Objectives of the project

The main objective is to foster innovation in agriculture through consolidation of the Research and Development capacity of the Food and Agricultural Research and Extension institute (FAREI) to address climate change challenges and development of climate smart practices for sustainable production. The specific objectives are: 1) improve the level of food security and the contribution of agriculture to the economy in the country; 2) provide safe and quality food for the local population and for export; and 3) promote sustainable management of land, water and other natural resources.

Background

The agricultural sector (crop and livestock) is confronted with major challenges including high farm vulnerability to climate change. A decline in agricultural production by as much as 30% is projected in the National Climate Change Adaptation Policy Framework, leading to concerns over food security by 2050. Climate change has often led to abandonment of agricultural land, decreasing land productivity, high pre and postharvest losses due to biotic and abiotic stresses. Livestock productivity is also affected, leading to reduction in farm revenue, environmental degradation and biodiversity loss and heavy reliance on importation of feed ingredients, agrochemicals and veterinary drugs.

Tissue culture of garlic

Moreover, to improve national food security, marginal lands in environment sensitive areas such as mountain slopes are being put under intensive agricultural production. In these rain-fed agricultural zones, climate change is expected to further exacerbate the adversities faced by farmers and breeders, in particular fodder availability. Thus, to maintain the sustainability of the agricultural resource base and farm productivity, there is need to develop capacity to cope with climate change and promote sustainable and climate smart agricultural production systems.

In this regard, a number of policy measures have been proposed for resilience to impacts of climate change on agricultural production, produced in several documents namely,

- ✓ Mainstreaming Climate Change Adaptation in the Development Process in the Agriculture Sector of the Republic of Mauritius in the context of the Africa Adaptation Programme (AAP) (2012)
- ✓ Technology Needs Assessment (TNA) report (August 2013)
- ✓ National Climate Change Adaptation Policy Framework (2012)
- ✓ Strategic Plan 2016 - 2020 for the Food Crop, Livestock and Forestry Sectors (2016)
- ✓ Nationally Determined Contribution (2015)

Adaptation measures highlighted in the different policy documents address diversification of farming systems to include a range of crops and livestock particularly small livestock rearing and feed and fodder production and conservation technologies, integrated pest and disease management, biodiversity conservation; rainwater harvesting and efficient irrigation system, sustainable land

management and integrated soil fertility management, sheltered farming, organic farming, improved soil carbon. Mitigation measures include management and recycling of agricultural wastes and residues (e.g. composting), integrated crop-livestock and agroforestry systems to enhance carbon sequestration.

The theory of change to achieve the objectives

FAREI has already embarked into the implementation of some of the proposed measures of adaptation and mitigation which form part of its programme of work with the overall objective of fostering innovation in agriculture to raise national food security and safety in the context of sustainable development and contributing to reducing poverty and vulnerability. In this respect, the proposed action under the DeSIRA initiative aims at further consolidating FAREI's capacity to address the above measures.

The project improves food safety and promotes efficient and sustainable production practices by developing FAREI Research and Development capacities (human resources, infrastructure and equipment) in biotechnology and renewable biological alternatives to agro-chemicals especially in the fruit sector and livestock sector regarding the production phase and post-harvest phase. The project also strengthens institutional capacities (human resources, infrastructure and equipment) in R&D on Integrated Pest Management (IPM) technologies, surveillance and early detection of pests and diseases. The project carries out R&D activities on sustainable agriculture practices based on resource conservation technologies and bio-farming to increase resilience to climate change and to optimize use of natural resources (land, water, organic matter). These activities include the setting up of a model agro-forestry plot, the promotion of climate smart livestock production (waste recycling, small livestock production, the integration of livestock farming and Clean Green and Ethical (CGE) concept, the introduction of new varieties of mushrooms, and the improvement of the resilience of small farmers to climate change through the introduction of climate smart water saving technologies.

The project develops systemic resilience to climate change by improving data and information management (collection, repository, access) to support early warning and dissemination. FAREI promotes the use of new ICT technologies (including the use of drones) to assist small farming operations with water and disease management, to provide a boost in crop intelligence, and to assess farm livestock performance and farm productivity.

The diffusion of the results of the project is based on the training of trainers and the dissemination of documents.

Main activities

The project consists of upgrading research facilities through R&D in biotechnology and renewable biological alternatives to agro-chemicals, the setting up of a soil water and plant laboratory, the development and use of improved technology for optimising the utilisation of feed resources and feed formulation packages, the development of sustainable pest and disease management practices, the development of a data collection and dissemination system, the characterisation and utilisation of local animal genetic resources, the use of climate smart water saving technologies, the development of a controlled glasshouse environment for breeding trials.

The activities also include capacity building of researchers and professionals, development of training materials, and training of trainers.

Results achieved to date (September 2023)

As at end of September 2023, several projects have been completed. The main achievements include the setting up and operation of a soil water lab for the analysis of soil samples for farmers, introduction of novel technologies such as vertical farming and novel irrigation systems with better water use and energy efficiency and higher yields reported in selected crops.

Novel irrigation system: KNSM spray irrigation system

Button mushroom was successfully grown for the first time in Mauritius and the technology is being transferred to potential entrepreneurs.

Novel crops such as blueberry and new promising varieties of litchi and avocado have been introduced locally and are being distributed to farmers.

An IPM package on the sustainable management of the diamondback moth in cabbage cultivation has been developed and is actively being promoted among farmers island wise. A booklet and video clip have been produced to sensitise farmers on climate smart practices. A significant reduction in pesticide usage has been reported.

Vertical farming

New protocols for fruit/vegetable processing have been developed. Automatic weather stations have been installed island wide and will provide real time weather data. This will enable irrigation to be planned and disease forecasting on selected crops.

Dairy goats have been purchased under the project are being multiplied for distribution to farmers and the milk is being used by entrepreneurs for value addition products.

The booklet "Cahier des Charges for quality pork production" has been published and promoted among the pig breeders. The booklet has been designed to help pig farmers to adopt good farm management practices to move towards production of good pork quality and meet food safety norms. Pig breeders have reported an increase in production through improved feeding management, better management of the reproductive nucleus, better management of piglets resulting in improved weaning weight, reduction in piglet mortality by 10 %. A 25 % increase in selling price of piglets was observed.

Research officers have benefitted from capacity building and are now better trained to carry out their research work to address farmers problems. Farmers through the various demonstrations, group meetings, workshops held under the DeSIRA project have improved their skills and knowledge and are better equipped to adopt best practices, reduce use of agrochemicals and improve their productivity.

Organization

The project is implemented by FAREI which operates under the aegis of the Ministry of Agro Industry and Food Security. The Institute has the responsibility to conduct research in non-sugar crops, livestock, forestry and to provide an extension service to farmers in Mauritius including its outer islands. The mission is to consolidate the national goal of food security, improve the productivity of the farming community and diversify the production base in line with the policy requests of government in terms of food and nutrition security and safety. The management team comprises three Assistant Directors led by a Chief Executive Officer. Monthly Project Coordination Meetings are held where the EU is invited as observer to follow up on project implementation.

Implementing organization

Food and Agricultural Research and Extension institute (FAREI)

Location

Republic of Mauritius

Funding and co-funding

EU	€ 2,500,000
FAREI	€ 79,000
Total budget	€ 2,579,000

Duration

48 months (2019-2023)

The project was officially launched in February 2020 by the Minister of Agro Industry and Food Security and the EU Ambassador, in presence of the farmer community. The event benefitted from considerable press coverage and was also published on the European Union External Action (EEAS) website.

Website

https://farei.mu/farei2021/?page_id=906

Updated on 06/10/2023