

**Promoting Spineless Cactus in Hilly/
Degraded Lands in for Fodder
Security in Tribal Areas in Odisha
(Capacity Development)**



**Spineless Cactus in Hilly/ Degraded Lands and Grass pea in
Winter Fallows for Fodder, Food & Nutrition Security in
Tribal Areas in Odisha Project**

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1. Background

In the context of climate change, the food and fodder availability for both human beings and livestock is being severely affected due to declining land productivity. Around 30% of India's total geographical area is under degradation and climate change is the main driver behind it. As per the National Bureau of Soil Survey and Land Use Planning, soil degradation in India is estimated to be occurring on 147 million ha of land. The situation is affecting more to small and marginal farmers who depend on multiple subsistence livelihood options including livestock rearing.

The Economic Survey of Odisha published in Feb 2021 reveals that the area under fallow land has increased to 10.79 lakh ha in 2019-20 from 10.47 lakh ha in 2018-19. In the context of climate change, due to prolonged droughts, frequent dry spells and desertification, the rural poor and smallholders are getting heavily affected.

The enhanced livestock productivity has a direct bearing on the rural economy. Evidences indicate that feed-related problems accounted for about 36 percent loss (per annum in value terms) in dairy animals and losses due to scarcity of dry and green fodder were estimated to be 11.6 percent and 12.3 percent, respectively (Birthal and Jha 2005).

As per the report submitted by State Level Task Force on Agriculture Development, in Odisha, there is a 55% shortage of green fodder. Based on production statistics, the green fodder availability is 13 million tons against the requirement of 28.7 million tons. Similarly, there is a shortfall of dry fodder by 50% (Rejuvenation of Agriculture, GoO). The scarcity affects the animal productivity most during drier months and hence calls for interventions to make green fodder available during those scarce days.

ICARDA and the Government of Odisha (Directorate of Soil Conservation and Watershed Development, Agriculture and Farmers' Empowerment Department) have joined hands to make the productive use of degraded hilly and wastelands. This initiative has been taken up in collaboration with different research and resource agencies to promote spineless cactus in degraded and wastelands for enhancing fodder availability and grass pea to improve livelihood security of poor and marginal households. The project contributes to the CGIAR thematic areas on increased food and nutrition security for better health and sustainable management of natural resources. The project contributes to the CGIAR thematic areas on increased food and nutrition security for better health and sustainable management of natural resources.

1.1 Goal

Productive use of hilly degraded/ wastelands, and winter crop fallows; and livelihood enhancement through the production of multipurpose spineless cactus and grass pea for fodder, food, and value-added products in the Indian state of Odisha.

1.2 Objectives

- a. Introduction and multiplication of local suitable spineless cactus and grass pea species;
- b. Standardize zero-till, agronomy, harvest, food/ fodder/ feeding/ value addition strategy;
- c. Productive use of waste, degraded, winter fallow land, and enhanced community livelihood;
- d. Capacity building of community, department, CBOs, and other stakeholders;



e. Science publications and papers on project impacts;

1.3 Strategy

ICARDA collaborates with agencies/ partners having reputation in both research and out-scaling. It also pulls in its in-house skills and competencies for smooth and effective implementation. ICARDA, over the last three years, has been collaborating with OUAT, other research agencies, local communities, and CBOs under this project.

The strategies being followed under the project are illustrated in the chart.



1.4 Geographical Spread of the Project

The project is being intensively implemented in 144 villages of 36 Gram Panchayats of 18 blocks in 6 districts of Odisha. In the extensive districts like Ganjam, Nayagarh, Kandhamal, and Khordha, only foundation nurseries have been established.

Based on the performance and acceptability of the fodder cactus by the local livestock, agencies & individuals from districts like Keonjhar, Jajpur, Sambalpur, Nuapada, Dhenkanal, Kendrapada, and Cuttack are showing interest to take up similar nurseries and plantation activities.

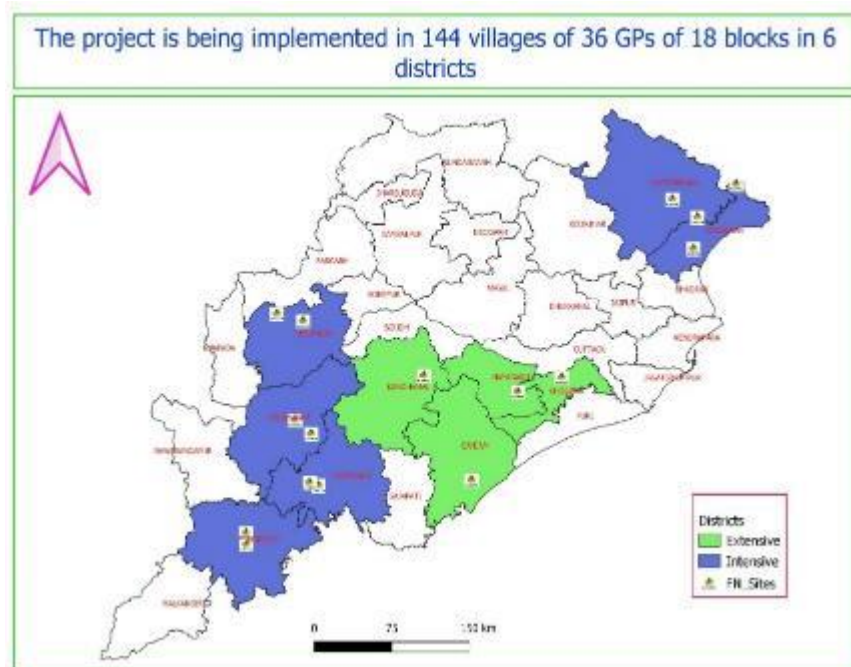


Figure 1: Map on project districts



2. Training & Capacity Building

2.1 Farmers' Field Days

During the financial year 2020-21, various capacity-building programs have been organized targeting multi-level stakeholders. These activities helped promote cross-learning among the community members. During this year, 24 FFDs have been conducted

Since the inception of the project, 44 FFDs, 31 technology trainings and 150 farmers/extension staff training on project practices have been conducted. One Out- country and two in-country exposure visits have been conducted.

Table 1: Details of Farmers Field Days (2020-21)					
Sl. No.	District	Nos of FFDs	Total Participants	Male	Female
1	Balasure	2	108	72	36
2	Bolangir	5	227	183	44
3	Kalahandi	9	188	87	101
4	Koraput	6	191	134	57
5	Rayagada	2	94	56	38
Total		24	808	532	276

Through the training and FFDs, around 3,332 numbers of individuals have been capacitated so far and 22,067 have got direct or indirect benefits through the establishment of nurseries and community plantations.

The FFDs focused on the methods of the plantation, agronomic practices, maintenance of plantation fields, disease & pest management as well as the use of cactus as fodder & soil conservation species. Each FFD accompanied one feed mix demonstration where the participants were exposed to the process of feed mix preparation using chopped tender cactus pads and other traditional feeds & fodders.



FFD at Rayagada



FFD at Koraput



FFD at Chhota begunia, Balasure



FFD at Kalahandi



2.2 Training on A-frame

Promoting soil & water conservation in sparsely vegetated hillocks and wastelands is one of the key objectives of the project. To maximise the efficiency of spineless cactus in moderating the eroding impacts of rain water, these need to be planted along the contours in a staggered manner. To ensure this, capacity building of staff was done on the use of an A-frame for contour demarcation. Two such training has been conducted for 72 participants from four districts. Following the training, 118.5 ha of land has been planted in staggered contour approach.

Spineless cactus plantations have also been taken up in the land parcels where the Department of Soil Conservation & Watershed Development has constructed staggered contour trenches. Over a period of time, plantation in such areas will increase the life span as well as efficiency of the trenches leading to increased soil & water conservation in the upper reach areas.



A- frame training at Bolangir



A- frame training at Paikapuki, Koraput

Personal information including Name, Business Title, Email, Phones, Images and GPS points included in this report have been authorized in writing or verbally by the data subject.

The Organizers



Directorate of Soil Conservation & Watershed Development (DSC&WD), Odisha has its headquarters in Bhubaneswar, Odisha. It is the state level nodal agency for implementing Watershed Development component of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), and is dedicated towards the soil, water and natural resources conservation, management, education, research and extension in the state of Odisha, India. The efforts and programs of the Department are aimed not only at providing soil cover to mitigate accumulated soil erosion, but also at providing the rural and farming communities with basic amenities, infrastructures and incentives for creating sustainable alternative farming systems with a view to wean them away from the destructive traditional methods of cultivation as well as uplifting the socio-economic status at large. Convergence with MGNREGS and various schematic programs of the line departments also provides opportunities for comprehensive area development and wider impacts across the sectors. For more information, visit, <http://www.soilconservationorissa.gov.in/>



Government of Odisha (ଓଡ଼ିଶା ସରକାର) governs the state of Odisha in the Republic of India. The state government has various well established departments to undertake the integral development of the state. The head of state of Odisha is the Governor, appointed by the President of India on the advice of the Central government, who heads the council of ministers, a judiciary, and a legislative branch.. The Chief Minister is the head of the council of the ministers and is vested with most of the executive powers. The State High Court is located in Cuttack. The legislative assembly of Odisha is unicameral, consisting of 147 members of the legislative assembly (MLA); (for details on various government initiatives, please visit, <http://www.odisha.gov.in/portal/default.asp>).



ICARDA (International Centre for Agricultural Research in the Dry Areas) established in 1977 is one of the 15 such centres supported by the CGIAR and mandated to promote agricultural development in the dry areas of the developing countries. The centre works on the problem-solving needs of resource-poor farmers through development and delivery of new technologies for sustainable growth in agriculture, in a partnership and multi-stakeholder approach, working in 50 countries. Its research and training activities cover crop improvement, water and land management, integrated crop-livestock-range land management, and climate change adaptation. The ICARDA gene bank holds over 155000 accessions from over 110 countries: traditional varieties, improved germ plasm, and a unique set of wild crop relatives of food legumes such as chickpea, lentil, fieldpea and fababean, wheat, barley, oats and other cereals, forage crops, range land plants, and wild relatives of each these species. ICARDA works in strong partnership with national agricultural research systems, Government Ministries, Community Linked Institutions; (For details, please visit: <http://www.icarda.org/>).