STRENGTHENING AFGHANISTAN INSTITUTIONS CAPACITY FOR THE ASSESSMENT OF AGRICULTURE PRODUCTION AND SCENARIOS DEVELOPMENT

GCP/AFG/087/EC programme for Afghanistan
IMPACT

“Government adopts improved national policy and strategies for increasing and diversifying production potentials and the development of recommendations and pathways for achieving sustainable and diversified land uses”

OBJECTIVES

• Monitoring and analysis of agriculture production systems including assessment of land suitability and comparative advantage of different land and water use options through established NAEZ and LRIMS.
• Support evidence-based decisions in planning and management of the agricultural sectors and natural resources in the country through developed scenarios and adaption strategies.
• Institutions develop and operate innovative agriculture monitoring systems enabling the integration of satellite remotely-sensed data.
• Government capable to develop policies and strategies in agriculture sector.

STRATEGY

OUTCOME

“Strengthening Afghanistan Institutions capacity for monitoring and analyzing of agriculture production systems and development of National Agro-Ecological Zoning (NAEZ) and Land Resources Information Management System (LRIMS)”

OUTPUTS

• Established NAEZ and LRIMS for monitoring and analysis of agriculture production systems, for assessment of land suitability and comparative advantage of different land and water use options.
• Impact scenarios of water availability, crop yield and socio-economics for all major agro-ecological zones, and adaptation strategies to support evidence-based decisions in planning and management of the agricultural sectors and natural resources in the country are developed.
• Innovative, up to date and/or complementary agriculture monitoring systems and survey methodology enabling the integration of satellite remotely-sensed data are developed.
• Enhanced Afghan’s Institutions’ capacities on agro-ecological zoning, agriculture monitoring optimized by use of geospatial technology and agriculture production systems at risk for policy formulation and adaptation planning in agriculture sector, as well as knowledge and information dissemination.
RESULTS

- Established National Agro-Ecological Zones (NAEZ) framework adapted to the Afghanistan conditions.
- Developed Land Resources Information Management System (LRIMS).
- Set of scenarios and models suitable for scaling up nationally for the planning and improved management for a variety of key agriculture land uses (LUT) across country’s agro-ecological zones implemented and analysed.
- Models and scenarios generated address:
  1. climate change impacts on water availability and current and future potential food insecurity risk;
  2. crop yield and socio-economics historical trends;
  3. land degradation and desertification;
  4. adaptive options accessible to decision makers;
  5. a range of future trends and threats adapted to the country’s conditions.
- Established operational agricultural monitoring system based on sustainable methods, tools, geospatial technology and in situ data and areas for improvement identified.
- Cotton and Rice crop area estimated and crop mask developed.
- National capacities enhanced, and guidelines, methodological documents, e-learning, modules and curricula developed.
- Knowledge management and dissemination of information and lessons learned for planning, monitoring and evaluation.

APPROACH

- Provide a standardized framework for characterizing climate, soil and terrain conditions relevant to agricultural production.
- Be based on a geospatial inventory of available and new generated natural resources compiled with recent remotely sensed data sets.
- Allow assessments of land productivity for location specific agro-ecological conditions.
- Enable the harmonization and integration of a variety of geospatial datasets, model scenarios and assessments.
- Valuation of the current national agriculture monitoring methodologies.
- Improve crop estimates methodology based on geospatial technology with focus on Cotton and Rice crop area estimation and grow national capacity.
- Integrate more fully the use of remotely-sensed data into the provincial agriculture offices for agriculture monitoring and statistics generation.
- Provide policy options for sustainable management of agriculture addressing issues of climate change mitigation and adaptation.
- Establish comprehensive capacity-building program targeting various agencies at different administrative levels.
- Be designed to facilitate sharing of good practices, lessons and knowledge management.
NAEZ is a spatial analysis system that provides the assessment of agricultural resources and potential for quantification of land productivity based on the FAO Agro-Ecological Zones methodology.

NAEZ provides production information under different future conditions including climate and resource inputs scenarios relevant to:
- agricultural production and local assessments of land suitability
- trade-offs among crops and between rain-fed and irrigated uses
- risk zoning and hotspot identification (e.g. biophysical threats, climate change)
- crop potential, yield gaps, climate adaptation requirements and options.

NAEZ is based on a geospatial inventory of natural resources compiled from existing national datasets and recent harmonized and integrated geospatial information. The inventory allows assessments of land and water productivity for location specific agro-ecological conditions now and in the future.

NAEZ enables the harmonization and integration of a variety of geospatial datasets, model scenarios and assessments. Provides standardized framework and database to support analysis of policy options for sustainable management, international conventions and agreements, addressing issues of climate change mitigation and adaptation.

NAEZ produces comprehensive resource accounts for land and water use: It aggregates the results for major land use/cover patterns by administrative units, major river basins and by land protection status or broad classes reflecting infrastructure availability and market access conditions.

NAEZ final result is a Data Portal which allows:
- free access to data and information
- visualization of data
- various analysis outputs
- download options
The Land Resources Information Management System (LRIMS) is a Data Integration and Analysis System for Land Suitability Evaluation and Modeling Land Responses to Agricultural Policies to be built and customized for the Afghan context.

LRIMS comprises a suite of user-friendly GIS-based information management and analysis tools organized into a toolbox. It introduces navigation, authoring, processing, query, and map-building capabilities, and offers standardized analysis functionality.

LRIMS presents a framework for the management of GIS content, provides straightforward access to organizational data and metadata organized into a central spatial database, and promotes collaboration between staff within an organization.

LRIMS allows evaluation of land-use suitability through multiple criteria analysis-based assessments of the physical/socio-economic conditions of land, including Socio-Agricultural Vulnerability Assessment (SAVA).

LRIMS would guide policy-makers in developing appropriate policies/plans and providing location-specific adaptation options for farmers through the evaluation of the benefits/constraints of different options and the simulation of different scenarios for various land-uses.

LRIMS enhances Data Sharing (e.g. through published and shared maps). LRIMS-authored maps would consequently be delivered through the web to unlimited numbers of users. A dedicated information portal would be built to provide information on land suitability.

The ultimate objective of LRIMS is to improve agriculture planning activities, policies and programs and eventually farmer productivity.
AGRICULTURE MONITORING SYSTEMS (AMS)

AMS based on innovative and sustainable methods, tools, geospatial technology and in situ data.

AMS analyzes in depth the existing country's agriculture, monitoring methodologies, and identifies the main sustainable methods and tools, including the review and validation of the existing information.

AMS develops innovative, up-to-date and/or complementary agriculture monitoring systems and improve the quality of data.

AMS improves data collection, analysis and dissemination systems, based on advanced approaches and technology and integral use of remote-sensed data.

AMS improves area and yield forecasting, crop monitoring and estimation, based on geospatial information.

AMS generates cropland information including the main crop types and seasonal crop dynamics at national/provincial level based on integration of the remote sensing, and identifies areas for improvement.

THE PROJECT WILL FOCUS ON RICE AND COTTON PRODUCTIVITY ASSESSMENT AND CROP AREA ESTIMATION FOR 2017 BASED ON RECENT HIGH RESOLUTION GEOSPATIAL INFORMATION:
Proba-V, Aqua/Terra, Landsat-8, Sentinel-1, Sentinel-2, SPOT-5, 6 & 7 and Pleiades-1A & 1B imagery.

It will further develop the existing agriculture monitoring system at provincial level through a regularly scheduled series of actionable crop production reports developed by the agriculture provincial offices.
The project will improve and strengthen national capacity to facilitate monitoring, analysis, interpretation of agriculture and natural resources information combined with information generated from remote sensing for sustainable agricultural land use planning and management.

To sustain the results, the project will implement customized training programmes for selected staff from the Government of Afghanistan.

**STRATEGY**

**Dissemination of agriculture and statistics information to farmers' groups through established Farmer Field Schools (FFSs)**

The project will undertake 15 FFSs with focus on Training of Trainers (TOTs) in order to extend the activity and disseminate the results of the project at national level.

**High level training on running impact scenarios and adaptation strategies at national and provincial levels.**

This supports the application of the tools to inform agricultural options appraisals and decision making and will assist in the integration of the data and developed scenarios into national agriculture policies plans and programmes.

**Delivering of high quality training materials in geo-information acquisition and technology**

and their application for agricultural mapping, monitoring, statistics and yield estimation, using the best available geospatial data and processing techniques.

**Developing e-learning modules and learning units on Geospatial information and technology for agriculture monitoring and environment impact assessment for multiple purposes, which will benefit from current learning modules developed within the FAO’s agricultural monitoring project in Pakistan and the SIGMA EU programme.**

**The project is specifically designed to facilitate sharing of good practices, lessons learned and knowledge management. Replication and scaling-up will be achieved by communicating value-added information products and agro-advisories to the most vulnerable population in the country.**