

Implementation procedure for the component of Protected Cultivation (Erection of Shade Net House/ Greenhouse/Plastic Tunnels) in Odisha under MIDH/different schemes in Odisha

The green house technology is the technology for providing favourable growth conditions to plants inside fabricated structures with ultraviolet cladding material. In its simplest form, it is used to protect the plants from the adverse climatic conditions. Besides, in tropical climate where humidity is more, the natural ventilation is most helpful for the plant growth. Temperature is reduced due to provision of foggers, misting etc. In addition, Shade net houses can also be utilized for providing congenial atmosphere for growing plants under protected conditions.

The scheme is being implemented under MIDH and other schemes as well. The modalities for implementation of the programme are as follows:

Implementation Procedure :

1. Structures:

- 1.1.a Protected structures over area varying from 200m² to 2500m² will be constructed in farmer's fields on turnkey basis.
- 1.1.b Structures with Technical Specifications as specified in (Annexures: I – XI) will be erected by any erector empanelled in the State.
- 1.1.c The structures can be taken up under self finance scheme and under Bank Finance scheme.
- 1.1.d The list of such erectors will be communicated by the Directorate to the ADH/DDH from time to time. The same will also be hoisted in the website of the Directorate i.e. **www.odihort.in**. The beneficiary is free to choose the erector out of the empanelled list to erect the structure in his/her farm.
- 1.1.e The erector selected by the beneficiary will sign a Memorandum of Understanding (MoU) with the concerned beneficiary to provide warranty on the structure for a period of at least five years on structures & three years on covering materials (excepting for natural disaster/man made damage).

1.2 Cost of the Structure and Subsidy there of:

Sl. No.	Type of Structure	Size Range	Cost norm Rs./per m ²	50% subsidy (Rs./m ²)	20% subsidy (Rs./m ²)	Total subsidy limit @ 70% (Rs./m ²)
A	Greenhouse with Fan Pad System	Up to area 500 m ²	1650.00	825.00	187.00 (20% of Rs.935.00)	1012.00
		>500 m ² up to 1008 m ²	1465.00	732.50	187.00 (20% of Rs.935.00)	919.50
		>1008 m ² up to 2080 m ²	1420.00	710.00	187.00 (20% of Rs.935.00)	897.00

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		>2080 m ² up to 4000 m ²	1400.00	700.00	187.00 (20% of Rs.935.00)	887.00
B	Naturally Ventilated Poly house (NVPH), tubular structure	Up to area 500 m ²	1060.00	530.00	187.00 (20% of Rs.935.00)	717.00
		>500 m ² up to 1008 m ²	935.00	467.50	187.00	654.50
		>1008 m ² up to 2080 m ²	890.00	445.00	178.00	623.00
		>2080 m ² up to 4000 m ²	844.00	422.00	168.80	590.80
C	Naturally Ventilated Poly house (NVPH), bamboo structure	Each structure limited to 200 m ² , up to 4000 m ²	450.00	225.00	0.00	225.00
D	Shade Net House Tubular structure	With plastic top as addition. >4.00 m height	710.00	355.00	120.00 (20% of Rs.600.00)	475.00
E	Shade Net House Bamboo structure	Each structure limited to 200 m ²	360.00	180.00	0	180.00
F	Walk-In-Tunnel (WIT)	3.0 m and <4.25 m height	600.00	300.00	0.00	300.00
G	Plastic Tunnel	Limited to 1000 m ² per beneficiary	60.00	30.00	6.00 (20% of Rs.30.00)	36.00

1.3 Greenhouse:

1.3 a. Fan & Pad Structures: The maximum permissible cost per m² for calculation of subsidy will vary from Rs.1420/- to Rs.1650/- for Fan Pad type Greenhouse out of which 70% of the cost will be provided as subsidy. The beneficiary will contribute the balance cost as beneficiary's share. (For structures costing >935.00/m², subsidy will be 50% of unit cost from MIDH & 20% of 935.00/m² from NHM⁺). Maximum area per beneficiary is 2500 m².

1.3 b. Naturally Ventilated Structures: The maximum permissible cost per m² for calculation of subsidy will vary from Rs. 844/- to Rs.1060/- for Naturally Ventilated Greenhouses out of which 70% of the cost will be provided as subsidy. The beneficiary will contribute the balance cost as beneficiary's share. (For structures costing >935.00/m², subsidy will be 50% of unit cost from MIDH & 20% of 935.00/m² from NHM⁺). Maximum area per beneficiary is 2500 m².

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- 1.3.c. Greenhouse (bamboo structure) : The maximum permissible cost per m² for calculation of subsidy will be Rs.450.00 only out of which 50% of the cost will be provided as subsidy under MIDH. The beneficiary will contribute the balance cost as beneficiary's share. Size of each structure should not exceed 200 m².Maximum area per beneficiary is 4000 m².

1.4. Shadenet Structures

- 1.4.a Shadenet House (tubular structure): The maximum permissible cost per m² for calculation of subsidy will be Rs.710.00 only out of which 50% of the cost will be provided as subsidy under MIDH and 20% of Rs.600.00/ m² will be provided out of NHM⁺. The beneficiary will contribute the balance cost as beneficiary's share .Maximum area per beneficiary is 2500 m².
- 1.4.b. Shadenet House (bamboo structure): The maximum permissible cost per m² for calculation of subsidy will be Rs.360.00 only out of which 50% of the cost will be provided as subsidy under MIDH. The beneficiary will contribute the balance cost as beneficiary's share. Size of each structure should not exceed 200 m². Maximum area per beneficiary is 4000 m².
- 1.5.a Walk in Tunnels: The maximum permissible cost per m² for calculation of subsidy is Rs.600.00 and 50% of the cost will be provided as subsidy. Size of Unit is 800m² and assistance can be provided for maximum 8 Units per beneficiary.
- 1.5.b Plastic Tunnels: The maximum permissible cost per m² for calculation of subsidy will be Rs.60.00 only out of which 50% of the cost will be provided as subsidy under MIDH and 20% of Rs.30.00/ m² will be provided out of NHM⁺. The beneficiary will contribute the balance cost as beneficiary's share. Maximum area per beneficiary is 1000 m².

2. Eligibility for availing subsidy under the Scheme:

- 2.1 Minors are not eligible to avail subsidy.
- 2.2 Only farmer of Odisha can be a beneficiary under the schemes. The document viz. Ration Card/Voter Card/Aadhar Card/Domicile/Passport etc. is required to be submitted as a proof of residence.
- 2.3 Farmer means a person having land ownership in one's name. For this, he/she has to submit RoR. All the documents submitted shall be latest, not more than three months old.

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- 2.4 Farmer includes farmer's family, means husband, wife and their children. Ration Card/Electricity bill is required to prove family unit.
- 2.5 Department promotes clusters. Farmers of Odisha can take land on lease for erection of protected structures. The lease period of land should be minimum for 12 years.
- 2.6 The farmers in the following order of preference should be selected for implementation of the programme:
- i.) Young Unemployed persons who have completed 6 months training on Protected Cultivation from HTI, Kalinga /Sambalpur/CoE, Deras or School of Horticulture, Khurda.
 - ii.) Graduates in Agriculture or Allied Sciences including Horticulture / Agriculture Engineering.
 - iii.) Graduates in Science/Engineering.
 - iv.) Others
- 2.7 After selection by the District Mission Committee (DMC), in case the beneficiary is not trained on protected cultivation, he/she should be asked to take up the training at any of the training institutes (of one month duration) failing which the project would be de-sanctioned. An undertaking to this effect should be obtained from the farmer. In any case, subsidy will be disbursed only after completion of the training.
- 2.8 Farmers should be provided one time assistance only for erection of protected structures. An affidavit from the farmers to the effect that he/she has not availed subsidy for such structures anywhere in Odisha previously should be obtained.
- 2.9 The subsidy will also be available to Institutions/ Farmers' Groups/ SHGs/ Government Farms/ Private Firms/Limited Companies.

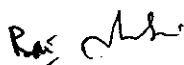
3. Procedure for submission of application & Sanction of subsidy:

- 3.1 The DDH/ADH in charge of the district will issue advertisement indicating the target on different components of protected cultivation for his/her district and will invite applications from eligible beneficiaries for erection of such structures.
- 3.2 Application forms will be available on-line in the website: <http://www.odihort.nic.in>. Interested farmers will have to download and take a printout of the application form from the website. (Annexure-A). Application forms will also be available in the office of the DDHs/ADHs. Applications should also be submitted on-line in the portal hortnet.gov.in.
- 3.3 The beneficiary should select an erector from the list of empanelled erectors provided by the ADH/DDH/or from the website www.odihort.nic.in. The erector will submit the drawing, design, material statement and quotation indicating component-wise price details for the structure. The design of the structures should confirm to the technical specifications as provided in Annexure- I to XI. The beneficiary shall also furnish a Project Report for the crops he/she is likely to take up in the protected structures. The



beneficiary shall submit the filled in application form along with relevant documents as per Annexure – H signed by him to the ADH/DDH.

- 3.4 All the applications will be received by the ADH/DDH within a specified date as decided by the District Mission Committee.
- 3.5 On receipt of the application form, the AHO of the concerned block will study the feasibility of the project and submit his report to the ADH/DDH within a specified time. For feasibility, the following criteria are to be taken in to account:
- The site selected for the structure is well drained.
 - There exists a source of irrigation with appropriate discharge to grow crops in the protected structures. The source can be borewell, farm pond, canal, river etc.
 - Availability of power
 - Good accessibility to the site
 - Area should be free from shade of big trees & buildings
 - If High Tension Electric line is passing through the site, there must be scope for providing vertical clearance of 3m (+ 0.3m for every additional 33 KV) and horizontal clearance of 2m for the structure(s).
- 3.6 The District Mission Committee will approve the feasible cases on first-come-first-serve basis. Record of applications received, projects sanctioned and details of the structures must be maintained at the O/o ADH/ DDH.
- 3.7 In case of projects financed by any bank, the beneficiary must mention the name of the bank from which he will avail loan.
- 3.8 The proposal along with DMC approval shall be forwarded by the ADH/DDH to the Directorate of Horticulture for sanction of subsidy. Projects costing more than Rs.5.00 lakh will be placed before the Executive Committee of MIDH for sanction. Projects costing less than Rs.5.00 lakh will be sanctioned by the Director of Horticulture.
- 3.9 In case of Bank Finance Projects, the ADH/DDH/ D H (O), as the case may be, shall forward a copy of the pre-sanction of subsidy order to the concerned bank for sanctioning the loan for the project as a credit linked project. Bank, after sanctioning the loan amount of project will send a copy of sanction letter and appraisal report to DDH/ADH.
- 3.10 On receipt of the sanction order, the beneficiary shall sign a Memorandum of Understanding (MoU) with the erector selected by him/her and submit the same to the ADH/DDH for issue of work order. On receipt of the same the ADH/DDH will issue the work order in favour of the erector selected by the beneficiary. In case of bank financed project, will furnish a copy of the work order to the concerned Bank.

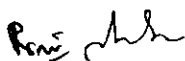


4. **Execution of the work :**

- 4.1 On receipt of the work order, the beneficiary will level his field. The responsibility of the beneficiary will be to arrange the pumping device of appropriate specifications, provide road connectivity to the site, and arrange for the power connection, preferably provision for un-interrupted power supply at the site. He will make a drain around the structure after completion of the structure. He will provide water and soil test reports for recommendation of fertilizer dose. He will also maintain a register at his field so that the observations/recommendations of the visiting departmental officers/representative of the erectors can be recorded.
- 4.2 Before taking up the work, the erector shall provide a photograph of the site with GPS coordinates (with a clearly demarcated Bench Mark) taken in presence of the concerned AHO/AE and the beneficiary.
- 4.3 The executant/erector will erect the structure as per the specifications **within the period as specified in the work order** on intimation to the DDH/ADH/AE concerned failing which the sanction order will be treated as cancelled.
- 4.4 The quality & quantity of materials should conform to the specifications provided.
- 4.5 The Assistant Agril. Engineer, O/O the ADH/DDH concerned will make periodic verification of the structure being erected and may suggest any modification if required.

5. **Completion of the Project:**

- 5.1 After completion of the Project, the erector will intimate the concerned ADH/DDH to take up necessary physical verification at the field. The erector will also report the completion with a photograph of the completed structure along with GPS coordinates of the project through email id: **supportdho.od@nic.in**
- 5.2 The erector should simultaneously guide the beneficiary for preparation of beds, laying of mulch, planting so that crop can be taken up immediately after completion. **Final payment should only be released after planting of crop in the protected structures.**
- 5.3 On completion of the erection, the erector will fix up a board of size 3'-0"X2'-0" in the structure clearly indicating the name of the beneficiary, amount of subsidy, date of completion, name of the erector etc.
- 5.4 The erector will furnish a warranty on the structure to the farmer on Rs.10/- stamp paper as per the format prescribed by Director of Horticulture, Odisha. **(Annexure-C)**
- 5.5 The Assistant Horticulture Officer shall upload the photograph of the project with GPS coordinates through the mobile app downloaded from the website: **hortnet.gov.in** and also furnish photographs to the ADH/DDH for record.

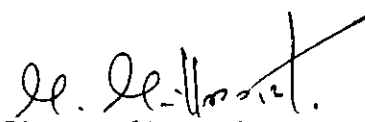


- 5.6 The beneficiary will submit the following documents to the Dy. Director of Horticulture/ Asst. Director of Horticulture: i) a copy of the warranty, his authorization (Annexure-E), an undertaking to the effect that he would not damage the project or sell the land in next ten years. **(Annexure-D)**
- 5.7 The ADH/DDH will form a committee comprising of the DDH/ADH, AAE, an officer nominated by Chairman DMC and AHO concerned who will verify the structure (Annexure-F). If the structure had been completed as per the specifications, the team will submit its completion report and recommend for release of subsidy **(Annexure-G)**.
- 5.8 The Asst. Agril. Engineer working in the districts should check measure the structures before final verification of the same by the team constituted in consultation with the Collector-cum-Chairman, District Mission Committee.
6. **Release of Subsidy:**
- 6.1 Subsidy will be released to the Bank Account of the beneficiary only. As per the decision taken by the Government of Odisha, the benefit/subsidy is to be transferred to the account of the beneficiaries directly through DBT.
- 6.2 For self financed projects, subsidy will be provided in one installment subject to completion of the construction in all respects and taking up plantation inside the structure and subject to the condition that the beneficiary produces a money receipt from the erector to the effect that he has paid the amount due to the erector.
- 6.3 In case of bankable projects, the following procedure may be followed:
- 6.3.1 The project should be sanctioned by the bank. The subsidy due will be placed in the loan account of the beneficiary on successful completion of the structure and after verification by the department as well as the bank. Bank may release the loan amount depending on progress of work in favour of the erector selected by the beneficiary for execution of the project (on the basis of the MoU signed between the erector and beneficiary) and also as per the verification by the department and the bank.
- 6.3.2 Subsidy for Protected structures can be released in two stages for bankable projects:
- a) 30% of the total subsidy amount due can be released (as per the decision taken in the EC of NHM in its meeting held on and communicated to the districts vide Directorate Letter No. 1/6443 dated 31.12.2013) after completion of foundation works subject to deposit of all required materials for the structure at the site, submission of the challan duly signed by the beneficiary and verification by the AAE of the concerned district.
- b) 70% of the total subsidy amount due after completion of the project in all respects and plantation work inside the structure is over. The subsidy will be released as per the recommendation of the Committee constituted by the ADH/DDH in consultation with the Chairman, DMC of the said district.

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7. Penalty Provision:

- i. The work assigned to any erector must be completed in time. In case of any exceptional circumstances like natural calamity, the period of work can be extended for a period of 30 days if applied citing appropriate reasons. However it will be up to the discretion of the Sanctioning Authority whether to allow extension of time or not.
 - ii. Penalty as per the MoU signed with the erector during empanelment can be imposed on the erector if he fails to complete the work within the stipulated time. However it will be up to the discretion of the Sanctioning Authority to consider the reasons for delay and the quantum of penalty to be imposed.
8. The cost of any additional items other than that mentioned in the technical specifications has to be borne by the beneficiary.
 9. Separate records for each of the projects will be maintained at the DDH/ADH level. A copy of the completion report of each project, photograph of the project and copy of the release order must be submitted to the Directorate of Horticulture for record.
 10. The DDH/ADH must submit the Utilization Certificate in the prescribed format to the Directorate after utilization of the fund placed with him.
 11. The farmers should be advised to take up training on protected cultivation at any of the Horticulture Training Institutes / Centre of Excellence, Deras / any recognized institution outside the State.
 12. The erectors should take steps to insure their structures.


Director of Horticulture
Rt. Secretary OHDS

ANNEXURE-I

Technical Specification for Naturally Ventilated Polyhouse (NVPH)

1. Total Height of NVPH - 6 m to 7 m (Normally 6.5 m)
2. Height of Gutter - 4 m to 4.5 m (Normally 4.5 m)
3. Height of Top Vent- 1 m (or 10% area of covered area whichever is higher)
4. Bay Size- 8 m x 4 m
5. Corridors - Maximum 2 m all sides for area calculation.

TUBULAR FRAME COMPONENTS			
Sr. No.	Part name	Specification	Description
1.	Main Column	76 mm OD & 2.9 mm thick (@ 5.24 kg/m)	6 m to 7 m length
2.	Small column along gable	76 mm OD & 2.9 mm thick (@ 5.24 kg/m)	4m to 5m length
3.	Small Column along gutter	76 mm OD & 2.9 mm thick (@ 5.24 kg/m)	4 m to 5 m length
4.	Foundation Stub	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	1.2 m to 1.4 m
5.	Corridor along gable	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	As per design
6.	Corridor along gutter	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	As per design
7.	Small bottom chord along gable	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	4 m
8.	Big Bottom chord	60 mm OD & 2.9 mm thick (@ 4.08kg/m)	8 m
9.	End Purlin	48 mm OD & 2.9 mm thick(@ 3.23 kg/m)	
10.	First top purlin	48 mm OD & 2.9 mm thick(@ 3.23 kg/m)	Top vent
11.	Second top purlin	48 mm OD & 2.9 mm thick(@ 3.23 kg/m)	Top vent
12.	4 m gutter purlin	43 mm OD & 2.6 mm thick (@ 2.54kg/m)	Support to gutter
13.	6 m gutter purlin	43 mm OD & 2.6 mm thick (@ 2.54kg/m)	Last pipe towards slope
14.	Curtain runner	43 mm OD & 2.6 mm thick (@ 2.54kg/m)	
15.	Horizontal member	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
16.	Long arc at end	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
17.	Long arc	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
18.	Small arc	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
19.	Knee Bracing and Small Inclined strut	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	
20.	Big Inclined strut	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	
21.	Top chord runner in last bay	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	At both ends
22.	Cross Bracing	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	At all top corners
23.	Curtain pipe	27 mm OD & 2.3 mm thick (@ 1.38 kg/m)	Max length 40 m
24.	Curtain pipe handle	27 mm OD & 2.3 mm thick (@ 1.38 kg/m)	
25.	Flap Control Pipe	27 mm OD & 2.3 mm thick (@ 1.38 kg/m)	
26.	Vent Stay	27 mm OD & 2.3 mm thick (@ 1.38 kg/m)	

Ans. 1

FIXTURES AND ACCESSORIES			
Sr. No.	Part name	Specification	Description
1.	Angle Bracket	ISA 40 X 40 X 3	
2.	Full angle Cleat	ISA 40 X 40 X 3	
3.	Half angle Cleat	ISA 40 X 40 X 3	
4.	Flat Patti 25/5mm	25 MM X 5 MM	
5.	Full Clamp	76 ID 40 mm Width & 2.9 mm thick	Galvanized/ Zinc plated
6.	Half Clamp	76 ID 40 mm Width & 2.9 mm thick	Galvanized/Zinc plated
7.	Full Clamp	60 ID 40 mm Width & 2.9 mm thick	Galvanized/Zinc plated
8.	Half Clamp	60 ID 40 mm Width & 2.9 mm thick	Galvanized/Zinc plated
9.	Full Clamp	43 ID 40 mm Width & 2.6 mm thick	Galvanized/Zinc plated
10.	Half Clamp	43 ID 40 mm Width & 2.6 mm thick	Galvanized/Zinc plated
11.	T-Fixtures	33 mm OD & 2.6 mm thick	Galvanized/Zinc plated
12.	L-Fixtures	33 mm OD & 2.6 mm thick	Galvanized/Zinc plated
13.	Curtain Clamp	42 mm Width	Galvanized/Zinc plated
14.	Universal Joint	20 mm sq. bar	
15.	Stud Cover	21 mm OD & 2.0 mm thick	Galvanized/Zinc plated
16.	Curtain Pipe Insert	21 mm OD & 2.0 mm thick	Galvanized/Zinc plated
17.	Self-Trapping Screw	20 mm length	Galvanized
18.	Bitumen Washer	3 mm thick	
19.	Spring Insert	2.3 mm dia.	
20.	Spring Insert (Platting)	2.3 mm dia.	
21.	M 10X125	10 mm dia.	Galvanized
22.	M 10 x125	10 mm dia.	Galvanized/Zinc plated
23.	M10X100	10 mm dia.	Galvanized/Zinc plated
24.	M 10 X 90	10 mm dia.	Galvanized/Zinc plated
25.	M 10 X 40	10 mm dia.	Galvanized/Zinc plated
26.	M 10 Nuts	10 mm dia.	Galvanized/Zinc plated
27.	M 10 washers	10 mm dia.	Galvanized/Zinc plated
28.	M 8 X 200	8 mm dia.	Galvanized/Zinc plated
29.	M 8 X 90	8 mm dia.	Galvanized/Zinc plated
30.	M 8 X 65	8 mm dia.	Galvanized/Zinc plated
31.	M 8 Nuts	8 mm dia.	Galvanized/Zinc plated
32.	M 8 washers	8 mm dia.	Galvanized/Zinc plated
33.	M 6 X 75	6 mm dia.	Galvanized/Zinc plated
34.	M 6 X 20	6 mm dia.	Galvanized/Zinc plated
35.	M 6 Nuts	6 mm dia.	Galvanized/Zinc plated
36.	M 6 washers	6 mm dia.	Galvanized/Zinc plated
37.	GI Wire 3 mm trellis wire	3 mm dia.	
38.	GI Wire 4 mm trellis supporting wire	4 mm dia.	
39.	Pulley with clamp HDPE/ MS	40 mm dia.	Galvanized
40.	Rings stainless steel	20 mm dia.	

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Entry Room (2 door of 1.2m x 2m Aluminium and poly carbonate mix)		
Sr. No.	Description	Specification
1.	Entry room size	4 m x 4 m, 4 m x 3 m, 3 m x 3 m
2.	No of doors	02 (inner door may be of frame stitched with 40 mesh insect net of minimum 50 cm (IS 16513:2016) overlapping
3.	Door size	1.2 m x 2 m; Door of wire gauge angle framed
4.	Frame of door (ISA four sides to cover the gap below the door)	Galvanized
5.	Half part of door (Downside)	Aluminium sheet
6.	Upper half part of door	Poly carbonate sheet 5 mm thick
7.	Flooring	50 mm PCC flooring over 75 mm thick sub base
8.	Foot wash basin	2 feet x 3 feet x 0.5 feet depth near outer door inside entry room

PROFILE AND GUTTER			
Sr. No	Part Name	Specification	Description
1	Profile	Aluminium profile OR GI Profile	200 to 220 g per running m 300 g per running m
2	Gutter, 1-1.5% slope, max. gutter length 40 m.	HDPE Plastic drainage sheet (Single piece)	UV stabilized 1.4 mm thick and 600 mm wide
		GP drainage sheet 1.2 mm supported by gutter purlins (Single piece, if supported on arch)	500 mm wide
		GP drainage sheet 2 mm (if supported on column)	500 mm wide
3	Zigzag spring insert	High carbon steel wire for repeated action, 2.3 mm dia	GI spring over 2 inch strip of new poly film over the main plastic in profile. (25% over lapping)

Cladding		
Sr. No.	Description	Specification
1.	•Plastic films for greenhouses- Specifications (IS 15827:2009)	Fixed properties - 200 micron thick

NETS		
Sr. No.	Part Name	Description
1.	40/50 mesh insect net to all four sides of curtains which shall depend on types of prevalence of insect pests	As per (IS 16513: 2016) 2.5-3 m width (height) (for vegetables & flowers) minimum 25 % of floor area
Or	40/50/75 per cent shade nets to all four sides of curtains which shall depend on types of prevalence of insect pests	As per (IS 16008; Part 1 & Part 2), 2.5-3 m width (height) (for flowers only) minimum 25 % of floor area
2.	35% shade net/30 mesh insect net	As per (IS 16008: 2016 part -1 & Part - 2)/IS 16513: 2016) to be fixed at top vent

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Indicative Bill of Quantity for Irrigation System

S.No.	Description of Item	Unit	Size sq.m		
A	Drip System		500	1000	2000
1	PVC Pipe 63 mm Class-II: 4 Kg/Cm ² (Main & Sub-main Line)	m	18	48	66
2	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
4	Lateral 16 mm Class-II: 2.5 Kg/Cm ²	m	60	75	110
5	Emitting Pipe 16 mm Class-2 (0.1m to 0.4m x 0.5 to 3 LPH)	m	1000	2016	4160
6	Pressure Regulating Valve 63 mm (2")	No.	1	1	1
7	Flush valve 63 mm	No.	0	1	1
8	Flush valve 40 mm	No.	2	1	1
B	Fogging System				
1	PVC Pipe 63 mm Class-II: 6 Kg/Cm ² (Main & Submain Line)	m	0	0	36
2	PVC Pipe 50 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	48	30
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
4	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
5	Lateral 16 mm Class-III: 4 Kg/Cm ²	m	240	440	840
6	4-Way Fogger Assembly with HP LPD	No.	70	140	280
7	Control Valve 63 mm	No.	0	0	1
8	Control Valve 50 mm	No.	1	1	0
9	Flush valve 63 mm	No.	1	1	1
10	Flush valve 40 mm	No.	1	1	1
C	Head Unit				
1	Disc Filter 25 m ³ /hr	No.	0	1	1
2	Disc Filter 10 m ³ /hr	No.	1	0	0
3	Sand Filter 25 m ³ /hr	No.	0	1	1
4	Sand Filter 10 m ³ /hr	No.	1	0	0
5	Manifold + Throttle Valve 2"	No.	1	1	1
6	Venturi Injector 3/4"	No.	1	1	1
7	Air Release Valve 1"	No.	1	1	1
8	Pressure Relief Valve 2"	No.	1	1	1
9	Non Return Valve 2"	No.	1	1	1
	Fitting & Accessories @ 5%	Set	5%	5%	5%
	GI Wire 2 mm thick (app price)	m	175	350	700
	Water Tank 1000 lit	Nos	1	1	1

Excluding taxes, transportation & installation

Rms

Annexure-II

TECHNICAL SPECIFICATION FOR POLY-HOUSE WITH FAN & PAD SYSTEM

1. Total Height of NVPH - 5.5 m to 6 m
2. Height of Gutter - 4 m to 4.5 m (Normally 4.5m)
3. Bay Size- 8 m x 4 m

TUBULAR FRAME COMPONENTS			
Sr. No.	Part name	Specification	Description
1.	Main Column	76 mm OD & 2.9 mm thick (@ 5.24 kg/m)	5m to 6m length
2.	Small column	76 mm OD & 2.9 mm thick (@ 5.24 kg/m)	4m to 5m length
3.	Foundation pipe	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	1.2 m to 1.4 m
4.	Short bottom chord along gable	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	4 m
5.	Long Bottom chord	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	8 m
6.	Horizontal member	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
7.	Long arc at end	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
8.	Gutter purlin	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	Support to gutter
9.	6 m gutter purlin	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	Last pipe towards slope
10.	Side purlin	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	
11.	Knee Bracing and Small Inclined strut	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	
12.	Big Inclined strut	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	
13.	Cross Bracing	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	At all top corners
14.	Curtain pipe	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	Max length 40 m
15.	Curtain pipe handle	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	
16.	Door and its Support	33 mm OD & 2.6 mm thick (@ 1.98 kg per	
17.	Gutter Purlin single piece	GP sheet 1.2 mm thick/ LDPE 1.42mm sheet 600 mm wide	supported with funnel and PVC pipes from
18.	Profile	200 - 220 gm Aluminium/ 300 gm GI per run	For fixing cladding
19.	Cellulose Pad	4" -6" thick, height 5'-6' with aluminium frame	
20.	Pump with accessories	1-3hp	For wetting of pads
21.	Co-axial fan (IS	1350 mm dia containing 6 GI sheet blades	4 no.
22.	Digital controller with sensory devices	For operationalising fan & pad system	2 no.
23.	Electrical connections	Standardised cable with ISI mark to be used	
24.	Plastic water tank & RWH mechanism	2000 litre plastic tank with fittings	1 no.

Prasanth

FIXTURES AND ACCESSORIES			
Sr. No.	Part name	Specification	Description
1	Angle Bracket	ISA 40 X 40 X 3	
2	Full angle Cleat	ISA 40 X 40 X 3	
3	Half angle Cleat	ISA 40 X 40 X 3	
4	Flat Patti 25/5mm	25 MM X 5 MM	
5	Full Clamp	76 ID 40 mm Width & 2.9 mm thick	Galvanized/ Zinc plated
6	Half Clamp	76 ID 40 mm Width & 2.9 mm thick	Galvanized/Zinc plated
7	Full Clamp	60 ID 40 mm Width & 2.9 mm thick	Galvanized/Zinc plated
8	Half Clamp	60 ID 40 mm Width & 2.9 mm thick	Galvanized/Zinc plated
9	Full Clamp	43 ID 40 mm Width & 2.6 mm thick	Galvanized/Zinc plated
10	Half Clamp	43 ID 40 mm Width & 2.6 mm thick	Galvanized/Zinc plated
11	T-Fixtures	33 mm OD & 2.6 mm thick	Galvanized/Zinc plated
12	L-Fixtures	33 mm OD & 2.6 mm thick	Galvanized/Zinc plated
13	Curtain Clamp	42 mm Width	Galvanized/Zinc plated
14	Universal Joint	20 mm sq. bar	
15	Stud Cover	21 mm OD & 2.0 mm thick	Galvanized/Zinc plated
16	Curtain Pipe Insert	21 mm OD & 2.0 mm thick	Galvanized/Zinc plated
17	Self-Trapping Screw	20 mm length	Galvanized
18	Bitumen Washer	3 mm thick	
19	Spring Insert	2.3 mm dia.	
20	Spring Insert (Platting)	2.3 mm dia.	
21	M10X125	10 mm dia.	Galvanized
22	M10 x125	10 mm dia.	Galvanized/Zinc plated
23	M10X100	10 mm dia.	Galvanized/Zinc plated
24	M 10 X 90	10 mm dia.	Galvanized/Zinc plated
25	M 10 X 40	10 mm dia.	Galvanized/Zinc plated
26	M 10 Nuts	10 mm dia.	Galvanized/Zinc plated
27	M 10 washers	10 mm dia.	Galvanized/Zinc plated
28	M 8 X 200	8 mm dia.	Galvanized/Zinc plated
29	M 8 X 90	8 mm dia.	Galvanized/Zinc plated
30	M 8 X 65	8 mm dia.	Galvanized/Zinc plated
31	M 8 Nuts	8 mm dia.	Galvanized/Zinc plated
32	M 8 washers	8 mm dia.	Galvanized/Zinc plated
33	M 6 X 75	6 mm dia.	Galvanized/Zinc plated
34	M 6 X 20	6 mm dia.	Galvanized/Zinc plated
35	M 6 Nuts	6 mm dia.	Galvanized/Zinc plated
36	M 6 washers	6 mm dia.	Galvanized/Zinc plated

Rev 1/2

Cladding		
Sr. No.	Description	Specification
1.	Plastic films for Green Houses- Specifications (IS 15827:2009)	Fixed properties - 200 micron thick

NETS		
Sr No	Part Name	Description
1.	40/50 mesh insect net on top vent having motorised mechanism.	As per (IS 16513: 2016)
Or	35/50/75 per cent shade nets to all four sides of curtains.	As per (IS 16008; Part 1 & Part 2)
2.	Foundations	Civil work for grouting up to 1 m depth of columns and hockey with cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)/ Grout & brick flooring with cement mortar 1:3 (1 cement : 3 fine sand) in centre for foot path of 1 m width having depth 15 cm for pathways.
3.	Irrigation facility	Drip Irrigation system with fogging/misting arrangements including head unit
4	Fabrication & Construction charges	

Per Mr

Indicative Bill of Quantity for Irrigation System

S.No.	Description of Item	Unit	Size sq.m		
A	Drip System		500	1000	2000
1	PVC Pipe 63 mm Class-II: 4 Kg/Cm ² (Main & Sub-main Line)	m	18	48	66
2	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
4	Lateral 16 mm Class-II: 2.5 Kg/Cm ²	m	60	75	110
5	Emitting Pipe 16 mm Class-2 (0.1m to 0.4m x 0.5 to 3 LPH)	m	1000	2016	4160
6	Pressure Regulating Valve 63 mm (2")	No.	1	1	1
7	Flush valve 63 mm	No.	0	1	1
8	Flush valve 40 mm	No.	2	1	1
B	Fogging System				
1	PVC Pipe 63 mm Class-II: 6 Kg/Cm ² (Main & Submain Line)	m	0	0	36
2	PVC Pipe 50 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	48	30
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
4	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
5	Lateral 16 mm Class-III: 4 Kg/Cm ²	m	240	440	840
6	4-Way Fogger Assembly with HP LPD	No.	70	140	280
7	Control Valve 63 mm	No.	0	0	1
8	Control Valve 50 mm	No.	1	1	0
9	Flush valve 63 mm	No.	1	1	1
10	Flush valve 40 mm	No.	1	1	1
C	Head Unit				
1	Disc Filter 25 m ³ /hr	No.	0	1	1
2	Disc Filter 10 m ³ /hr	No.	1	0	0
3	Sand Filter 25 m ³ /hr	No.	0	1	1
4	Sand Filter 10 m ³ /hr	No.	1	0	0
5	Manifold + Throttle Valve 2"	No.	1	1	1
6	Venturi Injector 3/4"	No.	1	1	1
7	Air Release Valve 1"	No.	1	1	1
8	Pressure Relief Valve 2"	No.	1	1	1
9	Non Return Valve 2"	No.	1	1	1
	Fitting & Accessories @ 5%	Set	5%	5%	5%
	GI Wire 2 mm thick (app price)	m	175	350	700
	Water Tank 1000 lit	Nos	1	1	1

Excluding taxes, transportation & installation.

Peri Anji

Annexure-III

TECHNICAL SPECIFICATIONS FOR BAMBOO POLY HOUSE

1. Width - As per design (preferably 3 5% of desired length of polyhouse)
2. Ridge height - 3.5 m to 4 m
3. Gutter height - 2.5 m to 3 m
4. Side vent & Ridge vent - 2 to 2.5 m & 1 m

FRAME COMPONENTS			
Sr. No.	Part name	Specification	Description
1.	Wooden/Bamboo posts	8 cm to 10 cm dia.)	IS 15912:2012
2.	Side posts & Gutter post/Tie beam	6 cm to 8cm	IS 15912:2012
3.	Fixture & fittings including preservatives		20% of bamboo cost
4.	Door	As per design	1 no.
Cladding Material			
Sr. No.	Description	Specification	
1.	•Plastic films for greenhouses- Specifications (IS 15827:2009)	Fixed properties - 200 micron thickness	
NETS			
Sr No	Part Name	Description	
1.	40/50 mesh insect net on side & top vent and Shade nets underneath plastic films.	As per (IS 16513:2016 & IS 16008:2016 part 1 & part 2)	
4.	Irrigation facility	Drip Irrigation system with fogging/misting arrangements including head unit	
5.	Fabrication & Construction charges		

Prof. Ashu

Annexure-IV

TECHNICAL SPECIFICATIONS FOR NET HOUSES – ARCHED ROOF

1. Round type top roof structure with 8 meter. X 4 meter grid
2. Corridors- Maximum 2 m all sides for area calculation
3. Total / ridge height of structure will be 5.0 meter.

FRAME COMPONENTS			
Sr. No.	Part name	Specification	Description
1.	Main Column	60 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	As per IS
2.	Foundation Pipe	48 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
3.	Top purlin	43 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
4.	Corridor	48 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
5.	Side Top Purlin	43 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
6.	Horizontal Member	43 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
7.	Long Arch	43 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
8.	Truss center support	43 mm OD & 2.9 mm thick (@ 4.08 Kg/m)	
9.	Cross Bracing	33 mm OD & 2.6 mm thick (@ 1.98 Kg/m)	
10.	Door & its support	33 mm OD & 2.6 mm thick (@ 1.98 Kg/m)	

NETS		
Sr. No	Part Name	Description
1.	40/50 mesh insect net on side & top	As per (IS 16513:2016)
2.	35/50/75 per cent shade nets to all four sides of	As per (IS 16008; Part 1 & Part 2)
3.	Foundations	Civil work for grouting up to 1 m depth of columns and hockey with cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)/ Grout & brick flooring with cement mortar 1:3 (1 cement : 3 fine sand) in centre for foot path of 1 m width having depth 15 cm for pathways.
4.	Irrigation facility	Drip Irrigation system with fogging/misting arrangements including head unit
5.	Fabrication & Construction charges	

Per, [Signature]

Indicative Bill of Quantity for Irrigation System

S.No.	Description of Item	Unit	Size sq.m		
A	Drip System		500	1000	2000
1	PVC Pipe 63 mm Class-II: 4 Kg/Cm ² (Main & Sub-main Line)	m	18	48	66
2	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
4	Lateral 16 mm Class-II: 2.5 Kg/Cm ²	m	60	75	110
5	Emitting Pipe 16 mm Class-2 (0.1m to 0.4m x 0.5 to 3	m	1000	2016	4160
6	Pressure Regulating Valve 63 mm (2")	No.	1	1	1
7	Flush valve 63 mm	No.	0	1	1
8	Flush valve 40 mm	No.	2	1	1
B	Fogging System				
1	PVC Pipe 63 mm Class-II: 6 Kg/Cm ² (Main & Submain Line)	m	0	0	36
2	PVC Pipe 50 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	48	30
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
4	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
5	Lateral 16 mm Class-III: 4 Kg/Cm ²	m	240	440	840
6	4-Way Fogger Assembly with HP LPD	No.	70	140	280
7	Control Valve 63 mm	No.	0	0	1
8	Control Valve 50 mm	No.	1	1	0
9	Flush valve 63 mm	No.	1	1	1
10	Flush valve 40 mm	No.	1	1	1
C	Head Unit				
1	Disc Filter 25 m ³ /hr	No.		1	1
2	Disc Filter 10 m ³ /hr	No.	1		
3	Sand Filter 25 m ³ /hr	No.		1	1
4	Sand Filter 10 m ³ /hr	No.	1	0	0
5	Manifold + Throttle Valve 2"	No.	1	1	1
6	Venturi Injector 3/4"	No.	1	1	1
7	Air Release Valve 1"	No.	1	1	1
8	Pressure Relief Valve 2"	No.	1	1	1
9	Non Return Valve 2"	No.	1	1	1
	Fitting & Accessories @ 5%	Set	5%	5%	5%
	GI Wire 2 mm thick (app price)	m	175	350	700
	Water Tank 1000 lit	Nos	1	1	1

Excluding taxes, transportation & installation

Ravi

TECHNICAL SPECIFICATIONS FOR NET HOUSES – FLAT ROOF

1. Round type top roof structure with 8 m X 4 m grid
2. Total galvanized and nut bolted structure
3. Corridors- Maximum 2 m all sides for area calculations

TUBULAR FRAME STRUCTURE			
Sr. No.	Part name	Specification	Description
1.	Main Column	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	As per IS 1161:2014
2.	Foundation Pipe	48 mm OD & 2.9 mm thick (@ 4.08 kg/m)	
3.	top purlin	43 mm OD & 2.9 mm thick (@ 4.08 kg/m)	
4.	Corridor	48 mm OD & 2.9 mm thick (@ 4.08 kg/m)	
5.	Horizontal Member	43 mm OD & 2.9 mm thick (@ 4.08 kg/m)	
6.	Long Arch	43 mm OD & 2.9 mm thick (@ 4.08 kg/m)	
7.	Truss center support	43 mm OD & 2.9 mm thick (@ 4.08 kg/m)	
8.	Cross Bracing	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	
9.	Door & its support	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	

NETS		
Sr No	Part Name	Description
1.	35/50/75 per cent shade nets to all four sides	As per (IS 16008; Part 1 & Part 2)
2.	Foundations	Civil work for grouting up to 1 m depth of columns and hockey with cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)/ Grout & brick flooring with cement mortar 1:3 (1 cement : 3 fine sand) in centre for foot path of 1 m width having depth 15 cm for pathways.
3.	Irrigation facility	Drip Irrigation system with fogging/misting arrangements including head unit
4.	Fabrication & Construction charges	

Ras

Indicative Bill of Quantity for Irrigation System

S.No.	Description of Item	Unit	Size sq.m		
A	Drip System		500	1000	2000
1	PVC Pipe 63 mm Class-II: 4 Kg/Cm ² (Main & Sub-main Line)	m	18	48	66
2	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
4	Lateral 16 mm Class-II: 2.5 Kg/Cm ²	m	60	75	110
5	Emitting Pipe 16 mm Class-2 (0.1m to 0.4m x 0.5 to 3	m	1000	2016	4160
6	Pressure Regulating Valve 63 mm (2")	No.	1	1	1
7	Flush valve 63 mm	No.	0	1	1
8	Flush valve 40 mm	No.	2	1	1
B	Fogging System				
1	PVC Pipe 63 mm Class-II: 6 Kg/Cm ² (Main & Submain Line)	m	0	0	36
2	PVC Pipe 50 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	48	30
3	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	18	0	0
4	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	30	42	60
5	Lateral 16 mm Class-III: 4 Kg/Cm ²	m	240	440	840
6	4-Way Fogger Assembly with HP LPD	No.	70	140	280
7	Control Valve 63 mm	No.	0	0	1
8	Control Valve 50 mm	No.	1	1	0
9	Flush valve 63 mm	No.	1	1	1
10	Flush valve 40 mm	No.	1	1	1
C	Head Unit				
1	Disc Filter 25 m ³ /hr	No.	0	1	1
2	Disc Filter 10 m ³ /hr	No.	1	0	0
3	Sand Filter 25 m ³ /hr	No.	0	1	1
4	Sand Filter 10 m ³ /hr	No.	1	0	0
5	Manifold + Throttle Valve 2"	No.	1	1	1
6	Venturi Injector 3/4"	No.	1	1	1
7	Air Release Valve 1"	No.	1	1	1
8	Pressure Relief Valve 2"	No.	1	1	1
9	Non Return Valve 2"	No.	1	1	1
	Fitting & Accessories @ 5%	Set	5%	5%	5%
	GI Wire 2 mm thick (app price)	m	175	350	700
	Water Tank 1000 lit	Nos	1	1	1

Excluding taxes, transportation & installation

Ram, chh

Annexure-VI

TECHNICAL SPECIFICATIONS FOR BAMBOO NET HOUSE

Sl No.	Item	Specifications/Descriptions
1	Size	100 m ² - 200 m ²
2	Width of Structure	At least 30% of the desired length of Shadenet House
3	Ridge Height	3.5 m – 4 m, Structure can also be flat type
4	Side Height	2.75 m – 3 m from floor area. 3 m in case of flat structures
5	Structure	Complete structures made of strong bamboo posts. The post should have diameter > 8 cm dia. for central post, side post & gutter post / tie beam etc & dia. > 6 cm for post plate, supporting post. Trusses / members / sticks / others structural members for joining each other properly. The bamboo post must be treated with preservatives protect it from termites / fungal attacks. There should be provision for opening one portion at either side for entry of small power tiller for intercultural practices.
6	Fasteners & Joints	All nuts & bolts, nails pegs, Aluminium profile (MS strip of high tensile strength & galvanized of desired width can be used, if required). There should be provision of coir & jute ropes for anchoring the structure.
7	Entrance Room & Door	Two entrance door of size 1.5m x 1.5m must be provided as per the requirements & covered with 200 micron UV stabilized transparent plastic film.
8	Cladding Materials	UV stabilized shading net conforming IS (IS 16008:2012) of desired % (to be decided based on crop & location) on the top & sides.
9	Fixing of Cladding Materials	All ends / joints of plastic film need be fixed with two way aluminium profile with suitable locking arrangements along with curtain top. Zigzag high carbon steel with spring action wire of 2 – 2.3 mm dia. must be inserted to fix shadenet into locking profile zigzag must be fully coated to minimize damage to the plastic film.
10	Insect Screen	40 mesh nylon insect proof nets (UV stabilized) of equivalent size need to be fixed at the sides up to a height of 2 m from ground level. Shadenet can also be used in place of insect net.
11	Irrigation System	Drip Irrigation System need to be selected on the basis of the crop spacing along with fogging & misting facilities. The suggested bill of materials should have provision of are sand filter, screen filter, control valve, by-pass assembly, air release valve, non return valve, throttle valve, flush valve, venture assembly with manifold, PVC/HDPE pipe PE plane lateral, emitting pipe, foggers & mister. Water tank of capacity 500 lts & fittings & accessories. The above is only indicative the actual design must be done as per crop & location.

For 

Annexure-VII

TECHNICAL SPECIFICATIONS FOR WALK-IN TUNNELS

1. Total height 4 m to 4.5 m (Normally 4 m)
2. Height of Top vent- 1 m (or 10% area of covered area whichever is more) & side vent 2.5m
3. Grid : 8m x 4 m

TUBULAR FRAME STRUCTURE			
Sr.	Part name	Specification	Description
1.	Main Column	76 mm OD & 2.9 mm thick (@ 5.24 kg/m)	As per IS: 1161
2.	Foundation Pipe	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	As per IS: 1161
3.	Long bottom	60 mm OD & 2.9 mm thick (@ 4.08 kg/m)	As per IS: 1161
4.	First top purlin	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	As per IS: 1161
5.	Second top purlin	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	As per IS: 1161
6.	Long Arch	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	As per IS: 1161
7.	Short Arch	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	As per IS: 1161
8.	Side purlin	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	As per IS: 1161
9.	Long & Short Cross bracing	43 mm OD & 2.6 mm thick (@ 2.54 kg/m)	As per IS: 1161
10.	Vent Stay	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	As per IS: 1161
11.	Cross bracing	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	As per IS: 1161
12.	Curtain pipe handle	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	As per IS: 1161
13.	Door and its support	33 mm OD & 2.6 mm thick (@ 1.98 kg/m)	As per IS: 1161

Cladding Material		
Sr. No.	Description	Specification
1.	Plastic films for greenhouses- Specifications (IS 15827:2009)	Fixed properties - 200 micron thick,

NETS		
Sr. No	Part Name	Description
1.	40/50 mesh insect net on top having motorised mechanism.	As per (IS 16513:2016)
2.	Foundations	Civil work for grouting up to 1 m depth of columns and hockey with cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)/ Grout & brick flooring with cement mortar 1:3 (1 cement : 3 fine sand) in centre for foot path of 1 m width having depth 15 cm for pathways.
3.	Irrigation facility	Drip Irrigation system with fogging/misting arrangements including head unit
4.	Fabrication & Construction charges	

Rms. mhi

Indicative Bill of Quantity for Irrigation System

S.No.	Description of Item	Unit	Size
A	Drip System		1000 m ²
1	PVC Pipe 63 mm Class-II: 4 Kg/Cm ² (Main & Sub-main Line)	m	48
2	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	42
3	Lateral 16 mm Class-II: 2.5 Kg/Cm ²	m	75
4	Emitting Pipe 16 mm Class-2 (0.1m to 0.4m x 0.5 to 3 LPH)	m	2016
5	Pressure Regulating Valve 63 mm (2")	No.	1
6	Flush valve 63 mm	No.	1
7	Flush valve 40 mm	No.	1
B	Fogging System		
1	PVC Pipe 50 mm Class-III: 6 Kg/Cm ² (Main & Submain Line)	m	48
2	PVC Pipe 40 mm Class-III: 6 Kg/Cm ² (Submain Flush Line)	m	42
3	Lateral 16 mm Class-III: 4 Kg/Cm ²	m	440
4	4-Way Fogger Assembly with HP LPD	No.	140
5	Control Valve 50 mm	No.	1
6	Flush valve 63 mm	No.	1
7	Flush valve 40 mm	No.	1
C	Head Unit		
1	Disc Filter 25 m ³ /hr	No.	1
2	Sand Filter 25 m ³ /hr	No.	1
3	Manifold + Throttle Valve 2"	No.	1
4	Venturi Injector 3/4"	No.	1
5	Air Release Valve 1"	No.	1
6	Pressure Relief Valve 2"	No.	1
7	Non Return Valve 2"	No.	1
	Fitting & Accessories @ 5%	Set	5%
	GI Wire 2 mm thick (app price)	m	350
	Water Tank 1000 lit	Nos	1

Excluding taxes, transportation & installation

Ram, ch

Annexure-VIII

TECHNICAL SPECIFICATIONS FOR LOW TUNNELS

Low tunnels are miniature structure producing greenhouse effect. These tunnels facilitate the entrapment of carbon- dioxide, thereby enhancing the photosynthetic activity of the plants, and hence the yield. These structures also protect the plants from high winds, rain and snow. Besides being inexpensive, they are easy to construct and dismantle. Low tunnels are used for producing high quality and high valued crops.

General Specification/Design:

- HDPE/PVC or PPR pipes of 15 mm to 20 mm may be used to form hoops
- Plastic rope for may be used for anchoring of the film and to avoid shrinks in the cladding film while in operation.
- Adequate provision for opening and closing of cladding film/material in case of polyethylene to be provided.
- Central Height of the hoop from the ground level to be 1.5 m

Material Specification:

1. UV stabilised Polyethylene plastic film of 25 micron or Polypropylene (Non-woven) fabric of 17 to 23 GSM may be used as cladding of tunnels.
2. For making hoops HDPE/PVC pipes of 3/4" to 1" may be used.
3. Length of the roll 625 m and width 1.6 m for both products
4. GI wire 6mm for anchoring of the hoops Terms &

Conditions:

- > CIPET testing reports not more than 6 months old conforming to applicable/relevant BIS to be submitted.
- > Warranty/Guarantee letter from the manufacturer for the supplied components to be submitted. "NO" dealer/trader authorization.
- > It is mandatory to have printing of logo, batch no, trade name etc. with thickness in microns is desirable on every meter of mulch.

NOTE: Selection of type of pipe may vary the cost of construction.

Ram. Singh

GENERAL TERMS & CONDITIONS:

- ❖ All the structures should be assembled at site without welding by using nuts, bolts, clamps and washers alone.
- ❖ The structures should be constructed in such a way that it could be fully dismantled and could be re-erected at different site without any loss to the structure.
- ❖ After completing the foundations, 10 days of curing is a must (better to cure 14 days).
- ❖ The foundations and joints should be telescopic type (better to have foundation with crimped end).
- ❖ The structure should be made of products/components as per applicable BIS. In case of non-BIS applicable reduction of unit cost will be levied subject to submission of desired documents and based upon the decision by the panel for selection at respective states.
- ❖ The structural members should be fixed with galvanized nuts & bolts and stainless steel self-drilling screws.
- ❖ Structure should be provided with 200 micron UV stabilized polyethylene film in case of polyhouses and if any special feature the same should be mentioned by submitting desired documents for a height of 60cm from the ground level. This sheet should be extended below the soil for a depth of 30-40 cm vertically and 20 cm horizontally.
- ❖ The polyhouse structure should be covered with UV stabilized polyethylene sheets having following combinations
 - a) Diffused + UV stabilized + anti dust + anti mist/anti drip, 200 micron thickness
 - b) IR cooler, diffused, anti-dust, anti-drip/fog, UV stabilized, 200 micron thickness
- ❖ Structure should be provided with minimum effective side ventilation not less than 30% of the floor area and roof ventilation should have a vertical height of 1 to 1.1 m and slanting height of 1.2 to 1.3 m.
- ❖ In case of supply of nets for mono x mono (IS: 16008:2016 Part 2) & tape x tape (IS: 16008:2016 Part 2) applicable license to be in the name of the supplier/fabricator.
- ❖ In case of supply of non-BIS products/components Technical Data Sheet and CIPET testing reports are mandatory which should be issued not more than 6 months from date of application.
- ❖ All sanction towards execution of the work should be made after pre & post inspection report submission.
- ❖ Joint Inspection Team (JIT) having members from SHM/IA, MoA, NCPAH, PFDC is of paramount.
- ❖ Criteria for Inspection -
 - First inspection to be conducted after the material reaches to the site of fabrication
 - Second inspection to be taken after the completion of the structure as per the design approved at the time of sanction of job/ work order. It is desirable that satisfactory certificate towards fabrication need be obtained during second inspection.
 - The inspection report to be signed by the beneficiary, supplier and in-charge JIT or authorised person of from SHM.
 - It is desirable that while conducting the inspection equipment's like Vernier Callipers, Screw Gauge, Micrometre & hand-held IR gun/thermometers to be carried by the selected team members for on-site verification of the installed components.

Ram, [Signature]

Annexure-X

LIST OF BIS STANDARDS FOR PLASTICULTURE APPLICATION

S.No	Application/Technology	Standard Title	BIS Nos.
1	Polyhouse/Greenhouse	Plastic Films for Greenhouses- Specifications	IS 15827:2009
2		Recommendations for Layout, Design and Construction of Greenhouse Structures	IS 14462 : 1997
3		Recommendations for Heating, Ventilating and cooling of Greenhouses	IS 14485 : 1998
4		Surface covered cultivation structures Establishment and operation of mist chambers	-IS 15175:2002
5	Nets	Agro Textiles - Shade Nets for Agriculture and Horticulture Purposes - Specification Part 1 Shade Nets Made from Tape Yarns (First Revision)	IS 16008:2016 Part 1
6		Agro Textiles - Shade Nets for Agriculture and Horticulture Purposes - Specification Part 2 Shade Nets Made from Mono Filament Yarns (First Revision)	IS 16008:2016 Part 1
7		Agro Textiles - Insect Nets for Agriculture and Horticulture Purposes - Specification	IS 16513:2016
8		Glossary of Terms Used in Agro-textile	IS 16366:2015
9		Plant protection nets	IS 10106:part 1: section 6:1992
10	Ground covers	Argo Textile - Woven Ground Covers for Horticulture Application - Specification	IS 16202: 2014
11	Mulching	Surface covered cultivation - Plastic mulching Code of practice Dec 2007	-IS 15177: 2002
12	Mulch laying machine	Surface covered cultivation- plastics mulch laying machine - functional requirement	IS 15830:2009
13	Sapling Bags	Jute Agro-Textile - Sapling Bags for Growth of Seedling/Sapling	IS 16089:2013
14	Vermi- beds	Agro Textiles - High Density Polyethylene (HDPE) Woven Beds for Vermiculture	IS 15907:2010
15	Plastic Ropes	Polyethylene ropes - specifications	IS 8674:1989
16	CAP covers, Cover top, tarpaulin	Specifications for Low Density polyethylene films (Second revision)	IS 2508 : 1993
17	Plastic Lining	Lining of canals with polyethylene film - code of practice (LDPE film)	IS 9698 : 1995
18		Textiles - Tarpaulins Made from High Density Polyethylene Woven Fabric - Specification (Third Revision)	IS 7903 : 2005
19		Multilayered Cross Laminated sheets and tarpaulin/covers - specifications	IS 14611: 1998
20		Textiles - Laminated high density polyethylene (HDPE) fabric for canal lining (First revision)	IS 15351:2003
21		Textiles - Laminated high density polyethylene (HDPE) fabric for water proof lining (First revision)	IS 15351:2008
22		PVC Geo-membranes for lining- Specification	IS 15909:2010

Ravi Ah.

Annexure-XI

LIST OF BIS STANDARDS FOR MICRO IRRIGATION COMPONENTS

SN	Standard Title	BIS
1	Polyethylene pipes for Irrigation- Laterals with amendment number 6	IS 12786: 1989 (reaffirmed 2009)
2	Irrigation Equipment-Emitters- Specification	IS 13487: 1992 (reaffirmed 2009)
3	Irrigation Equipment-Emitting pipes system- Specification (first revision)	IS 13488: 2008 (reaffirmed 2014)
4	Irrigation Equipment-Strainer type filters Specification (first revision)	IS 12785: 1994 (reaffirmed 2011)
5	Irrigation equipment rotating sprinkler Part I, Design and Operational requirements (1st revision)	IS 12232 (Part I) -1996 (reaffirmed 2011)
6	Irrigation equipment rotating sprinkler Part 2, Test method for uniformity of distribution (1st revision)	S 12232 (Part 2) -1995 (reaffirmed 2011)
7	Fertilizer and Chemicals Injection system Part I Venturi Injector	IS 14483 (Part 1) 1997 (reaffirmed 2009)
8	Irrigation Equipment-Media Filters- Specification	IS 14606: 1998 (reaffirmed 2009)
9	Irrigation Equipment-Hydro cyclone filter- Specification	IS 14743: 1999 (reaffirmed 2009)
10	Unplasticized PVC pipes for portable water supplies- Specification (third revision)	IS 4985 - 2000
11	Irrigation equipment -Sprinkler pipes - Specifications Part-I Polyethylene pipes (first revision)	IS 14151 (part I) 1999 (reaffirmed 2009)
12	Irrigation equipment- Sprinkler pipes - Specifications Part II Quick coupled Polyethylene pipes & fittings (second revision)	IS 14151 (part II) 2008 (reaffirmed 2014)
13	High Density Polyethylene Pipes for water supply- Specification (fourth revision)	IS 4984 : 1995 (reaffirmed 2002)
14	Fertilizer & Chemical Injector System- Part 3 Fertilizer Tank	IS14483 Part 3 - 2016
15	Irrigation Equipment- Design, Installation & Operation of Micro Irrigation Systems- Code of Practice	IS 10799: 1999 (reaffirmed 2009)
16	Prevention & Treatment of blockage problems in drip irrigation-Code of practice	IS 14791: 2000 (reaffirmed 2011)

Note: Standards are under revision/amendment after every 5 years w.r.t various parameters defined for a product, hence for latest parameters amendments/revision towards the above listed applications and applicable standards kindly refer to www.bis.org.in ■

P. S. S. S.

ODISHA HORTICULTURE DEVELOPMENT SOCIETY
MIDH/ OTHER SCHEMES

Annexure-A

APPLICATION FORM

Affix self attested
passport size
photograph

For Office use only	
Application No./HORTNET	Date of application:
Registration No.	Date of document checking:
	Date of entry:

To be filled by the Farmer/Beneficiary

1	General Information	
	Name of Scheme:	
	Applicant Type:	(Agency/Firm/Hindu Undivided Family/Individual/Partnership)
	Applicant Category:	(Big Farmer/Marginal Farmer/Small Farmer/Other Farmer)
2	General information of Farmer	
	Name:	
	S/o, D/o, W/o:	
	Category:	(Gen/W/OBC/SC/ST/Others)
	Age on the date of application:	
	Educational Qualification:	
	ADHAAR NO.	
3	ADDRESS:	House No.:
	Street No.:	Village:
	G.P.:	Block:
	Tehsil:	District:
	PIN:	Tel.No./Mobile No.:
4	Land detail of farmer (over which the proposed structure is to be erected)	
	Khata No.:	Plot No.:
	Mouza:	Tehsil:
	District:	Area(Ac.):
5	Type of Structure:	
	Area of the proposed structure:	
6	Training on Protected Cultivation	
7	Bank Details:	
	Name of the Bank:	
	Branch:	
	IFSC Code:	
	Account No. (Copy of the first page of Bank account to be furnished)	

Rm, sh

8	Whether availed subsidy benefit earlier under this component, if yes, details:	
9	Name of the firm selected by the beneficiary for execution of the Project:	
10	Crop proposed to be taken up by the beneficiary in the structure:	

DECLARATION

1. I/and my fellow farmers agree to get installed poly house/net house/tunnel from the firm, empanelled by the Directorate of Horticulture, Odisha and ready to pay whatever comes up as our share.
2. I/and my fellow farmers agree that I/we would care the structure at least for a period of 10 years and would never sell or replace this system during the period mentioned. In any violation of the above agreement, I shall be liable to pay subsidy amount back to Govt./agency.
3. I/and my fellow farmers agree that I/we have not availed any kind of assistance from any Govt. agency under this component.
4. I declare that whatever information I have given above is true and any misleading information from my side makes me liable to reject my case for sanction or I will pay the subsidy amount back to the Government/agency.

Date:

Yours faithfully

Signature of farmer

(Name)

Encl : Following documents with true copies:

1. Copy of land records
2. In case of leased land, copy of lease deed registered in the Office of the Sub-Registrar.
3. Copy of electricity bill/telephone bill as a proof of residence
4. Copy of Aadhaar Card:
5. Cost estimate of poly house/net house

Ranjit

Annexure-B

(FORM-2)
ODISHA HORTICULTURE DEVELOPMENT SOCIETY
MIDH/ OTHER SCHEMES
FEASIBILITY REPORT

FARMER DETAILS:

Name:	
S/o, D/o, W/o:	
Category:	(Gen/W/OBC/SC/ST/Others)
ADDRESS:	House No.:
Street No.:	Village:
G.P.:	Block:
Tehsil:	District:
PIN:	Tel.No./Mobile No.:
Land detail of farmer (over which the proposed structure is to be erected)	
Khata No.:	Plot No.:
Mouza:	Tehsil:
District:	Area(Ac.):

Land suitability for installation of structures (it should be based on following documents)

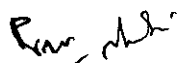
Sl. No.	Type of Record to Check	Check List (AHO to provide the details)
1.	Soil Test Report	Yes/No
2.	Water Test Report	Yes/No
3.	Site is not prone to water stagnation	Yes/No
4.	Water Table is not so high to affect foundation and subsequent cultivation	Yes/No
5.	Efficient Drainage (The site should not be land locked to restrict out flow of water from site)	Yes/No
6.	Isolation Distance (free from obstacles eg.	Yes/No
a)	Minimum distance of 6.5 mtr or equal to the height of boundary wall/other structure whichever is higher	Yes/No
b)	If High Tension Electric line is passing through the site, there must be scope for providing vertical clearance of 3m (+ 0.3m for every additional 33 KV) and horizontal clearance of 2m for the structure(s).	Yes/No
c)	Branches of tree should not touch the proposed structure	Yes/No
7.	Dimension of structure falls within area as per revenue record and sizra	Yes/No
8.	Source of irrigation available or not available.	Yes/No

Date :

(Signature of Reporting Officer)

Name

Designation.....



ANNEXURE –C

WARRANTY

(To be furnished by the Erector to beneficiary on
Rs.10/- Stamp paper)

I/Wedo here by declare that, I/We
will provide guarantee for a period of five years on structures & three years on covering material of
Shadenet House / Poly Green House of sizeerected by us in the field of
Sri/Smt/Miss.....S/o, /D./o , W/o
.....in village.....Post
Office.....G.P.....Block District.....
..... against any constructional defect action as per the Penalty Clause will be taken against on
firm/erector if we fail to provide the warranty.

Authorized Signatory

Witness :

Name,Address,TelNo.,Mob.No., E. Mail

1)

ANNEXURE-D

Beneficiary's undertaking

I, Sri.....S/o/D/o/W/oAt
.....G.P.....P.O....., Block.....
District.....do hereby undertake that I will maintain properly the Shade Net
House/Greenhouse erected in my field (Plot No....., Khata No.....Mouza)
under assistance from Director of Horticulture, Odisha under ----- during 2014-15. I
further undertake that I will not cause any damage to the structure deliberately or dispose of the
land on which the structure has been erected within next ten years. If so entire cost of subsidy will
be recovered from me.

Place:

Date:

Signature of Beneficiary

Ravi, Mohi

COMPLETION CERTIFICATE

ANNEXURE-E

Photograph
of farmer
with
structure
and board.

01. Name of the Beneficiary (Capital letter) :
02. Father's /Husband's Name :
03. Address At P.O :
G.P. Block
P.S District
Tel No. Mob. No.
- 05 Name of the Erector:
- 06 Date & Amount of deposit of beneficiary's share:
(Submit Xerox copy of Money receipt issued by the executants/erector)
- 07 Size of the Shade Net House
07. Materials used with specifications
(Attach BoQ & Invoice)
- 08 Date of receipt of completion report
from the Beneficiary/erector:

Rm Ash

Signature of the beneficiary

Annexure-F**Verification Report**

The erection of the Shade Net House/Greenhouse has been inspected on date _____. The structure has been completed in the above beneficiary's field as per the specification laid down by the Director of Horticulture, Odisha. The structure is fit for taking up horticultural activities. Subsidy for an amount of Rs. _____/- (Rupees _____) only @ _____-- of the unit cost may be released in favour of beneficiary.

ADH/DDH**AHO****AAE****Officer Nominated
By Chairman, DMC****Annexure-G****Subsidy release order:****Check List: The beneficiary has submitted the following documents:**

1. ROR/ relevant land records
2. Identity proofs
3. Copy of the Money Receipt in support of deposit of beneficiary' share
4. Quotation (Annexure-I)
5. Undertaking as in Annexure: D
6. Completion Report as in Annexure: E

The erector has submitted the following documents:

1. Warranty as in Annexure: C
2. BoQ
3. Invoice
4. Copy of MoU signed with beneficiary
5. Photograph of the structure taken in presence of the beneficiary and department officials

The erector has also placed the board indicating the details of the structure.

Subsidy of Rs. _____ (Rupees _____) only is hereby released in favour of Sri/Smt _____ on dt. _____ as per the recommendation of the team constituted vide Letter No. _____ Date _____ of ADH/DDH, _____ and Subsidy Sanction Order of the Director of Horticulture, Odisha vide Order No. _____ date _____.

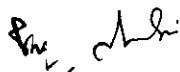
R. K. Chh

ADH/DDH

Sponsoring application:

Check List: The beneficiary has submitted the following documents:

1. Copy of ROR/ relevant land records along with revenue sketch of the plot.
2. Copy of Identity proofs.
3. Quotation with drawing & design.
4. Undertaking as in Annexure: D
5. Authorization as in Annexure: E
6. The sketch map of the site indicating plot no. & accessibility to site.
7. Availability of irrigation & power source
8. Training on Protected Cultivation



Annexure-I

(FORM-3)
ODISHA HORTICULTURE DEVELOPMENT SOCIETY
MIDH/ OTHER SCHEMES

(Quotation for Protected Structure Design, Specification & Estimate)
(To be submitted by farmer after taking it from firm)

Sl. No.	Particulars/Item	Details (all columns to be filled by firm and counter signed by farmer)
1.	Type of Structure (NVPH/Net House/WIT):	
2.	Size of structure:	
3.	Location of Structure (Khasra No. & Killa No.):	
4.	Type of Steel Material: (Tubular/Channel/Square/Rectangular)	
5.	Grid size/Span size (as per specifications):	
6.	Profile (Aluminium or GI):	
7.	Brand of Poly film as per properties specified in technical specifications:	
8.	Brand of insect net as per properties specified in technical specifications:	
9.	Brand of shade net as per properties specified in technical specifications (Mention percentage & colour)	
10.	Trellis wires (gear wire 2.0 mm/plain 3.0 mm)	
11.	Trellis support wire (gear wire 3.0 mm/plain 4.0 mm)	
12.	Micro Irrigation System (Name of company)	
13.	Others specifications	

(Signature of Proprietor of the Firm/its Representative)

Name of Representative:

Name of Firm

Accepted by

(Signature of the beneficiary)

Name of farmer

S/o

Village

Note : While submitting the quotation, the erector should note that the structure should meet out the minimum prescribed specifications and terms and conditions lay by the Directorate of Horticulture, Odisha.

