

Project Evaluation Series

Evaluation of the project “Improved Land Tenancy in Sindh Province”

Project code: GCP/PAK/137/EC

Annex 7. Project interventions for climate-smart agriculture and productivity enhancement

1. An internal document shared by the project with the evaluation team (document name “ILTS-CSA Demonstration Sites Implementation Strategy”) includes descriptions of the key contents of the curriculum developed by the project for farmer field schools and women open schools and the climate-smart agriculture (CSA) practices demonstrated by the project for productivity enhancement. It starts with a contextual analysis of agricultural production systems in the ILTS project areas based on a number of sources, including the project’s field research.
2. The document first identifies the following problems pertaining to agricultural productivity:
 - i. Soil degradation: soils in the project area are characterized by extremely low level of soil organic matter and high salinity and alkalinity.
 - ii. Lack of quality inputs and knowledge of improved agriculture practices: there is lack of availability of quality agriculture inputs like improved cultivars, certified seed, fertilizer (especially sulphate of potash), micronutrients and information regarding improved agriculture practices.
 - iii. Waterlogging and salinity: poor soil permeability and the formation of hard pan result in widespread waterlogging, which increases salt concentration in soils. This is particularly evident in Mirpur Khas, Tando Muhammad Khan and Sujawal.
 - iv. Low organic matter content of soils: soil organic matter content is very low because of minimal recycling of organic amendments. Lack of knowledge to enhance and/or protect soil organic matter from degradation (e.g. organic soil cover, rotation with legumes crop, appropriate storage and application of manure, reduced tillage) and harsh climatic conditions, which promote organic matter oxidation. Farmers tend to burn farmyard manure instead of using it in soil.
 - v. Injudicious use of water: fields located at the tail end of the canals are characterized by unfavourable water supply compared with fields located upstream. Canals, watercourses and drainage, which were already in rudimentary state, have been further damaged by floods. Sindh’s irrigation system is suffering from major water losses as watercourses are not properly lined, thereby exposing water to percolation and evaporation.
 - vi. Unequal land tenure: the economic relationship between landlords and tenants is defined by unwritten and non-transparent agreements.
 - vii. Low crop diversification: the area mostly has mono crop trends and two distinctive cropping patterns, like wheat-cotton in districts Matiari, Jamshoro, Tando Allah Yar and Mirpur Khas, and wheat-rice cropping pattern in districts Larkana, Dadu, Tando Muhammad Khan and Sujawal. The main production systems are wheat, cotton, rice and sugarcane.
 - viii. Lack of marketing facilities: lack of proper marketing mechanisms for major agriculture produce is a major problem. Furthermore, post-harvest and food processing facilities are not available, thereby forcing farmers to sell their production to the middleman at lower prices than government rates.
 - ix. Other problems, including: impact of climate change; non-availability of soil testing laboratories at local level; improper use of agricultural tools; irrational/excessive use of fertilizer and pesticides, which leaves negative impacts on natural resources; and, lack of knowledge regarding improved sowing methods, weeding, insect and disease identification and their management, and post-harvest loss management techniques.
3. The document explains the project’s approach, which entailed establishing farmer field schools and women open schools in 80 selected villages. These promoted water-efficient good agriculture

practices, integrated pest management, integrated plant soil nutrient management, post-harvest management, homestead/kitchen gardening, efficient livestock management and context-specific low-cost CSA technologies and practices in the prevailing climate change scenario. The project also established CSA demonstration sites for agriculture productivity enhancement. The overall aim was capacity building of both landowners and tenants, and relationship-building between landowners and tenants for the promotion of VGGT and informal tenancy agreements. This was expected to pave the way for achieving the ultimate project goal of tenure security and improvement in the relationships between landowners and tenants to promote food security and livelihood opportunities.

4. The document also summarizes the key contents of farmer field school and women open school curricula (which are attached with the document) and identifies specific CSA practices the project promoted and demonstrated: precision laser leveling; zero tillage/efficient tillage (zero till drill); farmyard manure/composting; organic mulching; multiple cropping/inter-cropping; raised bed/ridge planting; direct seeded rice with Happy Seeder; alternate wet and dry rice with line sowing; agroforestry and multipurpose hedgerows; homestead/kitchen gardening; efficient livestock management; efficient irrigation management; wheat cultivation on ridges with mustard hedgerow; onion, sugarcane and wheat inter-cropping; cotton cultivation on ridges with multipurpose hedgerows; cotton inter-cropping with chilies and moong bean; cotton inter-cropping with okra and cluster bean; sugarcane inter-cropping with alfalfa and canola; and high value vegetables inter-cropping with tomatoes, chilies, okra and gourds.
5. Some of these interventions are included in a comprehensive assessment of the challenges and responses to climate change in Pakistan, with reference to specific crops and provinces (CIAT; World Bank 2017). This assessment (pp. 14-25) provides a detailed smartness assessment for the top ongoing CSA practices, by production system, as implemented in Pakistan, with observations regarding the contributions of these practices to productivity, adaptation and mitigation. Practices observed in Sindh and other provinces include:
 - i. for wheat: use of drought-tolerant varieties and seasonal-adapted planting times (e.g. use of cropping calendars);
 - ii. for cotton: integration of organic fertilizer (balanced use of fertilizers), use of heat-tolerant varieties, and use of drought-tolerant varieties;
 - iii. for rice: direct rice seeding, correct timing of harvesting (measuring proper grain moisture), and alternate wetting and drying; and
 - iv. for sugarcane: integrated pest management (biological control), row planting with proper spacing, and soil ripping (without turning the soil upside down).

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