

Technical Protocol Documentation

Name of the PIA: Organisation for Rural Reconstruction & Integrated Social Service Activities (ORRISSA)

Districts: Malkangiri & Kandhamal districts of Odisha



Particulars	Operational Area		
		Malkangiri	Kandhamal
Agro-climate		Malkangiri comes under South-eastern Ghat Zone. The climate of the district is warm and humid.	Kandhamal comes under North-eastern Ghat Zone and climate is hot & moist, sub-humid.
Soil condition		Red, Lateritic, Black	Brown forest, Lateritic Alluvial, Red, Mixed Red & Black
Cropping pattern		<p>The important crops during Kharif is paddy, Millet, Pulses, maize, green gram, ground nut and sesame .</p> <p>In Rabi season, the irrigation potential is very negligible and farmers grow maize, green gram, ground nut</p>	<p>The irrigation potential of the district is 12 % during Khariff and 4.7% during Rabi season. The important crops of the district during Kharif season is Paddy, Maize and Niger.</p> <p>During Rabi Season, the irrigation potential is very limited as such, Rabi Crops are grown mostly under available moisture condition. In irrigated areas, crops like Potato, Vegetables and Mustard are grown.</p>
Major crops		Paddy, Pulses, Millets, maize, sesame	Paddy, Pulses, Maize and Vegetables
Major Agricultural Season		Kharif	Kharif
Sl no	Major Agricultural Activities	Practices (Please mention the name of specific practice/method/substance/equipment used)	Training module developed (write yes/ No)
1	Pre-Cultivation		
	Crop selection	<ul style="list-style-type: none"> Diversified and locally suitable crops would be identified by farmers Mixed cropping systems, intercropping and crop rotation systems Based on climatic conditions and available resources, the crops would be identified 	Text version ready and complete module is being developed
	Variety (resistant variety / Improved variety etc)	<ul style="list-style-type: none"> Drought resistance variety Pest resistance variety 	
	Source of Seed (own /purchased etc)	<ul style="list-style-type: none"> Farmers own seed (would be multiplied through seed exchange) 	

	Seed selection	<ul style="list-style-type: none"> • Rare variety/ resistance variety seeds would be exchanged/purchased from farmers • Identification of locally available and suitable varieties based on farmers experience • Identification of drought resistance varieties and multiplication through farmers • Identification and multiplication of pest resistance varieties 	
	Seed rate	<p>Paddy- 90 kg/ha Finger millet- 10 kg/ha Pigeon pea- 20kg/ha Green gram- 25kg/ha Kalajira Rice- 60 kg/ha</p>	
	Seed Treatment	<ul style="list-style-type: none"> • Soak seeds for 6-12 hours and properly dry under sun during summer month • Use healthy disease-free seeds • Water 20 litres, Desi Cow dung-5 kg, Desi Cow urine-5 litres, One handful of soil from the surface of field, lime 50 grams. The above mixture can be used to treat seeds, seedlings or any planting material. The planting material has to be simply dipped in the mixture, taken out and planted. This mixture protects the crop from harmful soil borne and seed borne pathogens during the initial stages of germination and establishment. 	
2	Cultivation Spacing Sowing/ Transplanting	<p>25cm X 25 cm</p> <ul style="list-style-type: none"> • In upland, paddy and millets sowing • In low and medium land, traditional transplantation and line transplantation • Mixed cultivation field- Broad vesting as well as transplantation 	Text version ready and complete module is being developed
	Intercultural operations (weeding, thinning, etc)	<ul style="list-style-type: none"> • Summer ploughing • land preparation • hoeing & weeding twice at 21 & 42 days 	
3	Water conservation and Methods of water conservation	<p>water management</p> <ul style="list-style-type: none"> • In-situ measures to increase moisture conservation (tillage and mulching) • Proper drainage in low lands for better 	Text version ready and complete module

	<p>Methods of irrigation Plan of irrigation (irrigation at critical periods etc)</p>	<p>aeration and root growth</p> <ul style="list-style-type: none"> • Dry land Mix crop method to manage the dry spells and retain production. • Portable water use based on crop type 	<p>is being developed</p>
4	Soil fertility Mgmt. /Soil health enrichment and crop nutrient management		
	<p>Bio-fertilizer /Organic Manure/ Green manure crops etc</p> <p>Methods of application/Practices</p> <p>Duration/ Scheduling of application</p> <p>Micro nutrient management Methods of enhancement of soil biomass</p>	<ul style="list-style-type: none"> • FYM, vermin compost, Green manure, Handi Khata, Agniastham, Neemastham, liquid manure, cattle-dung and urine extract • Introduction of leguminous crop in crop rotation and in mixed cropping wherever suitable • Spreading of FYM @ 5-6 t/ha or Vermicompost 2-3 t/ha before sowing • After transplantation, spray Neemastham/liquid manure, cattle-dung and urine extract • Using FYM/Vermin compost before sowing • During standing crop, liquid manure, cattle-dung and urine extract, Handi Khata, Agniastham, Neemastham, • Soil Sampling and testing • Application of liquid manure, FYM • Recycling bio mass into soil (Green manuring, Glaricidea leaf application, application of other plant residues) • Using the virgin forest soil to multiply valuable micro nutrient in the Liquid manure and compost created by the farmers. 	<p>Text version ready and complete module is being developed</p>
5	Insect/Pest/Management		
	<p>Insect/ Pest control methods/ practices (E.G. If NPM, please specify particular method of control under NPM)</p>	<p>IPM Methods</p> <ul style="list-style-type: none"> • Liquid manure • Neemanstham: used for stem borer, leaf folder, Brown plant hopper, Paddy blast etc. • Agniastham: used for stem borer, <p>NPM Methods</p> <ul style="list-style-type: none"> • Deep summer ploughing: Summer ploughing exposes the pupæ surviving inside the soil. Depth of ploughing 	<p>Text version ready and complete module is being developed</p>

should be more than 6 inches. Exposed pupae will die due to excess heat (or) eaten away by birds

- Seed Treatment: Water 20 litres, Desi Cow dung-5 kg, Desi Cow urine-5 litres, One handful of soil from the surface of field, lime 50 grams. The above mixture can be used to treat seeds, seedlings or any planting material. The planting material has to be simply dipped in the mixture, taken out and planted. This mixture protects the crop from harmful soil borne and seed borne pathogens during the initial stages of germination and establishment.
- Intercropping
- Clipping of the tips: Cut seedling tips while transplanting into the main field. This will prevent Stem borer attack as Stem borer lays eggs on the tips of the leaves.
- White and Yellow sticky traps: Arrange 15-20 Yellow and White sticky traps per acre. Green leaf hoppers and thrips stick to these traps. Clean these traps once in two days and add sticky material to traps for effective trapping. Height of these traps should be the same with the plant height.
- Bird perches: Arrange 10-15 bird perches per acre immediately after transplanting and remove these at grain filling stage (60 days after transplanting). Bird perches will attract birds and birds will eat pests. Broadcasting of yellow rice will attract more birds. Height of bird perches should be more than the height of plants.
- Pheromone traps: Keeping 5-10 Pheromone traps in zigzag way to mass trapping of Stem borers. Lure has to be changed once in a month or after the expiry date.
- Use disease and insect free pure seed.
- Rotate crops particularly with pulses to prevent disease spread.

	Insect/ Pest control substances(biopesticide/ others etc)	<ul style="list-style-type: none"> Rice seedlings should be free from weed seedlings at the time of transplanting. Proper water management (alternate wetting and drying to avoid water stagnation) in planthopper, bacterial blight and stem rot endemic areas. <p>Pest management : Protection of natural habitats within the farm boundary may help in conserving natural enemies of pests. Management of farmland and trees is important as they provide habitat for beneficial insects and birds which control insect pests. Similarly, cats help in the control of rats. Field bunds provide retitse for predating spiders which help in the control of several rice insect pests. Bunds should be kept clean by removing weeds so as to reduce the inoculums of disease like sheath blight.</p>	
6	Disease Management		
	Disease control methods/ Practices	<ul style="list-style-type: none"> Cow dung-5 kg, Cow Urine- 10 litres, Neem leaves-10 kg, Water 200 litres. This mixture is particularly effective against aphids, jassids, mealy bugs and white flies. Foliar spray of cow dung slurry is also effective for the management of bacterial blight of rice. Fresh cow dung @ 20 g / litre is mixed in water and the supernatant is used for spraying. 500 litres of cowdung liquid is needed for one hectare 	Text version ready and complete module is being developed
	Disease control substance (bio fungicide/others)	<ul style="list-style-type: none"> Foliar spray of cow dung slurry is effective for the management of bacterial blight of rice. 	
7	Harvesting (Methods of harvesting)	<ul style="list-style-type: none"> Maintaining correct time of harvesting: the correct time to harvest is 1 week before the maturity date Cutting the rice stalk Reaping the panicles Laying out the paddy-on-stalk or stacking it to dry Bundling for transport. 	Text version ready and complete module is being developed
8	Practices for improving Agro	<ul style="list-style-type: none"> The traditional adivasi cropping practices have an established practice components 	

	ecological services (bringing tree component / Bio diversity etc)	in this genre. The traditional Mix Crop practices are being done inside the forest and now the families have domesticated certain food value forest species into their regular farms. Besides this the adivasi farmers use the virgin micro-organisms from the un-disturbed forest soil in the Liquid Manure as well as compost to bring in the ecological services to their farms and protect the village forest to support the life cycle of the local bio-diversity vis-à-vis their livestock and land.	
9	If the PIA have any post harvest technology regarding storage of food grains, Seeds, value addition, please specify	<ul style="list-style-type: none"> • Before storing grains are spread over a mat for sun drying. The seed is never spread on the cemented floor. According to the farmers, if it is spread on cemented floor directly, the heat generated from the surface reduces the viability of the seed. It was also observed that the percentage of broken rice increases if paddy is dried on the cement floor. The grains are allowed to cool down overnight, before packing. Only after proper cooling, grains/seeds are filled in the storage devices. • The grain is stored in freshly cleaned and polished utensils. The new utensils are exposed to smoke before use, for atleast a month, to make them durable, as well as, pest free. After pouring the grains inside, the pot is sealed with a lid made from cow dung and red soil, to prevent the entry of dust and moisture. The grain stored by this method remains fresh for years, if kept away from direct moisture and rodents. • Several plants and plant parts are extensively used by the farmers to control storage pests of paddy. Some of the widely used ones are leaves of Vitex, Neem, Camphor, Artemisia and Walnut. The dried leaves of above listed plants are spread at the bottom, center, as well as, on the top of the storage device, in layers. 	The traditional methods are being appropriated

- Ash can be used for proper storage of seeds. Ash is spread over the paddy grain.
- The straw is stored on the tree branches. It is used as fodder for cattle in the dry season, to protect nursery plants from frost, as a filling material and to make hats, ropes, cushion or mats etc. Straw is also being used for covering the vermicompost pits or as a mulch for root vegetables and spices