

**PROJECT PROPOSAL
ON CULTIVATION OF LEMON GRASS
IN
DIST-KORAPUT, GAJAPATI, MAYURBHANJ AND BOUDH**



**UNDER
RASTRIYA KRISHI VIKASH YOJANA
2017-18**

**Submitted By;
DIRECTOR OF HORTICULTURE,
ODISHA, BHUBANESWAR**

Executive summary

Name of the project	-	Cultivation of lemon grass inKoraput, Gajapati, Mayurbhanj and Boudh
Proposed area	-	480 Ha.
Implementing Agency	-	Dy. Director of Horticulture; Koraput, Gajapati, Mayurbhanj and Asst. Director of Horticulture, Boudh
Project Cost	-	Rs. 373.00 Lakh (As per MIDH Norm)
Funding Agency	-	Rashtriya Krishi Vikas Yojana (RKVY)
RKVY Assistance	-	Rs. 373.00 Lakh (As per MIDH Norm)
Year of Implementation	-	2017-18

1. CONTEXT/BACKGROUND

Aromatic plants synthesis and preserves a variety of biochemical products, many of which are extractable and useful as chemical feed stocks or as a raw material for various perfumery, flavouring and pharmaceutical industries. Aromatic plants contains odoured volatile substances in form of essential oils which constitute the essence or active constituent of plants.

Lemongrass (*cymbopogonflexuosus*) grows well in both tropical and subtropical climates. However, ideal conditions for growing lemon grass are warm and humid climate with sufficient sunshine and evenly distributed over most part of the year. Lemon grass can also be grown in semi-arid regions receiving low to moderate rainfall. It can grow well over medium fertile soils and moderate irrigation. Well drained sandy loam is most suitable for the growth of the plant.

Koraput, Gajapati, Boudh and Mayurbhanj Districts are quite suitable for cultivation of lemongrass. In Koraput, major area is available in Bandhugam block alone. In Gajapati, an area of 48 Ha. of lemongrass plantation was taken up in three villages of one particular GP namely Munising of Gumma Block under MGNREGS programme during 2014-15. In Boudh, an area of 50 Ha has been selected in Boudh block where the mango plantation under MGNREGS has been taken up during the year 2017-18, in which lemon grass can be grown as an intercrop.

It requires very little care and maintenance .It can be grown as rain fed crop. It is a perennial crop. The life span of the grass is 8 years i.e. once planted it could go on yielding herb for 8 years giving scope for at least 3 to 4 cuttings per annum. It is also considered as non-browsing crop. As a result it would prevent soil erosion and can control landslides to certain extent.

Lemongrass is an herb and is well known and utilized for its distinct lemon flavor and citrusy aroma. It is a tall, perennial grass which is native to India and tropical regions of Asia. It is a coarse and tufted plant with linear leaves that grows in thick bunches, emerging from a strong base and standing for about 3 meters in height with a meter-wide stretch. In addition to its culinary usage, lemongrass offers a wide array of medicinal benefits and is in extensive demand due to its antibacterial, anti-fungal and antimicrobial properties.

A. Economic importance.

The essential oil is extracted from the leaves. The oil has a strong lemon like odour and the *citral* content is more than 70%. This citral in the oil is used as basic raw material for synthesis of B-ionones. Another ingredient oleoresin constitutes more than 17%. Citral itself used in perfumery for various grades of soaps, detergents, cosmetics, insect repellents, room fresheners, ayurvedic preparations and flavouring agents for soft drinks and tea. The Citral rich oil has germicidal, medicinal and flavoring properties. Hence, lemon grass will not only ensure substantial income to the farm family throughout the year, but also covers the open space in any plantation.

As the grass is easy to grow with less risk, less investment and assured marketing and income, it gradually spread over in Odisha particularly in Koraput, Gajapati, Boudh and Mayurbhanj.

B. Marketing potential

The cosmetic & perfumery industry located mainly in Mumbai, Bangalore and Chennai e.i. Hindustan Lever Ltd, Industrial perfumer, KV Aromatic etc are the major consumers of essential oils. Apart from domestic market, lemongrass oil has got great export potential also. At present Srilanka and Indonesia are the two major exporters of these oils.

In the context of availability of suitable land and to harness the market potential of lemongrass oil, it can be grown profitably for upliftment of poor tribals of Gajapati District. A buy back agreement was signed with the swaraj aromatics ltd, Hyderabad with the cultivators of Dasamantpur block area in Koraput district by the district administration during 2012-13 while promoting the cultivation under MGNREGA. Other societies like; Koraput District Aromatic Farmers association, Koraput and Basamati Farmers multipurpose Co –operative society Ltd, Balda, Nandapur has shown their interest in cultivation and marketing of lemon grass oil. Marketing by TDCC, OLM and Patanjali can also be explored.

2. PROBLEMS TO BE ADRESSED

- Extraction of lemongrass oil and its sale can be taken up as one of the best suitable livelihood programme for providing livelihood support to the poor tribals.
- Unutilized waste land of tribal can be best utilized as sustainable livelihood support by cultivation of lemongrass which is a rain fed crop requiring very less irrigation and with little maintenance.

Planting Materials

- Lemon Grass slips are used as planting material for plantation of lemongrass.
- As there is no Govt source of planting material, the planting materials will be collected from the farmers, who have already done plantations. The price will be approved by the Technical Committee.
- For each 1ha of lemongrass plantation, 50000nos. of slips would be required for planting at a spacing 45 cm x 45 cm.

3. AIMS AND OBJECTIVES:

- To increase the area under lemon grass cultivation.
- To make unproductive land to productive one.
- To introduce new and improved cultivars.
- To popularize non-traditional cash crop to improve socio – economic status of poor tribal farmers and assured income to the farmers in a long run.
- To make a lemon grass hub for the national and international market.
- To facilitate farmers and buyers interaction for better marketing

4. STRATEGY:

- Cultivation of lemongrass is proposed to be taken up under RKVY in which financial support would be given for new plantation in clusters of 12 Ha. as per MIDH norm in DBT mode.
- 10 such clusters in each district will be taken up.
- The cost of machineries and all other components of the processing unit including water source is assisted under RKVY as per MIDH norm. Assistance under Processing Unit will be provided to each cluster. However the assistance should be approved by Director before release .
- Marketing of the produce and capacity building is proposed to be done by the producer group with the support of OLM of the District.

Sl.No	Name of the District	Approximate area of each cluster	No. of Clusters	Total Area	No. of distillation unit
01	Koraput	12 ha	10 nos	120 ha	10 nos
02	Gajapati	12 ha	10 nos	120 ha	10 nos
03	Mayurbhanj	12 ha	10 nos	120 ha	10 nos
04	Boudh	12 ha	10 nos	120 ha	10 nos

A. Cultivation

- Lemongrass Oil is used in the perfumery and cosmetic industry and the Oil (Citral) is extracted by steam distillation process.
- Yields per ha is 50 Ton of grass per Annum in 4 cycles.
- Oil Extraction rate is 0.6% to 1% i.e. from 1ha of land we will get minimum 300 kg of Citral @ Rs. 1000/kg (Koraput market) = Rs. 3.00 Lakh.
- Once planted can be harvested up to 7 years.
- Number of plants per ha = 50,000 nos. (1.5ft x 1.5ft)
- Cost of Cultivation in 1stYear:Rs.2.70 Lakh and 2nd year onward Rs. 2.00 Lakh.
- A Distillation Unit of capacity 2MT/day can be run for 300 days in a year with 12 to 15 ha patch of Lemongrass.
- Lemongrass cultivated in Rayagada, Nuagada, Mohana&Gumma Block of Gajapati District. It is also cultivated in Mayurbhanj, Jeypore and Baipariguda of Koraput District.

B. Technical specification of processing unit

The extraction of lemongrass oil is done by a steam distillation process. Regional Research Laboratory, Jorhat had developed the technology for the same. The main raw material required is lemon grass, apart from fuel and water for the distillation process. The percentage of oil is as low as 0.6 %. Little overheating or improper condensing may result in very low output and would damage some of the delicate aromatic components.

The distillation process comprises of two units, the tilting type distillation still and the condenser. The distillation unit is connected to the condenser through a pipe at the top. The condenser is a wild copper tube, which is cooled by flowing water. The condenser is connected to the oil accumulators.

First distillation unit is filled with water up to the desired level over which the grid is placed. Lemon grass collected from the field are then filled in the still over the grid and the lid is closed. The lid must be airtight. The still is then heated with the heat source provided below the still. The type of heat source depends on the fuel availability. Oil and water vapour mixer flowing out of the still passes through the condenser. The mixture gets cooled in the condenser and condense. The mixture of water and oil is collected in the accumulator. The oil is then separated from water as per the specific gravity.

C. Plant capacity

The plant capacity is mainly dependent on the distillation still, which is available in 500 kg. to 1000 kg capacity per batch. The plant utilization is dependent on the availability of grass.

Capacity	500 kg of lemongrass per batch
No. of shifts per day	2 nos.(Each shift 8 hrs.)
No. of batches per day	4 nos.(Each batch 0.5 ton of grass)
Yield of oil	0.6 % (average)
No. of working/ distillation days per annum	300 days
Total grass processing	600 tons per annum (@ 2 tons per day)
Total oil yield	3600 kg per annum (12 kg per day)

D. Distillation

- A Distillation Units can digest 500 Kg of Lemongrass at a time and take 4 hours to get the final product. 2 Ton of Lemongrass can be processed per day in 2 shifts.
- The cost of Distillation Units (2MT) including housing, water source is around Rs. 12.97 Lakh
- For each Cluster of 12ha (tentative as per requirement), One Distillation Unit will be provided, which will be managed by the farmers group.

E. Infrastructure & Machinery (Assuming land for infrastructure and power available)

- Land for Processing Unit 1050 sq. Ft
- Power 5KW
- Grass storage shed 35' x 30'
- Distillation Shed
- Distillation Unit
 - i. Lid lifting gear
 - ii. Furnace, Accessories and Chimney
 - iii. Condenser
- Bore Well with Water pump (2KL. / 2000 Lt. per day)
- Water storage tank

F. Estimated cost of Distillation from 12ha. (In Annexure – II)

The Estimated for extraction of Lemon Grass Oil from 12ha is as follows;

Year 1	Rs. 51.736 Lakh
Year 2	Rs. 26.71 Lakh
Year 3	Rs. 26.71 Lakh
Year 4	Rs. 26.71 Lakh

5. Target beneficiaries:

The beneficiaries will be the farmers of the 4 districts Koraput, Gajapati, Mayurbhanj and Boudh

6. Management

The Deputy Director of Horticulture, Koraput, Gajapati, Mayurbhanj and Asst. Director of Boudhalong with their field Officers will implement the programme as per guidance of Director of Horticulture, Odisha.

7. Finance

10 clusters of 12 ha each (Approximately) = 120 ha in 4 districts Koraput, Gajapati, Mayurbhanj and Boudh.

Total 480 ha @ Rs. 16,000/ha as per MIDH guideline	= Rs. 76.80 Lakh
Subsidy on Distillation Unit @ 75% or 60% as applicable	= Rs. 292.88 Lakh
on total applicable cost of Rs. 6.5 Lakh for 60 groups	= Rs. 4.88 Lakh
Total:	= Rs. 369.68 Lakh
Contingencies (1%):	= Rs. 3.32 Lakh
G. Total:	= Rs. 373.00 Lakh

Total cost of Expenditure for cultivation of Lemon Grass is at **Annexure-I**

8. Time Frame

The project will be implemented during 2017-18

9. Cost Benefit Analysis (12 ha) (Rs. in Lakh)

	1 st year	2 nd year	3 rd year	4 th year	Total
1Ha.	2.083	1.5627	1.5627	1.5627	7.4181
For 12Ha.	24.996	18.74	18.74	18.74	81.216
Depreciation	1.87	1.87	1.87	1.87	7.48
Interest 7%	1.31	1.31	1.31	1.31	5.24
Operational cost	7.97	7.97	7.97	7.97	31.88
Total	36.146	29.89	29.89	29.89	125.816
Economics of the scheme (in 4 years cycle)					
Oil yield (0.6%)	3600 Kg.	3600 Kg.	3600 Kg.	3600 Kg.	14400Kg.
Gross income @ Rs. 1000/ kg	36.00	36.00	36.00	36.00	144.00
Total expenses	51.736	26.71	26.71	26.71	131.866
Net return	-15.736	9.29	9.29	9.29	

10. Risk Analysis (SWOT Analysis)

A. Strength

- Availability of well drained upland and wasteland suitable for growing Lemongrass profitably with least care and maintenance.
- Availability of manpower who can be given employment throughout the year.
- Highly potential scope for marketing of the produce.

B. Weakness

- As ground water table is very low, in case sinking of bore well is not successful, alternative arrangement such as River / Nala lift or excavation of pond is to be carried out for making the unit functional.

C. Opportunity

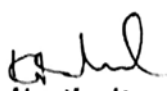
- There is good market potential and great demand for Lemongrass Oil (known as citral) which is widely used in cosmetic industry for making soaps, sprays , deodorants, polishes , medicines etc. The extracted oil is rich in citral A & P. Citral is the starter material for manufacture of VIT.A.

D. Threat

- There fluctuation in the market price of citral. As Lemongrass is to be planted in foothills there is apprehension of fire hazard. However it can be controlled by motivation of the farmers.

11. Outcome

1. The farmers can avail a sustainable livelihood support with least maintenance and care as the life span of Lemongrass is 7-8 years.
2. Poor tribals can get employment opportunity throughout the year with better income.
3. There would be best utilization of waste land marginal land. As Lemongrass is a soil binding plant it would check soil erosion and hence Land slide during rainy season can be controlled to some extent.


Asst. Horticulture Officer,
RKVY


Addl. Director of Horticulture,
Odisha

Annexure - I

original

**COST NORM FOR LEMON GRASS ORCHARD (NORMAL DENSITY)
UNDER MGNREGS 2015-16**

Area- 1Hact.

Density 62500 slips

Labour@ 174/day

Spacing- 50 cm x 30 cm

Sl. No.	Component of cost	1 st yr. New plantation		2 nd yr. Maint. of 14-15	
		Unit	Cost	Unit	Cost
A	Labour	MD	RS.	MD	RS.
1	Land development	50	8700		
2	Lay out & demarcation	5	870		
3	Ploughing & bed preparation	320	55680		
4	Application of compost & fertilizer	10	1740	10	1740
5	Planting followed by watering	60	10440		0
6	Irrigation	100	17400	120	20880
7	Intercultural operation (hoeing, weeding, application of fertilizer & manure)	75	13050	75	13050
		0			0
8	Application of P.P. Chemicals	10	1740	10	1740
9	Fencing	100	17400	50	8700
10	Harvesting & Post harvest handling	150	26100	450	78300
11	Watch & ward	60	10440	60	10440
12	Misc. for unforeseen labour work	15	2610	15	2610
	Sub-total 'A'	955	166170	790	137460
	INPUTS				
1	Planting material 62500 nos. slip @0.50	62500	31250		
2	Cost of manure (Qntl.)	20	24000		24000
3	Cost of organic fertilizer /Bio- fertilizer	5	14500		14500
4	Cost of organic P.P. Chemicals	L.s.	3000		3000
5	Incentive for Irrigation	L.s.	10000		10000
6	Cost of fencing materials	L.s.	16000		6000
7	Cost of material for watcher shed/working shed	L.s.	1000		500
8	Semi skilled person for supervision @ Rs.170/-	15	2550		2550
10	Construction of Display Board		1000		500
11	Misc. Expenses including transportation etc.		1030		990
	Sub-total 'B'		104330		62040
	G.Total of 'A'+ 'B'		270500		199500

Labour 61.43 %

Material cost 36.57 %

Approved
Collector & District Magistrate,
Gajapati, Parlakhemundi.

Deputy Director of Horticulture
Deputy Director of Horticulture,
Gajapati, Parlakhemundi.

Annexure - II

Year Wise Estimate of Expenditure								
Sl.No	Proposed interventions	Unit	Amount required (in lakh Rupees)					Remark
			1 st year	2 nd year	3 rd year	4 th year	Total	
1	Lemongrass cultivation in the farmers field	12H a	24.996	18.74	18.74	18.74	81.216	MGNREGS Norm
2	Storage Shed for grass 35'x 30 '		2.5				2.5	L/S
3	Distillation shed 25' x 16 ' x 15		1.2				1.2	L/S
4	Establishment of processing unit capital expenses. Distillation unit (Hydro steam & lifting system) 1MT / batch or 2MT / day made of 304 grade with accessories including cost of erection, commissioning and Trial.		12.97				12.97	Price quoted by OCCF limited Cuttack on 27.11.2015 and approved by Collector and District Magistrate,G ajapati
5	Water supply system 2000lit. Water tank at 14 'ht,		0.6				0.6	L/S
6	STW boring with 3HP pump set with pipes and other fittings & electrification.		1.5				1.5	L/S
SubTotal			43.766	18.74	18.74	18.74	99.986	
7	Operational cost							
	a)Wages for 6 persons @ of 3 persons per shift(8 hours per shift) @ Rs. 200 / day / for 300 days for running the unit		3.6	3.6	3.6	3.6	14.4	
	b) Other overhead expenditure		0.2	0.2	0.2	0.2	0.8	
	c) selling expenses		0.15	0.15	0.15	0.15	0.6	
	d) Interest cost @7% on capital expenses i.e. Rs.18.77 lakh.		1.31	1.31	1.31	1.31	5.24	
	e) Depreciation (10 % capital expenses)		1.87	1.87	1.87	1.87	7.48	
	f) Manpower for ovrall supervision of field and marketing @ Rs. 7000 / month		0.84	0.84	0.84	0.84	3.36	
Sub Total			7.97	7.97	7.97	7.97	31.88	
G. Total			51.736	26.71	26.71	26.71	131.866	