Agriculture and Horticulture Development in Phase-I areas of OTELP during Rabi, 2011 under Upscaling Strategy

Orissa Tribal Empowerment and Livelihood Programme (OTELP)

ST & SC Development, Minorities & Backward Classes Welfare Department Government of Odisha

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1. Introduction

1. Background

The overall strategy of the Orissa Tribal Empowerment & Livelihood Programme focuses on empowering the tribals and enabling them to enhance their food security, increase their incomes and improve their overall quality of life through more efficient natural resource management based on the principles of improved watershed management and more productive environmentally sound agricultural practices and through off-farm/non-farm enterprise development. The programme has attempted to ensure sustainable improvements in the food security and livelihoods of poor tribal households by promoting a more efficient, equitable, self-managed and sustainable exploitation of natural resources. This has been designed to build the capacity of marginal groups (both individuals and grass-roots institutions) so that they become more capable of planning, implementing and managing their own development and negotiating improved entitlements. The Programme is being implemented in 3 phases in 30 of the most backward blocks in 7 districts of Orissa over 10 years. The project cycle of 7 years will be completed by 31st December, 2011 in Phase I area of OTELP.

According to the suggestions of the Joint Review Mission, a MoU between OTELP and OPSL has been signed for up-scaling strategy for Agriculture and Horticulture development in Phase I areas of OTELP in Koraput, Kandhamal, Kalahandi & Gajapati districts. As per agreement, the Association is from 15th Sep, 2010 to 14th Set, 2011.The consultants of OPSL have facilitated the assignment as per agreement through the support of FNGOs, ITDAs and PSU in two cropping seasons (Rabi, 2010-11 and Kharif, 2011).

1.2 Strategic interventions during 2009-10

The interventions that have become successful on a pilot scale are crop diversification, inter-cropping, sequential cropping under rainfed situation, multiple cropping in irrigated areas, introduction of new crops and varieties, seed production, adoption of low monetary system, system of rice intensification, millet development, off-season vegetables, hybrid maize cultivation, kitchen garden in back yards, micro-irrigation system, use of low cost implements, adoption of non-chemical agriculture, dryland horticulture etc. Basing on the experience, the up-scaling strategy for Phase I areas of OTELP was prepared and implemented from Rabi, 2010.

1.3 Approaches to implement up-scaling strategy

Inception workshops were conducted at the state and district level to sensitize the OTELP personnel working at ITDA level, FNGOs and line departments about implementation of the up-scaling strategy and convergence with line departments. Three State level consultants on agriculture, horticulture & NRM and four district level specialists were positioned by OPSL to facilitate the implementation. The up-scaling strategy was formulated in consultation with the VDCs/FNGOs by the OPSL which was approved by the PD, OTELP and communicated to ITDA of Paralakhemundi, Th Rampur, Baliguda and Koraput for execution. Required funds were released to the VDC/FNGO by the ITDA for purchase of inputs. Handholding support was given to the FNGO and VDCs by the district specialists of OPSL and State level consultants. Periodic review of the progress was made by the PD, OTELP. Training of

the trainers and training to the VDC members were given by the district level specialists basing on the course module and IEC materials developed by the State Consultants. The district specialists and State Consultants of OPSL were regularly making field visits to the Phase-I areas of OTELP to provide handholding support to the FNGOs/WDTs and VDCs.

1.4 Physical targets

The physical target that will be achieved during Rabi, 2010-11 and Kharif, 2011 was communicated by the OTELP to the OPSL. Basing on the target communicated the Rabi action plan was prepared by the OPSL and communicated to all concerned for implementation. After the Rabi Programme was over the Kharif programme was prepared in consultation with the VDC and the FNGOs and communicated to the PD, OTELP for making arrangement for supply of critical inputs.

Sub-sector	Suggested intervention	Unit	Target
Agriculture	Crop diversification	Household	25%
	Inter cropping	HH	10%
	Sequential cropping	Ha	500
	Multiple cropping	Ha	500
	Introduction of new crop and varieties	Ha	100
	Seed production	HH	2000
	Seed Replacement Ratio	%	10
	System of Rice Intensification	HH	300
NRM & SA	Use of bio-fertiliser	HH	2000
	Use of green manure	Ha	500
	Production of vermicompost	Units	500
	Use of pot manure	HH	500
	Integrated Pest Management	HH	1500
	Use of low cost implements	HH	1000
Horticulture	Area expansion		
	Fruit crops	Ha	500
	Plantation crops	Ha	100
	Nutrition garden	HH	15000
	Micro irrigation	HH	1500
	Distribution of vegetable kits	No	15000
	Tuber crop cultivation	Ha	100
Production & Income	Productivity enhancement Income enhancement	% %	10 10

2. Achievement during *Rabi*, 2011

2.1 Up-scaling Strategy

Basing on the successful interventions made during 2009-10 for Agriculture and Horticulture development in OTELP districts the up-scaling strategy for *Rabi*, 2011 was prepared in a participatory mode. The broad areas in the field of agriculture, horticulture and NRM were decided for the First Phase areas of Koraput, Kalahandi, Kandhamal and Gajapati districts as indicated below

S.No	Sub-sector	Strategic interventions
1	Agriculture	• Additional area achievement through crop diversification in uplands, inter cropping, sequential cropping, multiple cropping in irrigated areas and introduction of new crop varieties • Seed production of rice, pigeonpea, ragi, chickpea, groundnut, and improvement in seed replacement rate • System of rice intensification
2	Horticulture	• Area expansion under fruit and plantation crops • Nutrition garden and kitchen garden Micro-irrigation • Growing of tuber crops
3	NRM	• Integrated nutrient management through use of bio-fertilisers, vermicomposting, pot manure etc. • Integrated pest management through use of seed treating chemicals, neem seed extract and bio-pesticides • Use of low cost agricultural implements

2.2 Rabi Action Plan

Basing on the resources available and the successes achieved last year on a pilot scale the *Rabi* action plan was drawn for four programme districts which were covered in the first phase. The physical targets were fixed as follows:

Crop/Activity	Unit	Targets for programme districts				
		Koraput	Kandhamal	Gajapati	Kalahandi	Total
Agriculture						
HY Paddy	Ha	349.20	160.00		229.80	739.00
SRI	Ha		2.00	71.25	98.40	171.65
Ragi	Ha	97.20		80.25		177.45
Wheat	Ha	3.20	0.20		1.60	5.00
Maize	Ha	88.80	2.00	67.00	40.00	197.8

Crop/Activity	Unit	Targets for programme districts				
		Koraput	Kandhamal	Gajapati	Kalahandi	Total
Field pea	Ha	37.00		115.30		152.3
Gram	Ha	54.40	10.00	21.95	102.70	189.05
Blackgram	Ha	52.60		105.05		157.65
Greengram	Ha		2.00	26.70	35.80	64.50
Lentil	Ha				66.20	66.20
Groundnut	Ha	70.40		38.25	58.40	167.05
Sunflower	Ha	38.20	12.00	100.30	148.50	299.00
Sesame	Ha	18.80		28.50		47.30
Sub-total	Ha	809.80	188.20	539.30	906.70	2444.00
Horticulture						
Cole crops	Ha	61.92	0.40	33.70	119.00	215.02
Bean	Ha	37.00	010		21.80	68.8
Potato	Ha	103.90	15.00	20.00	48.50	187.4
Tomato	Ha	85.40		49.45	76.20	211.05
Cucurbits	Ha	13.40		1.05	29.00	43.45
Garden pea	Ha	23.80				23.8
Brinjal	Ha	69.20		52.55	88.90	210.65
Okra	Ha	26.80			23.10	49.9
Cowpea	Ha			43.00	12.10	55.1
Beet/carrot	Ha			1.00	10.60	11.6
Chilli	Ha	26.05		13.05	59.20	98.3
Garlic	Ha	33.80	0.40	5.00		39.2
Coriander	Ha				4.30	4.3
Leafy vegetable	Ha	0.66			10.50	11.16
Small gourd	Ha	2.90				2.9
Sub-total		484.83	25.8	218.8	503.2	1232.63
Kitchen garden kits	HH	2227	833	863	1570	3493
Banana	Ha				15.80	15.80
Papaya	Ha			3.00	9.12	12.12
NRM						
Bacterial culture	Kg		50	900	1000	1950
Vemicomposting	Units	104			234	338
Seed Treating	Kg		20	40	9	69
Bio-pesticides	L		60	300	75	435
Pot manure	HH	395				395
Implements						
STP (KB Pump)	No.	114				114
Drum kit	No.	261			795	1056
Bucket kit	No.	579				579

2.3 Key Successes

2.3.1 Agricultural Development

Sequential cropping

Sequential cropping is a pattern of multiple cropping in which one crop follows another on the same land, either with or without a break, in successive seasons. Much importance was given on sequential cropping to increase the cropping intensity of the adopted blocks. It was targeted to achieve 2444 ha under second crop followed by the first crop taken during the *Kharif* , 2010 against which 1253 ha was covered under the food grains (rice, maize, ragi and pulses) and 638 ha under oilseeds (mustard, groundnut and sunflower) during the Rabi season. Critical inputs were supplied to the farmers along with transfer of appropriate technology to scale-up the coverage and productivity. Growing crops in sequence in non-irrigated and irrigated situations has encouraged other farmers practicing monocropping in the area to have two or more crops in their crop fields.

Bengal gram grown after rice, Kalakupa Langigarh, Kalahandi

Ragi-country bean, Bariabhata, Bandhugaon, Koraput

Rice-tomato/ cabbage/ maize, Bandhugaon, Koraput in collaboration with ATMA, Koraput

Rice-ragi/ vegetables, Sour, Nuagad, Gajapati

Innovative systems under irrigated condition

The tribal farmers have become more innovative in case of intercropping system under irrigated condition. Instead of growing pure garlic, they have grown mustard and radish as intercrops with it. Sunflower has been grown with tomato, radish, groundnut and ragi. When asked about growing of ragi with sunflower, a tribal woman replied that the water requirement of both the crops is same so that there is no difficulty in raising ragi with sunflower. Radish is a common catch crop grown as an intercrop with different cole crops (cabbage, cauliflower, knolkhol).

Ragi planting within sunflower, Sour, Nudged, Gajapati

Radish as a catch crop with tomato and cabbage in Gajapati district

Sunflower+tomato+radish, Bariabhata, Bandhugaon, Koraput

Garlic + mustard, Ledriguda, Laxmipur

System of Rice Intensification (SRI)

System of Rice Intensification (SRI) is emerging as an alternative to conventional water and chemical intensive rice cultivation. To save water and fertilizer, SRI is being popularized as one of the resource conservation technologies (RCT). It is very popular in the district of Gajapati in the tribal predominant blocks and partly in Koraput and Kalahandi. The farmers expressed that more area could be brought under rice cultivation due to saving of water by SRI method. They also get higher yield than the conventional method of rice cultivation. The final product can be sold as organic rice as it is grown without application of chemical fertilizer. Against an ambitious target of 172 ha the achievement was 77 ha.

Line planting of summer paddy in Gajapati

Early stage of SRI in Gajapati district

Tribal Farmers of Gajapati using marker for SRI

Rabi maize cultivation

Maize, the queen of cereals, has high yield potential with limited resource use. It is gaining popularity among the tribals. The Koraput tribals are more interested to cultivate maize in *Rabi* season in place of rice to save water and get high return. Against the target for 197 ha the achievement has been 194 ha.

Maize + cabbage, K. Gurusi, Bandhugaon Koraput

Maize + tomato, Bariabhata, Bandhugaon Koraput

Paira cropping

Pulses such as greengram, blackgram, and field pea and Bengal gram are being grown in more area in Gajapati, Kalahandi than Koraput and Kandhamal under *paira* cropping. The seeds are usually sown in saturated soil condition before two weeks of harvest of Paddy crop.It is a form of relay cropping which does not require land preparation for the second crop and the *paira* crop establishes well before the soil moisture is reduced.

Paira cropping of green gram, Rayagada Gajapati

Paira cropping of pulses in Th Rampur Block, Kalahandi

Sunflower cultivation

Among the oilseeds, the area under sunflower is increasing being next to mustard. The crop is also intercropped with vegetables, groundnut, radish and Ragi. The tribal farmers have started preferring sunflower as it has good quality oil and the production of the crop is very high. With the availability of sunflower hybrids the yield has increased.

Sunflower in Lanjigarh, Kalahandi Lanjigarh Block

Sunflower mixed with field pea in Lanjigarh

Mustard and vegetables grown after Paddy

Tribal farmers of Laxmipur growing sunflower

Efficient crops in shifting cultivation area

Growing of pigeon pea (Arhar), cashew and castor are considered as some of the outstanding crops to cover the hill slopes. Pigeon pea & cashew are grown extensively from the top to bottom of the slope and provide beautiful canopy to control the erosive action of the raindrop. Collective marketing of the produce of these crops and value addition through processing can generate more employment and income.

Pigeonpea grown in hill slope, Lanjigad

Cashew plantation in hill slopes of Guma block, Gajapati

Seed preservation

Cowpea (Kating/Aladi) is grown by every tribal family during the rainy season which is harvested both as vegetable and seed. During September, the seeds are harvested but are affected by fungus due to untimely rain and become unfit as seed. The tribal women were trained at Tidipadar to keep the good seeds and discard the rotten ones. It will increase the quality of their own seed and reduce the dependence on outside seeds. The farmers were persuaded to exchange the seeds among themselves through the barter system.

Vegetable type pigeon has been introduced in OTELP area after getting seed materials from ICRISAT. The farmers are selling the raw pods @ Rs 20/kg. Since the crop will be grown in more area during next Kharif the farmers have been motivated to preserve seeds.

2.3.2 Horticultural Development

Resources are available for growing year-round vegetables in OTELP areas. Since the tribal farmers are growing vegetables in a non-chemical method the vegetables are nutritious, safe and can fetch premium price. The fruit and spice crops grown in the tribal area are having special qualities. Hence priority was given to up-scale the achievements in Phase I areas.

Intensive vegetable cultivation

Seasonal vegetables and off-season vegetables are cultivated extensively in OTELP areas. New varieties, new crops and new technologies were given to the farmers for intensive cultivation of vegetables. The vegetables like potato, cabbage, cauliflower, knolkhol, tomato, brinjal, beans, garden pea, radish, carrot, cucurbits were cultivated in the programme areas. Low cost technologies like use of pot manure, bio-pesticides, low cost micro-irrigation systems were adopted to make the vegetables safe and productive. Against the target of 1090 ha, the achievement up to February, 2011 has been 802 ha.

Group farming of vegetables in DangarpadarVillage in Tumudibandha Block

Somanath Dani of Ledriguda in Laxmipur Block

High yielding country bean selected by farmers of Attari, Kotagarh

Kufri Jyoti var of potato in Ledriguda Laxmipur

Cabbage crop in Sauri village of Gajapati

Tribal women marketing their produce

Kitchen gardening

With a view to ensuring food and nutrition security of tribals focus has been given on production of food grains, oilseeds, vegetables and fruits. Kitchen garden kits containing seven types of vegetables seeds were supplied to poor households for kitchen gardening in their backyards. Against the target of 3493 kits 10678 kits have been supplied to the farmers for kitchen gardening. The vegetables so produced will not only meet the family requirement but also the surplus will be sold in the market to supplement the family expenditure.

Kitchen garden in Jubaguda (Kotagarh)

A farmer of Gajapti in his kitchen garden

A tribal lady of Gajpati in her kitchen garden

Farmers of Jubaguda (Kotagarh) taking up Group farming

Fruit crops

During *Rabi,* 2011 achievement under fruit plantation was only 3.65 ha of banana. However, papaya and banana were planted in backyards by some tribal farmers. The area to be covered under fruit plantation has been selected. After arrangement of grafts/seedlings, fruit plantation will be taken up during coming season. With the introduction of several improved and hybrid papaya varieties the crop has established in all OTELP areas as a pure crop, in kitchen gardens and backyard areas. Fruits of papaya provide good food and nutrition and farmers say that the crop grown easily, tolerate drought, live longer, yield fruits quickly, produce a heavy yield and marketed easily. Fruits are used both for vegetable and dessert.

Hybrid papaya cultivation in Tidipadar (Tumudibandha Block)

Growing a non-traditional crop proved to be more profitable as seen in Dhanua Chilli cultivation. Bipin Jani of Tidipadar under Raniadu VDC has grown Dhanua Chilli along with Banana, Papaya, Tapioca. Dhanua Chilli is sold at the rate of Rs. 800 to 1100 per Kg. There is no problem in disposal of the produce. The plant survives for more than three years and can yield around 200gm per plant/ year. He has planned to grow Dhanua chilli in more area in coming years.

Bipin Jani of Tidipadar in his Dhanua Chilli field


Tissue culture banana in Bandhugaon Block Vegetable cultivation using Bio-pesticides

2.3.3 Natural Resource Management

Focus has been given for conservation of natural resources in OTELP programme areas. As a part of sustainable agriculture Integrated Nutrient Management has been promoted. Use of bio-fertilisers, vermi-compost, pot manure and green manures has been made in the crop fields to promote non-chemical agriculture. During Rabi, 2011 1690 kg of Azotobacter, Azospirillum and Phosphorus Solublising Bacteria have been used in crop fields. Similarly 73 vermi-compost units have been established for production of vermin-compost. 230 farmers have used pot manure which is a decomposed mixture of cow dung, cow urine, molasses, chopped leaves of neem, Karanj and Arakh.

For promotion of Integrated Pest Management 200 litres of bio-pesticides and 90 kg of seed treating chemicals have been used in vegetable crops during Rabi, 2011.

Low cost implements such as 521 Surface Treadle Pumps, 233 Drum kits and 551 Bucket kits have been used during Rabi, 2011 for micro-irrigation.


Farmers have used drum kits and bucket kits for micro-irrigation

CASE STUDIES

Sauri Watershed: A Role Model

Sauri village, though a small and remote village of Raygada block of Gajapti district has now advanced in many areas such as communication, education, health and agriculture. Food shortage was a problem of the villages before interventions of OTELP and lean season food scarcity was met by the forest. After OTELP intervention, Jana Kalyan Pratisthan (FNGO) constructed a masonry check dam in the village which provided irrigation to about 30 ha of land. The farmers were supported by OTELP for growing different Rabi crops like vegetables, paddy and sunflower. F1 hybrids of vegetables such as brinjal, tomato, cabbage, cauliflower, onion are grown extensively by the farmers, both men and women. Sunflower, paddy and ragi are also grown extensively in the village. The right type of technology and fertilization to crops has been adopted by the farmers. In the hill slopes pine apple and turmeric are grown with support from OTELP. Proper spacing, timely interculture, fertilization, appropriate crop combination and required plant protection are adopted by almost all the farmers, which has now a spread effect in the locality. The technologies have been replicated in near by villages. Now Sauri has become a role model for many.

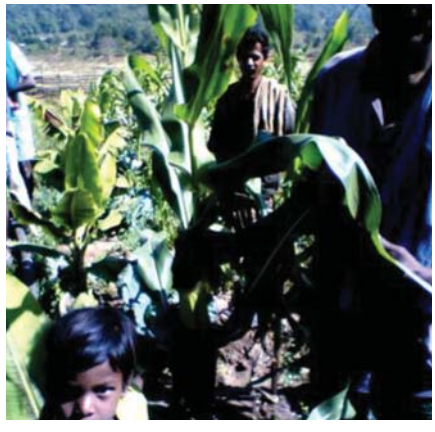





A successful case of community farming in Jubagad (Kotagad Block of Kandhamal)

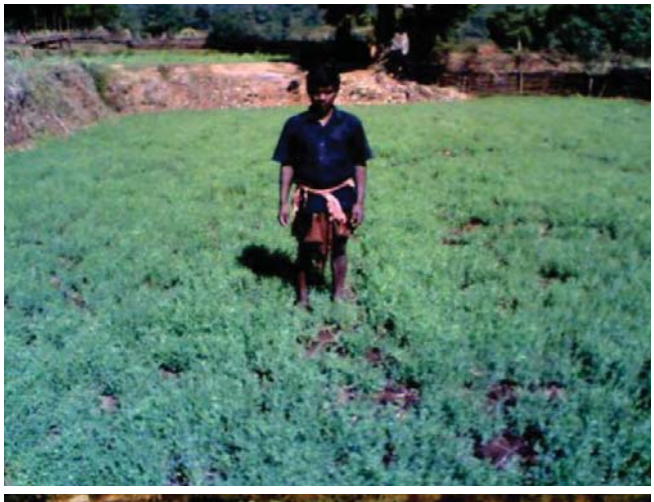
Sahid Bhagatsing Watershed was adapted by OTELP. The total households of the watershed are 510 and Jubagad village has 160. All the villagers belong to ST community. The villagers are deprived of many amenities as it is located at a remote and vulnerable place. OTELP constructed one irrigation project and farm pond in the village with the assistance of Jagruti. Rs 58 lakh was given to VDC and 33SHGs and 7 UGs were formed for development activities. The villagers are growing potato and other vegetables intensively during Kharif and Rabi with OTELP support. Maize is being cultivated in the village with support of Agriculture Department. The villagers like Manku Patmajhi, Rasana Patmajhi are leading farmers of the village. Best management practices in vegetable cultivation have been adopted by the farmers. They have been trained to use bio-fertilisers to use in vegetable crops. The farmers have good market for their vegetable crops and got a return of about Rs 80,000 to Rs 100,000 by investing around Rs 30000 per ha.





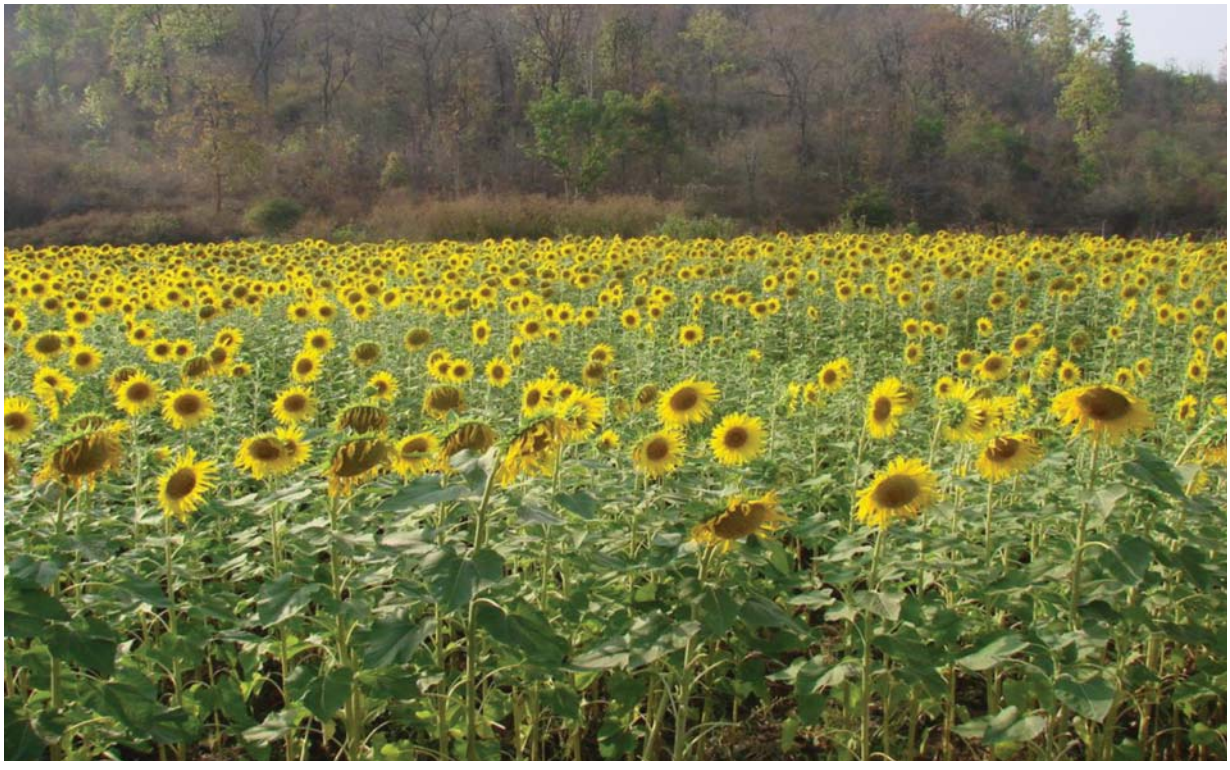

Successful mixed cropping of pulses and oilseeds during Rabi in Punjiama village (Lanjigad Block)

One can see many types of mixed cropping during Kharif. But mixed cropping is rarely seen in Rabi crops, particularly in tribal areas. Maa Tarini SHG was supported by OTELP for undertaking various income generating activities. The group received Rs 20000 as RFS from OTELP and started forest nursery and cropping, Potato mixed with tomato and sunflower mixed with pea were taken up by the farmers. Sunflower hybrids have become successful in the village and the farmers get about 7.50 q/ha which they process at Kalyansingpur of Raygada Block, One kg of oil is produces from 3 kg of seed. A portion of oil is used by the families and the rest sold at market @ Rs 50-60 per litre.




Sunflower cultivation in Kalakopa (Lanjigad): An eye opener

Kalakopa is a small village of Lanjigad block with 105 households. There was no Rabi cropping before due to stray cattle menace. With the support from OTELP and assistance of the FNGO the farmers of the village started Sunflower cultivation during Rabi in an area of 10 acres. Bamboo fencing was provided around the fields and irrigation was made available from a defunct MIP. The cultivators used hybrid seeds and applied fertilizer for the crop growth. The has been excellent and the farmers except 6-8 quintal of seed per hectare. The hard labour put by the farmers has reflected in a bumper crop and no one can believe this without seeing the village.



Success of Tidipadar in Rabi cultivation (Tumudibandha block)

A small village with 16 households has achieved a milestone in vegetable cultivation with the support of OTELP and assistance of PRADATA (FNGO). With the support of OTELP irrigation system was developed in the village, the villagers have started vegetable cultivation with assistance of OTELP. Cabbage, cauliflower, radish and potato have been taken up. The women SHGs have been trained to raise vegetable seedlings for cultivation. A fish tank has been constructed by spending Rs 1 lakh. The WSHG has started fishery in the tank and they expect 40-50 kg of fish this year. In the village forest mango, teak and Simaroba have been planted. In the kitchen garden vegetable crops have been grown for household food security.




Illumination of a tribal village Karnibel (Th Rampur)

Maa Adimata VDC was formed by OTELP with assistance of Gram Vikash. Karnibel is a small village with 16 households Irrigation and hydro-power generation by using turbines were developed in the village. An addition to getting electricity the farmers have started cultivating different types of vegetables such as potato, brinjal, tomato, cauliflower and cabbage have been grown. Mango grafts were given to the farmers for planting which they have done with care. The villagers are now able to take seasonal vegetables as per their requirement and the surplus is sold in the market.