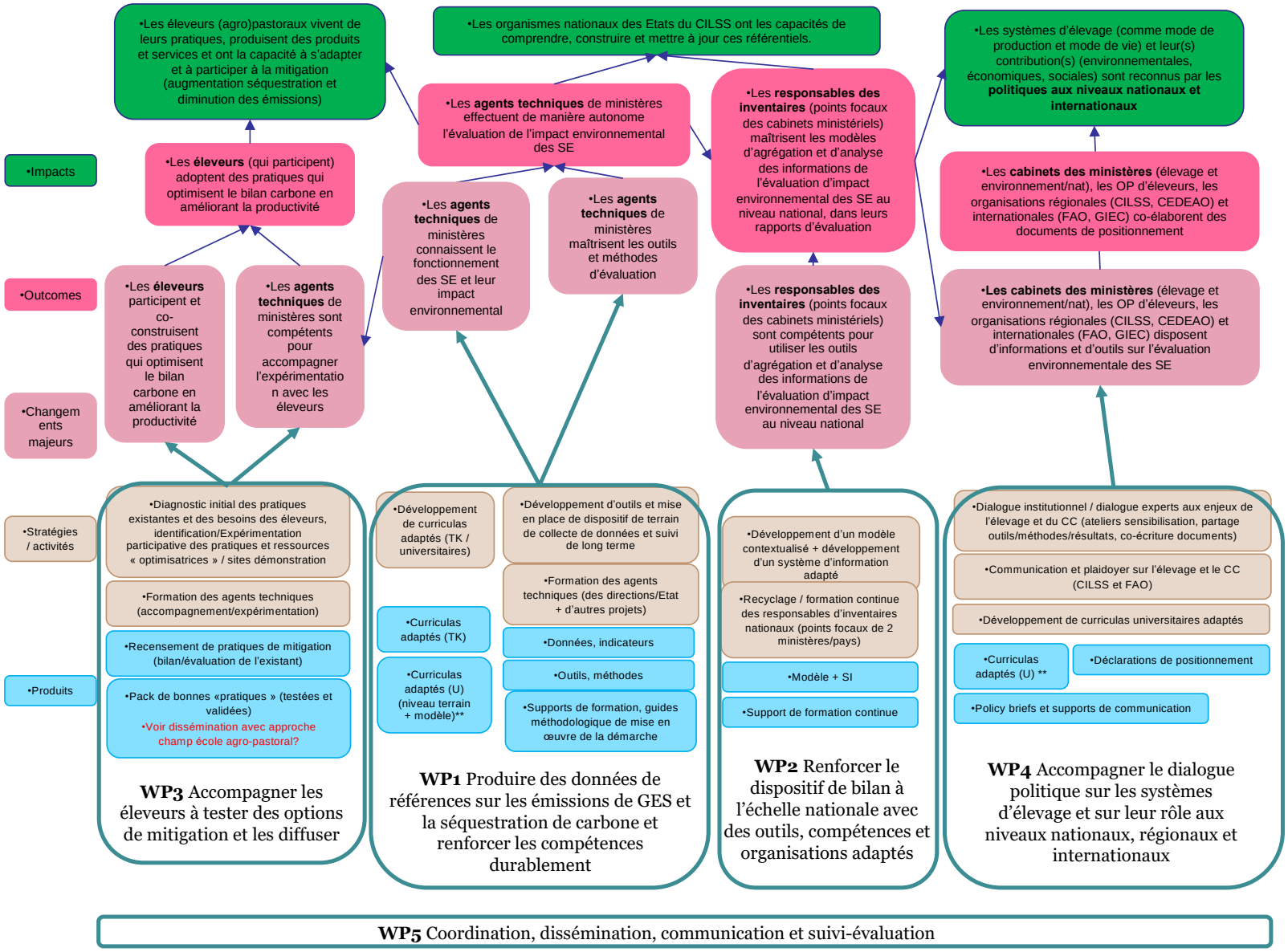
The expected impacts of the project are: (i) livestock farmers live from their practices, produce products and services and have the capacity to adapt and participate in mitigation processes, (ii) national organisations of the CILSS (Permanent Interstate Committee for Drought Control in the Sahel) States have the capacities to understand, build and update the repositories on the environmental impact of livestock systems to elaborate their policies, (iii) livestock and pastoralism systems' contributions (environmental, economic and social) are recognized by politicians at national and international levels.

To achieve these results, the CaSSECS project performs an initial diagnosis of existing practices and needs of livestock farmers; implements participatory experiments of "optimal" practices and resources; sets up training for technical agents; develops suitable programs, tools and field devices for data collection and long-term monitoring; develops a contextualized model and an adapted information system; sets up institutional dialogue; communicates and advocates on livestock and climate change.

The CaSSECS project supports (agro) pastoralists to adopt practices to improve their C footprint, while maintaining/improving the productivity of their systems. Then, the project makes the technical agents of the ministries competent and autonomous in the implementation of reliable and rigorous devices

DeSIRA PARTNERSHIPS FOR INNOVATION

CaSSECS - Carbon Sequestration and greenhouse gas emissions in (agro) Sylvopastoral Ecosystems in the Sahelian CILSS States



for measuring the environmental impact of livestock systems. The project plans to make available to the national inventory managers necessary data for a comprehensive trend analysis of the environmental impact of livestock systems. Finally, the CaSSECS project plans to lead the cabinets of ministries, professional livestock farmers' organisations, regional and international organisations to mobilize all the reliable data and the mitigation options.

The main final expected outcomes are: (i) livestock farmers adopt optimized carbon footprint practices while improving productivity, (ii) technical agents from ministries carry out an independent assessment of the environmental impact of livestock systems, (iii) national inventory managers master aggregation models and information analysis from the national environmental impact assessment of livestock systems at national level, and are able to integrate them in their assessment reports, and (iv) cabinets of ministries, professional livestock farmers' organisations, regional and international organisations co-develop positioning documents.

The outputs of the CaSSECS project are: (i) an inventory of mitigation practices, (ii) a pack of tested and validated optimized practices, (iii) adapted university curricula, (iv) data and environmental impact of livestock systems indicators, (v) data collection and long-term monitoring tools and methods, (vi) training materials and methodological guides for implementing the approach, (vii) positioning statements, policy briefs and communication materials.

Main activities

The main activities of CaSSECS project are:

- ✓ Production of a baseline data on GHG emissions and C sequestration (evaluation of productivity and emissions linked to animals, evaluation of the contribution of soil to the C footprint, evaluation of the contribution of spontaneous vegetation to the C footprint),
- ✓ Improvement of the assessment system on a national scale (mapping the characteristics and dynamics of ecosystems, spatio-temporal modelling of the distribution of livestock and their mobility, fodder assessment and C footprint of agro-pastoral farming at the national level,
- ✓ Co-design and dissemination of options to mitigate the impact of livestock on CC (efficient improvements in animal ration, sustainable management of resources at the territorial level, evaluation of mitigation options),
- ✓ Training and capacity building on the assessment procedures of the environmental impact of livestock systems (student training, professional training).

Results obtained so far (December 2022)

Regarding livestock-related activities, several studies and experiments have been conducted to assess the level of ingestion, digestibility and potential of enteric methane emission in ruminants using different forages, both cultivated and from natural grazing. The demographic parameters of the herds and their mobility are also monitored. These studies have produced a series of data sets and maps on a territorial scale and will continue in order to ensure continuity and contribute to increased reference data.

With concern to activities related to herbaceous vegetation, botanical collections and measurements, they are carried out and biomass is monitored, especially thanks to the use of drone technology. The new data acquired will enhance the vegetation maps produced by the CSE (Centre de Suivi Ecologique) at national level in Senegal.

A system for monitoring the growth of tree roots and trunks has also been set up to assess carbon accumulation in ligneous plants. The dynamics of woody communities and their dendrometric

characteristics are studied. This data is used to estimate the carbon storage of the various tree species that are in the majority in the selected areas.

Regarding ground and gas exchanges-related activities, two towers for measuring greenhouse gas (GHG) flows, installed before the project, have been reinforced and updated. They have been measuring daily GHG flows since March 2018. A system of static chambers with greenhouse gas analysers has been completely built and installed at two project sites in order to obtain data on gas exchange between the soil and the atmosphere. This system has produced significant data sets on gas exchange in agro-sylvopastoral systems. A large number of soil samples are taken from different areas and according to different grazing management methods, in order to analyse their carbon stock capacities.

Finally, several training courses on the various systems and methods [particularly in terms of method of monitoring animal demographics and method of analysis by Near-InfraRed Spectroscopy (NIRS)] were provided during the first three years of the project. The pedagogical ambition of these courses is to build the capacity of the project's technicians, researchers, 30 Master trainees and 10 PhD students in order to facilitate the creation of benchmarks. In 2022, a survey of training needs and requirements was carried out among pastoralists and agropastoralists in the countries involved, as well as technical service staff. The aim is to make all references and tools designed accessible to those who need them.

Organization

The project is built around five work packages: (i) production of reference data on greenhouse gas emissions & C sequestration, (ii) improvement of the assessment system at the national level, (iii) co-design & dissemination of livestock impact mitigation options, (iv) training & skills enhancement on environmental impact assessment, (v) coordination, dissemination, communication & monitoring-evaluation.

CaSSECS project builds upon the achievements of the Platform in Partnership for Research and Training "Pastoralism and Dry Areas" (dP PPZS). One of the institutions' members of the dP PPZS, the "Institut Sénégalais de Recherche Agricole" (ISRA), is the main applicant for the project. It is accompanied by nine [9] co-applicants and eight [8] associated institutions. CaSSECS' coordination team is established and works under the supervision of a coordinator and a scientific animator. The rest of the coordination team is composed of, a specialist in project monitoring and evaluation, a specialist in communication, an administrative and financial officer who all bring their expertise. The project includes the establishment of a Steering Committee and a Scientific Committee that hold a meeting at least once a year.

Implementing organization

Institut Sénégalais de Recherche Agricole (ISRA)

Partners of the project

- ✓ Université Cheikh Anta Diop de Dakar (UCAD)
- ✓ Centre de Suivi Écologique (CSE)
- ✓ Centre de coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
- ✓ Institut de l'Environnement et de Recherches Agricoles (INERA)
- ✓ Centre International de Recherche-Développement sur l'Élevage en zone Subhumide (CIRDES)
- ✓ Centre Régional Institution spécialisée du CILSS (Agrhymet-CILSS)
- ✓ Institut de Recherche pour le Développement (IRD)
- ✓ University of Copenhagen
- ✓ Université Catholique de Louvain (UCL)

Other main stakeholders

Direction de l'élevage du Sénégal, Réseau de Communication sur le Pastoralisme Antenne de l'Ouest (Recopa), Association pour la Promotion de l'Élevage au Sahel et en Savane (APESS), Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE), Centre national de la recherche scientifique (CNRS), Université Paul Sabatier Toulouse III, Lunds University, Food and Agriculture Organisation of the United Nations (FAO).

Location

Six Sahelian CILSS countries: Senegal, Burkina-Faso, Niger, Mali, Chad and Mauritania.

Funding and co-funding

European Union	€ 5,000,000
Implementing organization and partners	€ 555,000
Total budget	€ 5,555,000

Duration

Four (4) years; January 2020 - December 2023
(a request for a one-year extension has been made to the donor).

Website

https://www.cassecs.org/

Updated on 11/05/2023