

Enhancing Land and Soil Productivity, Biomass Intensification and Dry land horticulture

The Mandal has predominantly red soils (71%) with low clay content, followed by black soils. Salinity

Soil type	Cultivable Area in acre	% of the total	Soil depth range	Slope range	Erosion status	Soil problems
Red soils (With low clay content)	11284	71.1	Shallow to medium	Medium to high	medium to high	Seepage and low moisture holding
Black soils	3128	19.8	Shallow to moderate	Low to moderate	Medium to high	Drainage
Saline soils	1439	9.1	Shallow to moderate	Low to moderate	Medium to high	Infiltration, Plant growth and fertility

The red soils predominant in the Mandal have low organic content resulting into frequent crop failures. Low soil depth and impermeable layers sub-surface, low infiltration and erosion are generic problems in black soils. Salinity is one of the major problems affecting about 9% of the area in the Mandal. Drainage is also a problem in some of these soils with heavy rains.

Frequency of crop failures:

Kharif Year	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Status of crop failure	Failure	Good	Failure	Good	Failure	Failure	Good	Failure	Failure	Failure

The Mandal has only 3 years of good crop season in the last 10 years. The failure ranges is moderate to high; which often leaves farmers with either breakeven (moderate failure) or in to loss (severe failure).

Issues of Concern:

1. Declining and low quantities of application of FYM in rain fed agriculture lands and increasing dependency on chemical fertilisers.
2. Tendency towards mono-crops and declining practices in crop rotation.
3. Burning of crop residues.
4. Decline in the practice of lopping Pongamia branches and their incorporation into paddy lands; some farmers are even uprooting the trees!
5. No access to soil testing (only sporadically taken up by the Agri Department)..the nearest lab is 100 km away.

6. Increasing salinity in tank command and rice areas

Constant addition of Biomass to soils is an important requirement for moisture management, nutrition and soil health. Conversion of existing biomass (from various sources) into compost using dung as a medium is important i.e. achieving high Biomass to Dung ratio manures. It is premised that increasing biomass availability, establishing composting facilities and getting farmers to practice composting for at least three years helps in establishing this as a regular practice; if required farmers are to be incentivised for a period of three years

Focused and total investments in multi-purpose biomass regeneration are crucial for NRM and agriculture. Its important to have continuous augmentation of biomass through seed dibbling, planting, protecting, watering etc. Biomass is required for soils, as tree fodder, for fuelwood and for produce for sale from commons. All the niche areas for biomass intensification need to be targeted.

Dryland horticulture as standardised in Anantapur and Tree Based Farming Systems promoted by BIRD-K in Tiptur and Agri-Biotech Foundation/ SDDPA in Mahabubnagar are good examples in farm diversification.

RRA-CP program intends to promote a package of measures in soil fertility enhancement through composting, Biomass intensification and dry land horticulture by providing watering and protection et., integrated into the soil fertility enhancement and biomass intensification.

This is expected to result in increasing the addition of organic matter, intern results in moisture holding capacity; increasing the biomass availability and dry land fruit crop in a contiguous area.

RRA-CP will open up the following package to the farmers:

Package-In contiguous area of not less than 10ac, composting, plantation of biomass plants, dryland horticulture can be taken up. It will support for three years programs.

Farmer end: Farmers of contiguous area (not less than 10ac) who are willing to take up this initiative has to submit the resolutions on below points

Soil fertility:

- Farmer has to collect biomass and cow dung and transport it to compost pit.
- Farmer can take Brush cutter and Chipper on hire basis to make it into pieces
- S/he has to do turning over of the biomass twice in three months.
- They have to show water source for watering
- They have to mention the plant protection mechanism explicitly
- If mortality of the plants are more than xx% (more than normal), farmers have to pay the cost of the plants to the Coop

From NREGA :

- Digging of compost pit, filling up of compost pit, planting plants around the pit and watering can be done for three years

Biomass plantation and dry land horticulture: Biomass plantation can be taken up on bunds and land which is not suitable to agriculture; 40 or 60 plants per ac. Dryland horticulture plantation also can be taken up i.e 70 plants per ac.

From project/NREGA: Plant cost, pitting, planting, and watering

Shrama Shakthi Sanghalu – one SSS can work for 50-60ac and it will help them to get assured wage days

Payment system – Payment will be given to farmer. Field assistants and TAs will be engaged.

Process will be adopted for dry land horticulture program under NREGA in Anantapur

Summery budget for MGNREGA:

SI .No	Description of Item /Task	Qty	Units	Rate (Rs)	Total Qty	Total Amount
1	Biomass Based Manures					
2	Preparation of compost from pits-At homestead - one time	1	No	3049.492	1500	4574238
3	Preparation of compost from pits-At farm - one time	2	No	12252.432	11000	134776752
4	<i>Collective composting site</i>	1	No	3049.492	750	2287119
5	Tank silt application (50 cu, m/ac)	1	Ac	10055.5	5000	50277500
6	Bund plantation to make the biomass availability :(Multi purpose plants planting on bunds/ boundary (Biomass 50, Fodder 50 ,Timber 50 Total 150 plants per acre)	1	Ac	20086.5	6000	120519000
7	Dryland Horticulture	1	Ac	62000	1500	93000000
	TOTAL			110493	25750	405434609

*For Compost pit, Bund plantation and Silt application unit rates has taken from MGNREGA and Dryland Horticulture from IWMP; Take new RSSR rates for Compost processing (*Detailed estimate can be seen Annexure 1, 2, 3 & 4*)

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Annexure -1: Detailed Estimation of Biomass based Compost pit and composting

Sl .No	Task code	Description of Item /Task	Qty	Units	Rate (Rs)	labour Component Unskilled (Rs)	labour Component skilled /Semi skilled (Rs)	Material Cost (Rs)	Total Cost (Rs)	Person days
1	7261	UNSKILLED LABOUR Charges for earth work excavation in ordinary soil and depositing excavated soil away from the compost pits	7.2	CU.m	137	986.4	0	0	986.4	7.20
2	7262	UNSKILLED LABOUR Charges for earth work excavation in Hard soil and depositing excavated soil away from the compost pits	7.2	CU.m	154.11	1109.592	0	1	1109.592	8.10
3		Plants around pit								
4	15019	UNSKILLED LABOUR charges for digging of 45 cm cube pits in Hard Soil	50	NO	10.61	530.5	0	0	530.5	3.79
5	16050	UNSKILLED LABOUR charges for alignment and fixing planting with o.45mt length sticks including cost and conveyance of sticks	50	No	0.99	49.5	0	0	49.5	0.35
6	16051	Transportation and internal transportation of 6 X 12 bag plants upto 5km lead including loading and unloading	50	Nos	1.05	0	0	52.5	52.5	0.38

7	16052	Transportation of 6 X 12 bag plants beyond 5KM upto 100 Km lead	50	Nos	0.2	0	0	10	10	0.07
8	16053	UNSKILLED LABOUR Charges for planting of 6 x 12 bags plants in 0.45 M cube pits including saucer formation of 1 M dia	50	Nos	4.48	224	0		224	1.60
9	16054	UNSKILLED LABOUR charges for replacement of casualties upto 20% with 6 X 12 bag plants including transport of seedlings opening of pits	10	Nos	8.7	87	0	0	87	0.62
10		Biomass seed (2kg Sunhemp seed per one acre or per CP) around one pit	2	Kg	30	60	0	60	0	0.43
Maintenance I										
11	16059	UNSKILLED LABOUR charges for watch and ward including protection, weeding, soil mulching, life saving irrigations, de budding and to attend all activities which contribute to help the plant to grow as a tree Oct to Feb (5 months)_1st yr maintenance	250	Nos	2.26	565	0	0	565	4.04

12	15037	UNSKILLED LABOUR charges for watch and ward including protection, weeding, soil mulching, repairs to fence, life saving irrigations , de budding, removal of epicormic branches and to attend all activities which contribute to help the plant to grow as a tree March to June (4 months)_1st yr maintenace	200	Nos	11.32	2264	0	0	2264	16.17
Maintenance II										
13	16060	UNSKILLED LABOUR charges for replacement of causalities upto 10% with 6 X 12 bags plants including transport of seedlings opening of pits	5	Nos	8.7	43.5	0	0	43.5	0.31
14	16061	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) second year maintenance	250	Nos	2.26	565	0	0	565	4.04

15	15041	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , repairs to fence, life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) _2nd year maintenance	200	Nos	5.66	1132	0	0	1132	8.09
Maintenance III										
16	16062	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) second year maintenance	250	Nos	1.13	282.5	0	0	282.5	2.02
17	15045	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , repairs to fence, life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) _3rd year maintenance	200	Nos	4.45	890	0	0	890	6.36

		<i>Support for composting For three years (calculated as per new RSSR, 2012)</i>								
18		UNSKILLED LABOUR labour for collection of biomass 50 % by project and 50% by farmer	7.2	Cum	121	871.2	0	0	871.2	6.36
19		UNSKILLED LABOUR for preparation of compost bed with using biomass in layers of 0.25meter thick up to 4 layers, every layer should sprinkle the cow dung slurry and covered with 1centimeter thick soil layer including wetting the each layer with a 300 liters of water	14.4	Cum	45.35	653.04	0	0	653.04	4.77
20		UNSKILLED LABOUR unskilled labour for watering compost bed 200liter per bed once in week days for the period of 70 days(10 watering per pit)	10	Nos	121	1210	0	0	1210	8.83
21		Engaging bullock cart for water conveyance from 3km distance(One bullock cart can supply water to 9 compost pits daily)	1	Nos	400	0	400	0	400	2.92
22		UNSKILLED Labour for over turning of the compost bed at 25 days and 60 days	10.8	Cum	30.25	326.7	0	0	326.7	2.38
		TOTAL				11849.932	400	123.5	12252.43	88.82
		For homestead and collective site – one pit							3049.492	

Annexure-2: Detailed Estimate of Bund Plantation to make the Biomass availability

Sl .No	Task code	Description of Item /Task	Qty	Units	Rate (Rs)	labour Component Unskilled (Rs)	labour Component skilled /Semi skilled (Rs)	Material Cost (Rs)	Total Cost (Rs)	Person days
1	15019	UNSKILLED LABOUR charges for digging of 45 cm cube pits in Hard Soil	150	NO	10.61	1591.5	0	0	1591.5	11.36786
2	16050	UNASKILLED LABOUR charges for alignment and fixing planting with o.45mt length sticks including cost and conveyance of sticks	150	No	0.99	148.5	0	0	148.5	1.060714
3	16051	Transportation and internal transportation of 6 X 12 bag plants upto 5km lead including loading and unloading	150	Nos	1.05	0	0	157.5	157.5	1.125
4	16052	Transportation of 6 X 12 bag plants beyond 5KM upt o 100 Km lead	150	Nos	0.2	0	0	30	30	0.214286
5	16053	Unskilled labour charges for planting of 6 x 12 bags plants in 0.45 M cube pits including saucer formation of 1 M dia	150	Nos	4.48	672	0		672	4.8

6	16054	UNSKILLED LABOUR charges for replacement of causalities upto 20% with 6 X 12 bag plants including transport of seedlings opening of pits	30	Nos	8.7	261	0	0	261	1.864286
		Sunhemp seed								
Maintenance I										
7	16059	UNSKILLED LABOUR charges for watch and ward including protection, weeding, soil mulching, life saving irrigations, de budding and to attend all activities which contribute to help the plant to grow as a tree Oct to Feb (5 months)_1st yr maintenance	750	Nos	2.26	1695	0	0	1695	12.10714
8	15037	UNSKILLED LABOUR charges for watch and ward including protection, weeding, soil mulching, repairs to fence, life saving irrigations , de budding, removal of epicormic branches and to attend all activities which contribute to help the plant to grow as a tree March to	600	Nos	11.32	6792	0	0	6792	48.51429

		June (4 months)_1st yr maintenance								
Maintenance II										
9	16060	UNSKILLED LABOUR charges for replacement of causalities upto 10% with 6 X 12 bags plants including transport of seedlings opening of pits	15	Nos	8.7	130.5	0	0	130.5	0.932143
10	16061	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) second year maintenance	750	Nos	2.26	1695	0	0	1695	12.10714
11	15041	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , repairs to fence, life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5	600	Nos	5.66	3396	0	0	3396	24.25714

		months) _2nd year maintenance								
Maintenance III										
12	16062	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) secong year maintenance	750	Nos	1.13	847.5	0	0	847.5	6.053571
13	15045	UNSKILLED LABOUR Charges for watch and ward including protection, weeding, soil moisture , repairs to fence, life saving irrigation, de budding and to attend all activities which contribute to help the plant to grow as a tree October to February (5 months) _2nd year maintenance	600	Nos	4.45	2670	0	0	2670	19.07143
		TOTAL				19899	0	187.5	20087	143.5

Annexure-3: Detailed Estimation of Silt Application

Sl .No	Task code	Description of Item /Task	Qty	Units	Rate (Rs)	labour Component Unskilled (Rs)	labour Component skilled /Semi skilled (Rs)	Material Cost (Rs)	Total Cost (Rs)	Person days
1	6703	UNSKILLED LABOUR charges for earth work excavation of silt in Tank bed	50	Cu.m	80.47	4023.5	4023.5	0	4023.5	28.73929
2	12	UNSKILLED LABOUR charges for spreading of transported silt	50	Cu.m	16.64	832	832	0	832	5.942857
3	19319	Conveyance for silt upto lead 5 KM	50	Kms	104	0	0	5200	5200	0
		TOTAL				4855.5	4855.5	5200	10056	

Annexure-4: Detailed Estimation of Dryland Horticulture

Sl .No	Task code	Description of Item /Task	Qty	Units	Rate (Rs)	labour Component Unskilled (Rs)	labour Component skilled /Semi skilled (Rs)	Material Cost (Rs)	Total Cost (Rs)	Person days
		UNSKILLED LABOUR Charges for for soil sample testing - 1 year	1	Acre	137	137	0	0	137	
		Cost of fencing seed - first year	1	Acre	150	0	0	150	150	
		UNSKILLED LABOUR Charges for excavating of 0.9X0.9X0.9 m in Hard soil - first year	70	Nos	96.12	6728.4	0	0	6728.4	
		UNSKILLED LABOUR Chanrges for seed sowing and thorny fencing - 1st year	9	Nos	137	1233	0	0	1233	
		Plant materail cost (100%) - 1st year	70	Nos	22.5	0	0	1575	1575	
		Plant transport cost -first year	70	Nos	1	0	0	70	70	
		Cost of basal dressing with fertilizers and pp chemical for Mango (7.5) EGS +MIP I st year	1	Acre	1623	0	0	1623	1623	
		Unskilled labour charges for mixing manures and fertilizers and filling pits-1st year	70	Nos	6.16	431.2	0	0	431.2	
	11529	Unskilled Labour charges for planting and staking -1st year	70	Nos	16.44	1150.8	0	0	1150.8	
	11537	Cost of sauceature for pruning - First year	1	Nos	310	0	0	310	310	
	15063	Cost of seed under raising of inter crops - I Year	1	Acre	800	0	0	800	800	

		Cost of ploughing under raising of inter crops _ Hard- first year	1	Acre	1000	0	0	1000	1000
15064		UNSKILLED LABOUR Charges for weedeing in intercrops twice in - I Year	2	Nos	410.99	821.98	0	0	821.98
11510		Cost of Top dressing with fertilizer and PP chemicals for Mangi (7.5m) EGS+MIP - first year	1	Acre	2072	0	0	2072	2072
11536		UNSKILLED LABOUR Charges for Top dressing - application of fertilizers and PP Chemicals twice- first year	2	Nos	310	620	0	0	620
		UNSKILLED LABOUR Charges for Basin preparation upto 0.5mts radius under raising of inter crops - first year	70	Nos	9.59	671.3	0	0	671.3
1616		UNSKILLED LABOUR Charges for watering mango plants 20 times beyond a distance of more than 30mts from the field_ Mango (7.5m)_ Dryland-first year	20	Times	340	6800	0	0	6800
		UNSKILLED LABOUR Charges for digging of compost pit of 5.2X2X1m size - first year	1	Nos	1095.97	1095.97	0	0	1095.97
		UNSKILLED LABOUR Charges for recurring cost for composting (Inputs) - first year	1	Nos	1027	1027	0	0	1027
		Provision of Name board	1	Nos	500	0	0	500	500
		TOTAL				20717	0	8100	28817

*Need to get three years estimate; APD, Watershed informed that Rs.62,000 per acre provision is there under IWMP. Same unit cost has taken for estimate

