

**PROJECT PROPOSAL
ON AREA EXPANSION OF SWEET POTATO
IN
DIST- MAYURBHANJ, KEONJHAR, DEOGARH, BOUDH,
ANGUL AND BOLANGIR**



**UNDER
RASTRIYA KRISHI VIKASH YOJANA
2018-19 and 2019-20**

Project Cost: Rs. 253.30 Lakh

**Submitted By;
DIRECTOR OF HORTICULTURE, ODISHA, BHUBANESWAR
IN COLLABORATION WITH CTCRI, BHUBANESWAR**

PROJECT SUMMARY

Name of the Project : Area Expansion on Sweet Potato

Proposed Work :

Sl.No	Components	Unit	Total Cost in Lakh			Norms Adopted
			2018-19	2019-20	Total	
1	Nursery	ha	18	18	36	CTCRI
2	Demonstration	ha	48	48	96	MIDH
3	Training within District (Non-Residential)	Nos.	6	6	12	ATMA
4	Exposure Visit inside State	Nos.	7.2	7.2	14.4	ATMA
5	Provision of Processing Machinery (Small Scale)	Nos.	36	36	72	MIDH
6	Monitoring by CTCRI and Training of technicians	LS	4.2	4.2	8.4	LS
7	Contingency (1%)	LS	1.25	1.25	2.5	LS
	Total		120.65	120.65	241.3	

Districts : Mayurbhanj, Keonjhar, Deogarh, Boudh
Angul and Bolangir

Project Cost : **Rs. 241.30 Lakh**
2018-19: Rs.120.65 Lakh
2019-20: Rs. 120.65 Lakh

Source of fund : Rastriya Krishi Vikash Yojana

Year of Execution : 2018-19 and 2019-20

Implementing Agency : Directorate of Horticulture,
Odisha, Bhubaneswar

1. BACKGROUND AND CONTEXT

Odisha is located along the east coast of India and roughly 70% of the population lives in villages. The total area under Vegetable crops is 664087 ha and the production is 9036896 MT.

Odisha has a tropical monsoon climate, where annual rainfall varies from 1,140 to 1,716 mm, and increases from west to east. It has three main seasons: summer (March–June), rainy (July–October), and winter (September–February). Odisha is also one of the states most prone to and affected by climate change. About 70% of Odisha's soils in cultivated areas are acidic, and nutrient imbalances are major impediments to crop production. Remedial measures for soil nutrient replenishment or upgrade, as well as educating farmers on the right cropping pattern that suits the agro-climatic zones of Odisha, could help improve crop production in the state.

Root and tuber crops like cassava, sweet potato, yam bean, yams, etc can strengthen nutritional health at affordable prices. Tuber crops are popular mostly among the tribal populations of Odisha and are collected from the forest during the lean period. Odisha has the largest area under sweet potato cultivation with production of 381267 MT from **40410** hectares of land. The orange-fleshed sweet potato (OFSP) like; Bhu Sona and Bidhan Jyoti are exceptionally high nutritional value, and the crop can contribute significant gains in meeting nutritional demand and addressing food security for the tribal peoples with improved varieties and proper management practices.

➤ Sweet potato in Odisha

Sweet potato is an important crop planted and consumed in the eastern region of India, but the limited availability of beta-carotene-rich sweet potato (OFSP) is a major obstacle for its consumption in nutrient-deficient areas. Sweet potato is grown both in *Kharif* (wet southwest monsoon) and *Rabi* (dry post-monsoon) seasons in India,

There are early-maturing varieties of tubers that can be used in several ways that provide opportunities to boost both nutritional health and incomes:

- For human consumption as well as cattle feed
- High vitamin A content of OFSP
- Starch from the tubers
- Preparation of noodles, chips, jams, and salads
- Flour for baked foods
- Vines as a cheap source of fodder
- Tender leaves for culinary purposes.

2. Problems to be addressed

The climatic and soil condition in most parts of Odisha is congenial for dry-land crops like cassava, sweet potato, yam bean and yam. However, their potential has never been fully realized. This is primarily due to limitations in farmers' field situations, especially the lack of formal seed systems and land-holding size of resource-poor farmers that need to be corrected. The Major Constraints are;

- A. Use of poor-quality planting material.** This is the major limiting factor for increased sweet potato production in these areas. A low yield of sweet potato is without a doubt due to the use of poor quality planting materials. The major cause for this poor quality is the prevalence of infectious diseases, especially those caused by viruses, which are transmitted and maintained in the vine from one season to the next. Because of the vegetative nature of sweet potato reproduction, infectious diseases accumulate in the vine and are thus perpetuated over time, causing the crop to degenerate. Almost all viruses that attack sweet potato are spread through infected planting materials (vine cutting and storage roots). Because disease symptoms are usually invisible, infected planting materials are a ready source of infection. At present, the only way for farmers to avoid virus problems is by planting disease-free "seed."
- B. Poor agronomic practices.** In addition to the use of poor quality planting material, poor agronomic practices significantly reduce the yield of sweet potato. Its production could easily be more than doubled if improved varieties are grown, modern agronomic methods followed, and best multiplication practices used that can help ensure that vines are available all the year round.
- C. Traditional practices.** Most farmers in the region, especially small- and medium-size farmers, follow traditional methods of farming. They do not use all of the technologies currently available for successful sweet potato cropping. Improved technical knowledge is not as widespread as it should be.
- D. Limited use of improved variety.** Farmers grow a local cultivar, which has a long duration, poor yields, and lacks desirable characteristics for processing. Late harvest increases the risk of weevil infestation, which significantly influences low sweetpotato productivity in these areas. Better organized extension activities would help to disseminate better variety in farmers' fields.
- E. Weak extension service and poor linkage between research and extension (R&E).** Research institutions have generated good results that in most cases have not been used properly by the majority of farmers. This is primarily due to the poor linkage between R&E. The institutional capacity for using these linkage mechanisms is still very weak in these areas.
- F. Low level of education among farmers.** Limited education of farmers appears to be a basic problem in the technology transfer process. A more scientific approach to farmers, considering their problems and their limitations, is needed, such as through farmer field schools.

To popularize Sweet Potato in Odisha a project in the name of Generating Advances in Income and Nutrition through Sweet Potato (GAINS) was implemented from 2013-14 to 2016-17 through International Potato Centre (CIP), Bhubaneswar supported by Directorate of Horticulture under RKVY funding in four Districts namely Ganjam, Dhenkanal, Koraput and Sundargarh.

Activities taken up in GAINS project

- Plant Production at Research Station
 - Vines are produced in the primary nurseries at CHES and Departmental farms at Dhenkanal and Sundargarh.
- Each year 5ha has been taken up for production of vines in primary nurseries .
- Plant / Vine Production at Farmers Field
 - The vines produced from the primary nurseries are supplied to the farmers for multiplication of vines.

Sl. No	Year	Districts (ha)				Total hectares
		Ganjam	Koraput	Dhenkanal	Sundargarh	Phy.
		Phy	Phy.	Phy.	Phy.	
1	2013-2014	4	2.5	2	2	10.5
2	2014-2015	8	5	5	5	23
3	2015-2016	12	10	12	10	44
4	2016-2017	15	12.5	15	12.5	55
	Total	39	30	34	29.5	132.5

Sweet Potato Demonstration

Farmers are provided with subsidy for Sweet potato cultivation. The achievement year wise in the four districts is as follows;

Sl. No	Year	Districts (ha)				Total hectares
		Ganjam	Koraput	Dhenkanal	Sundargarh	Phy.
		Phy	Phy.	Phy.	Phy.	
1	2013-2014	40	25	20	20	105
2	2014-2015	80	50	50	50	230
3	2015-2016	120	100	120	100	440
4	2016-2017	150	125	150	125	550
	Total	390	300	340	295	1325

- Campaigning for Sweet Potato cultivation was promoted
- To improve the income, Intercropping with Legume was promoted.
- For Post-harvest processing and Marketing efforts are being taken.
- For Capacity building, training, workshop, Exposure Visit etc were conducted.
- Equipment and accessories are provided for better agronomic practices.

Outcomes of the GAINS project:

- **Two varieties**, namely Kanjangad and BidhanJyothi (OFSP) were widely popularized due to better growing and nutritious characteristics as compared to existing local or other introduced varieties.
- About **6000 beneficiaries** reached directly through GAINS project interventions and farmers who grow nutritious sweetpotato.
- **Multiplication of varieties** organized in a systematic and sustainable way which, provided sufficient key planting material to farmer's field nurseries for demonstrations.
- **Orange fleshed sweetpotato** rich in vitamin A has been introduced on a large scale for the first time for better nutrition and income generation.
- The multiplied planting material was carefully distributed to the different target districts and achieved **an area of 1325 ha** after the 4-year project period.
- **Vigorous trainings** on innovative production practices have encouraged farmers to cultivate sweetpotato.

A new proposal is now submitted for area expansion and other allied activities in another **6 districts** like; **Mayurbhanj, Keonjhar, Deogarh, Boudh, Angul and Bolangir**.

3. Aims and Objectives

The proposed project has three main objectives;

- To enhance the area expansion of improved sweet potato varieties with desired nutrition, utilization, and agronomic practices.
- To develop seed system to achieve self-sufficiency in planting material production.
- To establish and strengthen sweet potato value chains through product commercialization and market-driven innovations.

4. Strategy;

- The 6 districts to be covered for area expansion are Mayurbhanj, Keonjhar, Deogarh, Boudh, Angul and Bolangir districts.
- 40ha will be covered each year from 2018-19 to 2019-20 totaling 480 ha. for area expansion.
- Subsidy will be provided to the farmers @ Rs. 20,000/ha. as per MIDH guideline for undertaking demonstration.

A. Nursery

- The vines will be produced in the departmental farms or at any suitable location.
- In each district, the nursery will be raised in 10Ac. In the nursery 3,35,000 cuttings will be planted @33,500cuttings/Ac(60cmx20cm). and after 4 months (April to July) planting materials will be produced 10 times i.e. 33, 50,000. This can accommodate planting materials required for 40ha. /100Ac. demonstration. This will repeated in 2nd year for other beneficiaries. The planting materials for nursery will be supplied by CTCRI, Bhubaneswar and from other locally available sweet potato growers like; Dhenkanal, Koraput, Ganjam, Gajapati etc. The cost of planting materials for establishment of the nursery is Rs.20/100nos. **The additional cost of planting materials (from CTCRI source only) and transportation cost of vines for development of nursery (from CTCRI or any other source) may be met from the revenue generated by selling the planting materials produced in the nursery to the demonstration farmers@Rs.20/100nos.** The revenue, that can be generated by selling 33, 50,000 nos. of vines (for 100Ac Demonstration) is Rs. 33, 50,000 x 0.20 = Rs. 6, 70,000/-. The cost of cultivation of sweet potato (4 months) and the cost of production of vines (4 months) is same which Rs. 30,000/Ac. is **(Annexure – I, CTCRI source)**. The sale proceed of sweet potato harvested may also be added to the revenue receipt.
- Financial for raising planting materials.
6 districts x Rs.3, 00,000/- (10Ac @ Rs. 30,000/Ac.) = Rs. **18, 00, 000/-**

B. Demonstration

- A farmer can be given demonstration for maximum 1ha. each.
- The farmers will procure the vines @ Rs. 20/100 nos. from the departmental nurseries. Assistance will be provided as per MIDH guideline @ Rs. 20,000/ha. or Rs. 8000/Ac. in DBT mode
- Total Rs. 8,000/- x 100Ac.x 6 districts = **Rs. 48, 00,000**
- The assistance will be released to the farmers account on DBT mode after taking GPS photograph.
- Each year 40hact/100ac demonstration will be conducted.

C. Training within district (Non-Residential)

The farmers will be provided with 2 days awareness training two times on cultivation of Sweet Potato and preparation of homemade sweet potato products. 100 farmers will be provided with training (2 times) as per ATMA norms in each district

100 farmers x Rs. 500/- (2 days @ Rs. 250/day) x 2 time x 6 districts =
Rs. 6, 00,000/-

D. Exposure Visit Inside State

- Exposure visit inside the state will be conducted for the farmers.
- The farmers will be provided with 3 days exposure visit to Research Institutes and Farmers field inside the State. From each district 100 farmers will be covered each year.
- 100 farmers x Rs. 1200/- (3 days @ Rs. 400/day) x 1 time x 6 districts = **Rs. 7, 20,000/- as per ATMA norms**

E. Provision of Processing Machinery (Small Scale)

Farmers of each district will be provided with Processing Machineries like; Power Operated chipping machine, Blender, Drier, Hammer mill and packing machineries. Two Unit will be setup by the department in the suitable location of each district and will be handed over to the farmers as community facility as per MIDH norm.

Rs. 3, 00,000/- x 6 districts x 2 units = **Rs. 36, 00,000/-**



Pedal operated farmer-friendly cost effective Sweet potato Chipping machine

F. Monitoring by CTCRI, Bhubaneswar

Monitoring of project implementation will be performed by CTCRI. Local technicians/officials/farmers will also be trained for production and processing techniques by CTCRI. An amount of **Rs. 4, 20,000/year** is kept for monitoring and training by CTCRI.

5. Targeted Beneficiary

The beneficiaries will be selected among the interested farmers having a minimum land holding of 1Ac. and having irrigation facilities in sweet potato potential area. Tribal area will be preferred. Potential and suitable blocks of the project districts will be selected. Selection of blocks, villages, and farmers will be done by the departmental staff. The clusters will be selected based on;

- High incidence of poverty, malnutrition, and resource-limited agricultural environments
- Sweet potato is traditionally grown as a food crop and/or alternative staple to cereals in major sweet potato growing districts.



Details of the Project Areas to be covered in 6 Districts

Districts (sweet potato total area of ha)	Target Area(ha)		
	Y1	Y2	Total
Mayurbhanj	40	40	80
Keonjhar	40	40	80
Boudh	40	40	80
Deogarh	40	40	80
Angul	40	40	80
Bolangir	40	40	80
Total	240	240	480

6. Management

The project will be implemented by Directorate of Horticulture, Odisha with the field functionaries. Assistance of other line departments like; Agriculture and Watershed Development will be taken for selection of beneficiaries.

7. Finance

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7	Contingency (1%)	LS	1.25	1.25	2.5	LS
	Total		120.65	120.65	241.3	

N.B:- Inter componential changes can be allowed.

(Rupees Two Crore Forty One Lakh and Thirty Thousand) only.

8. Time Frame

Activity time schedule for the project

Sweet potato in Odisha can be grown in 2 cropping seasons

1. *Kharif* (August to November)
2. *Rabi* (December to March)

Sweet potato is generally grown in *Kharif* (75%) and to a lesser extent in *Rabi* (25%).

YEAR 1: 2018-19

A. Nursery:

Vine multiplication in the nursery will start from mid April to end of July (4 months). This activity will be taken up in departmental farms.

B. Demonstration:

Demonstration during Kharif will start from **August to November** and during Rabi from **December to March**. If required planting materials can be maintained by the Year – 1 Rabi Demonstration farmers up to April 2019 after harvest in March to supply the planting materials required for 2nd year nursery (2019-20).

YEAR 2: 2019-20

The above activity will be repeated.

9. Cost Benefit Analysis

Not Applicable, as it is not a infrastructure project.

10. Expected project Outputs, Outcomes and Impacts

Outputs

- Quality planting material to be used for seed in different sweet potato-growing areas of Odisha made available.
- Participatory approaches will be used to facilitate the development of varieties and implementation of advanced sweet potato technologies among farmers.
- Improved technical knowledge on improved practices for increased production and awareness of usefulness of OFSP and other sweet potato varieties.
- Improved marketing facilities and access to farming communities for easy sale and achieving better price through proper decision making on the market price at the local level.

Outcomes

- *Capacity strengthening:* Farmers, women, and youth trained on various aspects of sweet potato production and utilization. Depending on the average land-holding pattern of the local farmers, the area of cultivation/expansion could be assessed.
- *Access to improved varieties:* Planting materials of improved varieties are available, in desired quantity and quality, to at least 80% of sweet potato farmers.
- *Crop performance:* On-farm yield average of sweet potato and other crops increased 25%.
- *Food consumption:* Year-round sweet potato availability and consumption rate per capita increased 100%.

Expected Impact on Livelihoods and Poverty Alleviation

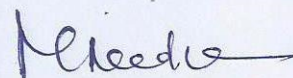
- Farmers start generating more income from their land through sweet potato production.
- A sound, self-sustaining seed production system is in operation.
- Farmers start consuming and marketing locally produced sweet potato.

4. Evaluation:

Monitoring of project implementation will be performed jointly by Directorate of Horticulture, Odisha and CTCRI. Local technicians will also be trained in monitoring and addressing production constraints and implementation issues.

Check list

- a. Funds available under other schemes of the State / Govt. of India for the proposed projects have been accessed and utilized before it is proposed under RKVY.
- b. There will be no duplication or overlapping of assistance / area coverage through other State / Central Govt. Schemes.
- c. The funds under the project are not proposed as additional or top-up subsidy to other ongoing schemes/programmes of State / Central Govt.
- d. DPRs includes contingency.



**Head, CTCRI,
Bhubaneswar**

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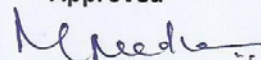
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Annexure - I					
Cost of cultivation of sweet potato / vine production (in 1 ha.)					
Density : 83750, Spacing : 60 cm x 20 cm					
Sl.No	Item of work	Unit	Qty.	Rate (in Rs)	Amount (in Rs.)
A. Labour					
1	Tractor Plothing / Pit / Trench making	Hr.	10	500	5000
2	Land preparation for cleaning field and bunds and through leveling	Mandays	23	213	4899
3	Application of compost as basal fertilizer	Mandays	5	213	1065
4	Seed material treatment	Mandays	2	213	426
5	Intercultural operation (hoeing, weeding, earthing up, ect.) and irrigation	Mandays	95	213	20235
6	Application of PP chemicals	Mandays	4	213	852
7	Harvesting & Post harvest handling	Mandays	37	213	7881
Sub Total - A					40358
B. Inputs					
1	Cost of seed materials	Nos.	83750	0.2	16750
2	Seed treating chemical	Litre	1	500	500
3	Manure / Compost	Tons	5	1200	6000
4	Biofertilizer (Azotobactor + PSB)	Kg	10	150	1500
5	Fertilizers				
	Nitrogen	Kg	50	40	2000
	Phosphorus	Kg	25	60	1500
	Potassium	Kg	50	60	3000
6	Micronutrients	Kg	10	100	1000
7	PP Chemicals	Litre/Kg	3	500	1500
8	Organic mulching materials	0	0	0	0
9	Stking materials / trellies	0	0	0	0
10	Irrigation charges	LS			152
Sub Total - B					33902
C. Misc.					
1	Misc / Conti. @ 1%				740
Sub Total - C					740
G. Total					75000

(Rupees Seventy Five Thousand) only

N.B: In case of planting materials supplied by CTCRI, the rate will be @ Rs. 50.00/100 nos. The additional amount will be met from the revenue generated.

Approved



Head, CTCRI

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Expected Impact on Livelihoods and Poverty Alleviation

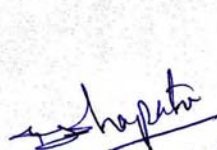
- Farmers start generating more income from their land through sweet potato production.
- A sound, self-sustaining seed production system is in operation.
- Farmers start consuming and marketing locally produced sweet potato.


4. Evaluation:

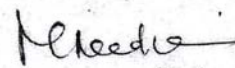
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- DPRs includes contingency.


D.A.H., Keonjhar


D.D.H., Bolangir


Head, CTCRI,
Bhubaneswar

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Fertilizers					
5	Nitrogen	Kg	50	40	2000
	Phosphorus	Kg	25	60	1500
	Potassium	Kg	50	60	3000
6	Micronutrients	Kg	10	100	1000
7	PP Chemicals	Litre/Kg	3	500	1500
8	Organic mulching materials	0	0	0	0
9	Stking materials / trellies	0	0	0	0
10	Irrigation charges	LS			152
Sub Total - B					33902
C. Misc.					
1	Misc / Conti. @ 1%				740
Sub Total - C					740
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(Rupees Seventy Five Thousand) only

N.B: In case of planting materials supplied by CTCRI, the rate will be @ Rs. 50.00/100 nos. The additional amount will be met from the revenue generated.

[Signature]
D.D.H., Keonjhar DDH, Bolangir

Approved
[Signature]
Head, CTCRI

Expected Impact on Livelihoods and Poverty Alleviation

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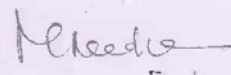
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Deputy Director of
Horticulture, Mayurbhanj
Baripada


Head, CTCRI,
Bhubaneswar

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[Signature]
25/10/18
Deputy Director of
Horticulture, Mysore
Baripada

Approved
[Signature]
Head, CTCRI

Expected Impact on Livelihoods and Poverty Alleviation

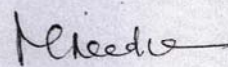
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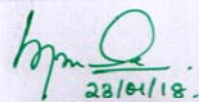
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- c. The funds under the project are not proposed as additional or top-up subsidy to other ongoing schemes/programmes of State / Central Govt.
- d. DPRs includes contingency.



**Head, CTCRI,
Bhubaneswar**



28/01/18.
Joint Director of Horticulture
DEOGARH

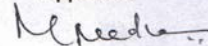
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Annexure - I					
Cost of cultivation of sweet potato / vine production (in 1 ha.)					
Density : 83750, Spacing : 60 cm x 20 cm					
Sl.No	Item of work	Unit	Qty.	Rate (in Rs)	Amount (in Rs.)
A. Labour					
1	Tractor Plothing / Pit / Trench making	Hr.	10	500	5000
2	Land preparation for cleaning field and bunds and through leveling	Mandays	23	213	4899
3	Application of compost as basal fertilizer	Mandays	5	213	1065
4	Seed material treatment	Mandays	2	213	426
5	Intercultural operation (hoeing, weeding, earthing up, ect.) and irrigation	Mandays	95	213	20235
6	Application of PP chemicals	Mandays	4	213	852
7	Harvesting & Post harvest handling	Mandays	37	213	7881
Sub Total - A					40358
B. Inputs					
1	Cost of seed materials	Nos.	83750	0.2	16750
2	Seed treating chemical	Litre	1	500	500
3	Manure / Compost	Tons	5	1200	6000
4	Biofertilizer (Azotobactor + PSB)	Kg	10	150	1500
Fertilizers					
5	Nitrogen	Kg	50	40	2000
	Phosphorus	Kg	25	60	1500
	Potassium	Kg	50	60	3000
6	Micronutrients	Kg	10	100	1000
7	PP Chemicals	Litre/Kg	3	500	1500
8	Organic mulching materials	0	0	0	0
9	Stking materials / trellies	0	0	0	0
10	Irrigation charges	LS			152
Sub Total - B					33902
C. Misc.					
1	Misc / Conti. @ 1%				740
Sub Total - C					740
G. Total					75000

(Rupees Seventy Five Thousand) only

N.B: In case of planting materials supplied by CTCRI, the rate will be @ Rs. 50.00/100 nos. The additional amount will be met from the revenue generated.

Approved



Head, CTCRI


 23/01/18
 Asst. Director of Horticulture
 DEOGARH

#

Expected Impact on Livelihoods and Poverty Alleviation

- Farmers start generating more income from their land through sweet potato production.
- A sound, self-sustaining seed production system is in operation.
- Farmers start consuming and marketing locally produced sweet potato.

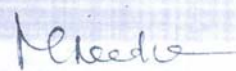
4. Evaluation:

Monitoring of project implementation will be performed jointly by Directorate of Horticulture, Odisha and CTCRI. Local technicians will also be trained in monitoring and addressing production constraints and implementation issues.

Check list

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23.1.18.
Deputy Director of
Horticulture
Angul


Head, CTCRI,
Bhubaneswar

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[Signature]
23.1.18
Deputy Director of
Horticulture
Angul

Approved
Head, CTCRI

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Asst. Director of
Horticulture, Boudh

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 Approved
 ADH, Boudh