ICAR- Indian Institute of Horticultural Research(IIHR), Bangalore

Entrepreneurship and Leadership
Development Programme for Horticulture Entrepreneurs
Desirous of applying to Schemes of
National Horticulture Board

Crop / Activity	**Protected Cultivation of Vegetables**

2020

Become Entrepreneur	
	Lead Change and Innovation
Be creative	
	Lead Profits

ICAR- Indian Institute of Horticultural Research(IIHR)
Bangalore, Hesraghatta Lake Post – 560089
Karnataka

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Training Programme Name	**Entrepreneurship and Leadership Development Programme of Horticulture for Protected cultivation of Vegetables : Capsicum, Cherry Tomato, Bottle Brinjal, Cucumber, Zucchini, Musk melon, Lettuce and Broccoli**

Introduction: Vegetables growing is most preferred by these farmers due to quick and high returns and several vegetable crops are preferred in crop diversification. Vegetables are very important in human nutrition as they are rich sources of vitamins, minerals, food fibre and nutraceuticals. The area under vegetables gradually increased from 5593 thousand hectares in 1991-1992 to 6156 thousand hectares in 2001- 02 and the production also increased from 58532 thousand mt in 1991-92 to 88622 thousand mt in 2001-2002.According to the recent statics the area and the production of vegetables has shown a compound growth rate of 2.61% and 4.31 % respectively. Vegetable crops occupy about 10.11 million hectares and produce about 169.06 million tons during 2015-16 and the estimates stands at 220 million tons for the year 2020-21.The ICAR-IIHR, Bengaluru has been conducting research on majority of vegetable crops since 1968-69 and has developed a good number of sustainable varieties/hybrids and advanced production technology and many of them are being practices vegetable growers across the country. The salient features of commercial horticulture are perishability, intense technology, high profitability combined with high investment and high risks including vulnerability to post harvest losses. Overall it demands very good entrepreneurship and leadership.

National Horticulture Board, an autonomous organisation under the Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India has been promoting commercial horticulture in the country since 1984. To cope up with the challenges and prospects of commercial horticulture, to mitigate constraints & risks and maximise the benefits & net income, NHB has taken a number of initiatives viz., Model Detail Project Reports, conducting both awareness and technical workshops and simplification of scheme implementation process. One another important measure taken up is encouraging farmers, entrepreneurs and applicants desirous of availing benefit under its schemes to have requisite entrepreneurship and leadership ability by undergoing a 06 days training programme at one of the best training institutes recognised by it.

Rationale for the Training: NHB projects are credit linked and back ended and are capital intensive running from several lakhs to several crores. In addition these involve good documentation and time bound activities on the part of promoter, banker and other stakeholders. So endeavour should be to ensure that the project is successful by all means be addressing all possible risks. Over the years it has been observed by NHB that most of the promoters of NHB projects are not having the required understanding of scheme documentation, timebound activities and lack knowledge and skills of handling the project themselves and thus become subjected to vagaries of others ignorance and omissions and commissions. The result is a number of projects have failed or became ineligible for subsidy consideration. Thus so as to rule out any these omissions and commissions and risks, NHB has made it mandatory for every applicant to undergo a 06 days training programme at one of the NHB recognised /approved institution, with a goal of zero rejection of a project for which IPA is issued.

Importance of Project: Crop / Activity: Global/National/State and role in horticulture development

Name of Activity
Protected cultivation of vegetables - **Capsicum, Cherry Tomato, Bottle Brinjal, English Cucumber, Zucchini, Musk melon, Water melon, Lettuce and Broccoli**

Profile of the Institute:

ICAR- Indian Institute of Horticultural Research(IIHR), Bangalore:

The ICAR-Indian Institute of Horticultural Research (IIHR) is a premier institute conducting basic, strategic, anticipatory and applied research on various aspects of fruit, vegetable, ornamental, medicinal crops and mushrooms. The Institute was the first Horticultural Research Institute in the country established by the Indian Council of Agriculture Research on September 5, 1967 at the ICAR Headquarters, New Delhi. Subsequently, it was shifted to Bengaluru in Karnataka on February 1, 1968 at Hesaraghatta. The institute is spread over 263 ha of land, 25 km towards North from Bengaluru city. It is well connected by road, rail and airlines. The institute spread its sphere of research activities to the length and breadth of the nation by establishing its experimental stations at Lucknow, Nagpur, Ranchi, Godhra, Chettalli and Gonikopal. Over the years the experiment stations at Lucknow, Nagpur, Ranchi, and Godhra have grown in size and today they stand as independent institutes. As of now, the ICAR-IIHR has its Main Research Station at Hesaraghatta, Bengaluru and Horticultural Experimental Stations at Bhubaneshwar in Odisha and Chettalli in Kodagu and Hirehalli in Tumkur of Karnataka state with two Krishi Vigyan Kendras located at Gonikopal in Kodaguand Hirehalli in Tumkur districts. Apart from this, the institute houses Project Coordinating Unit of All India Coordinated Research Project on Tropical Fruits at its campus.

Infrastructure: The entire arable land of the institute is divided into well-defined nine blocks for carrying out research; and independent buildings for various divisions and departments to house laboratories were built. Currently the institute has well-defined divisions viz., Divisions of Fruit Crops, Vegetable Crops, Floriculture and Medicinal Crops, Post Harvest Technology, Plant Pathology, Entomology and Nematology, Soil Science and Agricultural Chemistry, Plant Physiology and Biochemistry, Plant Genetic Resources, Biotechnology and Social Sciences and Training, with more than 65 purpose oriented laboratories having state of art equipment's and facilities. The institute houses an ultra-modern library, conference halls, auditorium, training hostel, bank, post office, hospital, essential quarters and others. The institute also has established various service-oriented important units viz; Institute Technology

Management Unit (ITMU) and Business Planning and Development (BPD) units, Consultancy and Processing Cell, through which the technologies developed by the institute are being commercialized. Agricultural Technology Information Centre (ATIC) as a single window agency for dissemination of information and technologies developed by the institute and Agricultural Knowledge Management Unit, which implements and manages research information and e-governance. The AKMU has also created video conferencing facilities. The Website of the institute is also developed, hosted and managed by AKMU of the institute.

Mandate

- To undertake basic and applied research for developing strategies to enhance productivity and utilization of tropical and sub-tropical horticulture crops viz., fruits, vegetables, ornamentals, medicinal plants and mushrooms.
- To serve as a repository of scientific information relevant to horticulture.
- To act as a centre for training for up gradation of scientific manpower in modern technologies for horticulture production and
- To collaborate with national and international agencies in achieving the above objectives.

Mission: The mission of the institute is achieving sustainable development of horticulture, which in turn would provide livelihood security, economic growth and nutritional security that have been challenged from time and again by various factors. Towards this end, the IIHR, Bengaluru has been carrying out research in fruits, vegetables ornamental, medicinal plants and mushrooms.

Awards and Recognitions: Recognizing the achievements and contributions made by the Institute in the field of horticulture, the institute has been adjudged as Best Institute by Indian Council of Agricultural Research (ICAR), New Delhi and awarded Sardar Patel Best Institute Award twice; once in 1999 and again in 2010. ICAR- IIHR is recognized as the main center for production and supply of breeder seeds of vegetable crop varieties; the Institute nursery has been rated as Four Stars by National Horticulture Board; the pollen Cryo-Bank of the institute features in the Limca Book of Records 2001; has been recognized as the Team of Excellence in Biotechnology and Post-Harvest Management with a Product Development Laboratory to up scale the technologies, has got a center of DBT-ICAR National Facility for virus–diagnosis and quality control in tissue culture plants and Phyto-sanitary Certification Agency for seeds and planting materials; has been recognized as NABL accredited Pesticide Residue Research Laboratory in accordance with the standard ISO/IEC 17025:2005 for chemical testing of pesticides in fruits, vegetables, water, cereals and pulses and of late the Institute has established Horticultural Technology Management - Business Planning and Development Unit (HTM - BPD) to encourage and promote clientele based horti-business activities.

Research and Development: In the beginning years, the main research agenda of the institute was to increase the production and productivity of horticultural crop varieties by developing high yielding varieties in fruits, vegetables, ornamentals and medicinal and aromatic plants and mushrooms and also develop advanced production technologies to increase the productivity of horticultural crops. With changing times and emergence of new challenges in the fields of crop improvement, crop production, crop protection and crop utilization, emphasis was laid on breeding varieties for biotic and abiotic stresses, breeding F1 hybrids, developing integrated pest and disease management technologies, developing integrated water and nutrient management protocols towards optimum utilization of resources and production and utilization of edible and medicinal mushroom. Developing post harvest management practices to reduce post harvest losses and further value additions and frontier research areas like hi-tech horticulture especially production of vegetables under protected conditions, precision farming, information technology, biotechnological interventions to increase yields, protect crops from insect- pests, diseases and viruses, and extension of shelf life of crop produces, biological control, disease diagnostics, pesticide residue management, evaluation and mitigation of adverse effects of climate change in horticultural crop production *etc.* became the other priority areas with changing research agenda at the national level. Research work carried out during the last four decades has paid rich dividends in the terms of release of more than 200 varieties and hybrids and development of good number of sustainable production, protection and post-harvest management technologies.

The institute is involved in first line transfer of technology of dissemination of information and technologies developed by the institute. This is being carried out by conducting on-farm and off-farm demonstrations, various media and publicity activities, radio and television programs, publishing popular literature, video films, conducting field days, participating in national and international exhibitions, first line training programs for development functionaries, need based training programs to entrepreneurs and corporate/ private agencies and also to the needy farmers. Some of the innovative extension methods like mobile messaging, farmers' field schools, and techno-agents for promotion of sustainable horticultural activities, video conferencing for training, interactive meets etc. have been successfully employed. Popular literature in Kannada, Hindi and English languages in the form of extension bulletins and folders on various aspects of horticulture have been brought out and are being distributed to extension personnel and farmers. The institute offers consultancy services on various aspects of horticulture in the form of general consultancy on horticulture production, advisory service, project preparation and project appraisal, technology development etc. The other services like contract service, paid up trials, product testing and analysis, soil, water and leaf analysis and advisory, technology assessment and refinement *etc.* are also under taken on payment basis.

Capacity Building: The Division of Social Sciences and Training also conducts regular training programs to development personnel and farmers on various advanced technologies in horticultural sector. The division is looking after training and extension activities of the institute apart from research, conducting demonstrations, communication of technologies through innovative extension methodologies etc. The division had a Trainers Training Centre of the Indian Council and Agricultural Research (1976-1997) and an Advanced Training Centre of the Directorate of Extension Government of India (1997-2003). With the formation of National Horticultural Mission there is a lot of demand from the state department of various states as well as farmers and private entrepreneurs for acquiring training on various aspects of horticulture. Hence, tailor made training programmes are now being conducted on the various aspects of horticulture for the varied clientele on payment basis. It is the endeavour of the division to keep in tune with the technological requirements in horticulture and the latest developments in the field of information technology and accordingly various training programmes are being regularly conducted in the division.

Human Resources: Presently the institute has a total strength of more than 600 staff with more than 150 scientific, 225 technical, 80 administrative and 140 supporting staff. The institute is headed by the Director supported by Heads of Divisions, Chief Administrative Officer (CAO) and Chief Finance and Accounts Officer (CFAO). The Central Horticultural Experiment Stations at Chettalli and Bhubaneswar headed by the Station Heads and the Krishi Vigyan Kendras (KVKs) are headed by Program Coordinators under the overall control of the Director of the Institute.

Objectives of Training Programme :

1. Knowledge: Ensure every trainee acquires adequate knowledge and understanding of NHB Scheme Operational guidelines, Annual design and procedure viz.
    a. Eligibility of applicant including definition of family, and project, the process and steps involved in the scheme implementation, timelines, Scheme cost norms, pattern of assistance etc. Calculation of Eligible Project cost, Eligible components for subsidy, NHB standards, Basic Data Sheet & Protocols to be complied for availing subsidy,; Crop / Project specific Model DPR Template, Terms and conditions of IPA, Do's and Don'ts for Applicants /Banks/NHB officials for IPA ,
    b. List of documents(enclosed)

c. To acquaint with NHB website including registration and modes of online application, operation of online account and contact persons, helpdesk and grievance redressal.
d. Subsidy claim process through Bank/FI and list of documents to be submitted along with claim, JIT process, JIT Format, Documentation, Circumstances to request for and consider Re-JIT& Post-JIT process.
e. Formats of Agenda and check list used for processing subsidy claim.
f. How to expand understanding based on the minutes of meetings of previous IC and PAC available on website. It helps the applicant to understand how decision on subsidy is being made.
g. To know and appreciate specific Horticultural commodity / crop economic importance and potential of fresh commodity and processed / value addition commodity; Country and Global scenario and State/UT Scenario.
h. To learn / visit success stories / best practices including cluster development / FPOs; interact with successful entrepreneurs; and recognise key factors responsible for success and failure.

2. Personal leadership and skills development
    a. To explore leadership roles required in horticulture business and realign and recalibrate self with new knowledge, concepts and tools.
    b. Managing change and innovation and Taking charge and leading strategy.
    c. To learn/ improve IT/ social media and know how to benefit from Internet and newspapers/media.
    d. To improve leadership / social skills especially common informed vision, communication, team work, negotiation skills; with an exercise and success story.
3. Selection of cultivar, Technology to be adopted and Production practices for crop intensification and high productivity and ecological sustainability.
    a. How to select suitable variety/hybrid/cultivar and source quality planting material/ seed based on market demand and sustainability.
    b. Technology: Protection cultivation Technology-various kinds, customisation based on Agro-climatic condition, crop and pest and diseases profile; familiarisation of components and Mechanisation and Automation.

c. To know scientific production, harvesting and post-harvesting practices, technology and management and Analyse gap analysis with that of the current practices, technology and management of trainees.

4. Harvesting, Post-Harvest Management practices, technologies and Infrastructure
    a. Time of Harvesting, Moisture level of the produce, post-harvest practices, cleaning, sorting, grading, packing, labelling, pre-cooling, storage and transportation.
    b. To be aware of Post-harvest and storage practices, protocols and technologies.
    c. To know required infrastructure- Supply Chain/ Cold Chain and Marketing infrastructure and Gap analysis to the context of trainees.
5. Processing and value and value addition

6. Marketing and value chain development
    a. To know value chain and document current value chain of trainees context.
    b. To know how to source inputs from reliable and quality sources economically and explore best way / place to sell.
    c. To know market based production concept; crop planning and preparing crop calendar.
    d. Analyse market prices of various markets and causes of instability. Document market efficiency and share of grower in consumer price realisation and possible way to minimise price spread.
    e. To know importance of branding and promotion.
    f. How to become an Exporter and know the roles of APEDA.
7. Cold – chain development both for Export and Domestic Markets
8. Producing quality produce : MPS Registration will be taken in to account breeders rights
9. DPR for vegetables viz Capsicum, Cherry tomato, Lettuce, Broccoli an d their project management including finance and credit

    a. To empower selection of crop based project based on Agro-climatic/soil/ water suitability, Market, Finance and Technical viability.
    b. To empower the trainees to prepare Detail Project Report of his/her project. In case it is already prepared with the help of external

expert, the trainee is made to understand and critically analyse the same.

c. To know about Banks/ Financial Institutions; Loan procedure-how to avail finance/ credit- challenges and prospects. Document difficulties in trainees context and facilitate in possible solutions on expeditious and easy access to credit.
d. To know risks viz., including natural calamities in production and business and their management strategies including insurance schemes.
e. To learn about Farm record book keeping.

10. Cluster development / Collaborative farming: What is cluster? Essential elements? To know importance of cluster approach,
11. Government organisations and Schemes related to Horticulture and laws to be complied.
12. Horticulture Statistics sources including DAC&FW website and State Horticulture Dept. website.
13. Technology and Entrepreneurship

Pedagogy: Training methods / styles are:

a. Lectures- with two way communication using Audio-visual aids, videos etc.
b. Group discussion
c. Panel discussion
d. Skill practice
e. Interactive/exposure field visits etc.

Outputs expected: (As on the last date of 06 days training)

1. 100% attendance of all Classes prescribed.
2. Daily studying of reading material provided.
3. Successful and timely completion of assignments.
4. A score a minimum of 65 % in final assessment by each trainee.
5. Knowledge: by each of the trainee
    a. Essential elements of NHB Scheme guidelines, documentation & processes and Do's and Don'ts, understanding DPR, Bank Appraisal and Sanction, identification of risks and vulnerabilities and measures to address the same, Processes and documentation of NHB scheme implementation for successful subsidy release.

b. Essential elements of scientific and commercial Production, harvesting, post-harvest, Marketing, Exports etc. in English/Hindi/trainees' language.
c. Good Agricultural Practices, PBR, MPS registration. Traceability and standards etc.
d. Documentation of analysis of current scenario of trainees context-production, harvest, post-harvest, supply chain, marketing and gap analysis and possible road map.

6. Skills: by each of the trainee
    a. Curiosity and continuous learning.
    b. Crop: Modern scientific Cultivation, harvesting, post-harvest, food safety, traceability certification and standards.
    c. Project: PHM&CC: Modern scientific operations, technology, safety etc.
    d. Familiarisation of Technology, Standards, Protocols and hands on experience.
    e. Good understanding of DPR and Project Management:
    f. A 3 year Strategic action plan: A Year to Year strategy for 3 years to achieve set goal in 3 years- for improved production & productivity with economy, modern harvest, post-harvest practices, infrastructure, marketing and organisational systems for improved incomes.
    g. Problem solving- to solve existing problem being faced by the trainees.
7. Attitude: developing confidence and leadership to successfully complete NHB project timely as per NHB norms, specifications/standards, protocols etc.
8. Networking with various Government and Non-Government Agencies and mentors.
9. To know various schemes and future useful training programmes across the country.

Outcomes expected (in 18 months)

1. The proposed training completed Successfully with right technology and processes complying with all NHB Scheme requirements.
2. Cost of production reduced ; crop health improved, productivity increased & losses reduced.
3. Food safety Improved, certification / standards compliance

4. Quality infrastructure created .
5. profits/ net income increased.

Programme in Brief

<table>
<tr><td>Training Programme Name</td><td colspan="4">Entrepreneurship and Leadership Development Programme for Horticulture for Protected cultivation of Capsicum, Cherry Tomato, Bottle Brinjal, Cucumber, Zucchini, Musk melon, Lettuce and Broccoli</td></tr>
<tr><td>Duration</td><td colspan="4">06 working days</td></tr>
<tr><td>Participant Target Group</td><td colspan="4">Individuals desirous of availing NHB benefit under Scheme No.1 and also for those who want to improve their knowledge and leadership in protected vegetable cultivation .</td></tr>
<tr><td>Training Coordinator with Designation and Address Tel, Mobile and email id</td><td colspan="4">Dr.B.Balakrishna
Principal Scientist
Division of Social Science and Training
ICAR-IIHR, Bangalore – 560089
9448928197
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Dr.V.Sankar, Principal Scientist (Hort)
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Dr M.Senthil Kumar, Scientist
Division of Vegetable crops
ICAR-IIHR, Bangalore – 560089
Senthil.M @icar.gov.in
9481470531</td></tr>
<tr><td>Languages</td><td colspan="4">English/Hindi/Kannada</td></tr>
<tr><td rowspan="2">Training calendar for 2020</td><td>Month</td><td>Last date for Registration</td><td>Training reporting dates</td><td>Training Dates</td></tr>
<tr><td colspan="4">As decided by NHB</td></tr>
<tr><td>How to Apply</td><td colspan="4">Through email</td></tr>
<tr><td>Next review/ revision of Training Design</td><td colspan="4"></td></tr>
<tr><td rowspan="2">Batch size and cost and Payment system</td><td>Batch size</td><td>Course Fees</td><td>Hostel: Accommodation, Boarding: BF+L+D + Morning Tea + Afternoon Tea and Snacks</td><td>Total cost for 06 days</td></tr>
<tr><td>20 &</td><td colspan="3">Rs.1500 /participant/day .</td></tr>
</table>

<table>
<tr><td></td><td>above</td><td>Rs.9000 per person for 06 days</td></tr>
<tr><td></td><td colspan="2">Payment system and address:

Bank Account details:

<table>
<tr><td>1</td><td>Name of the Beneficiary</td><td>ICAR-Indian Institute of Horticultural Research, Bangalore</td></tr>
<tr><td>2</td><td>Bank Account Number</td><td>S.B. A/c No. 37578009241</td></tr>
<tr><td>3</td><td>Name of the Bank</td><td>STATE BANK OF INDIA</td></tr>
<tr><td>4</td><td>Name of the Branch</td><td>HESARAGHATTA</td></tr>
<tr><td>5</td><td>Name & Address of Bank Branch</td><td>SBI, IIHR, HESARAGHATTA LAKE POST, BANGALORE – 560 089</td></tr>
<tr><td>6</td><td>IFS Code</td><td>SBIN0041187</td></tr>
</table>

The Director

ICAR- Indian Institute of Horticultural Research

Hesaraghatta lake post, Bangalore

Phone -080-28466471, 080-28466353</td></tr>
<tr><td>Enrolment</td><td colspan="2">Is voluntary on the part of trainee and on his/her submission of willingness in writing to undergo training.</td></tr>
<tr><td>Certificate</td><td colspan="2">Upon successful completion of training with 65% marks in final assessment, the candidates are awarded completion certificate with marks.</td></tr>
<tr><td>NHB & IIHR Role</td><td colspan="2">1. The training programme is voluntary for any individual or trainee.
2. The cost of training is to be borne by trainee him/herself.
3. The training is not sponsored by NHB nor by any Government.
4. Upon 100% attendance and upon scoring 65% marks is considered as successful completion and then are eligible for training completion certificate.
5. Successful completion of training programme by the applicant and submission of completion certificate is one of the requirement for obtaining In-Principle Approval</td></tr>
</table>

	(IPA). 6. It is compulsory to reside in the hostel/accommodation provided by the institute in the interest of training. 7. The training institute has no say in NHB decision making either in approval or rejection of IPA or sanction or not sanction of Subsidy. 8. Trainees are responsible for their conduct and wellbeing issues 9. NHB has no liability towards IPA and Subsidy release or non-release 10. HTI has no liability towards IPA and Subsidy release or non-release.

Expectations from trainee before the arrival to the Training institute:

1. Study NHB scheme guidelines of all schemes with emphasis on specific component for which application is being/ is made including General conditions, Basic structure, Applicant eligibility, Technical standards, Basic Data sheet and Protocols, Budgetary allocation for his/her state/UT, Guidelines for submitting application, cost of application, various prescribed formats, FAQs, Dos and Don'ts, Agenda and Checklist, List of documents to be submitted both for Pre-IPA and IPA available in NHB website and as received in their online account.
2. Study one's own Detail Project Report along with Model DPR available in NHB website.
3. Visit NHB website and study various services available- especially Scheme guidelines, Model DPRs, Technical Standards, Statistics, NHB interactive, Minutes of meetings (past), Public circulars to the extent possible.
4. Should see him/her self whether he/she is satisfying NHB Scheme requirements.
5. To cooperate with Horticulture Training Institute.
6. To share specific problems/ gaps / barriers in horticulture growth and profits in his area.

Material to be brought by each of trainee:

1. Hardcopy of application already submitted to NHB if any.
2. Hardcopy of DPR already submitted to NHB or prepared if any.
3. Hardcopy of Model NHB DPR if possible.
4. Hardcopy of copy of Dos' and Don't's, Agenda and Checklist, List of documents to be submitted.
5. Hardcopy of applicants' eligibility and General conditions.

Day wise schedule

Session	Module	Learning	Expert
	Registration	**Registration** Prior-Assessment of knowledge, attitude and skills	
Day1 Session1	**Orientation / Inauguration**	• General discipline in class room (Do's and Don'ts) • Every trainee to share their introduction with expectations. • Motivational Talk	Course coordinator IIHR &Successful entrepreneur
Day1 S2	Economic / Marketing Potential and Specific State/ UTs context: Scope and opportunities and Success stories.	1. Poly house vegetable Crop Origin, Botany and production technologies of Capsicum, Cherry Tomato, Bottle Brinjal Cucumber, Musk melons, Lettuce & Broccoli 2. Area, Production, Productivity, Prices & value. In context with India & state 3. Global: Area, Production, Productivity, Prices Export and Import scenario 4. Domestic market : Supply and Demand 5. Case study of success stories-2 6. Concerns for growers / entrepreneurs!	IIHR Faculty & Successful entrepreneur
Day1 S3	Personal skills development	1. Lecture on soft skill development & leadership required in horticulture business	Guest Faculty
Day1 S4	NHB Scheme Guidelines, Annual Design and Processes of successful implementation and DPR, Bank Appraisal and Sanction of own Project	Group Discussion and Presentation by each group: 1.Scheme guidelines 2.Flow chart 3.Dos and Donts, List of documents to be submitted and Agenda and Checklist. 4.Technology standards/ Specifications etc. 5.Issues with Banks. 6.Common reasons for rejection of Projects at NHB. 7.Q& A on Queries.	DD NHB
	Quiz	Today's learning	
	Reading material for next day*	1. Study of NHB Scheme guidelines and come up with queries. 2. Reading material on Protected cultivation technologies, components	

		and erection. 3. Reading material on Agronomic practices.	
	Evening/Night Home work/ Assignment #	• Creation of Whats' app group of all trainees. • Joining of NHB crop specific/Project specific Whats' app group.	

*: To be read in the night before attending next day class.

#: Are evaluated/tested the following day.

Day2 S1 & S2	Media selection in protected cultivation Protected Cultivation Technologies	1. Cultivation Practices Capsicum, Cherry Tomato, Bottle Brinjal, Cucumber, Zucchini, Musk melon, Lettuce and Broccoli etc for soil, agro climatic requirements , media preparation , soil and soilless culture. Media sterilization ,Bed preparation. 2. Media for Nursery/seedling preparation 1.Types of greenhouses , Site selection, Layout & Design &Dimensions Structure Selection based on crop, location, climate, Foundation, Erection, Selection of cladding material, Quality norms of Greenhouse erection materials. 2.Familiarise different components & equipment of GH/ Shade net etc, Climate Control in greenhouse – RH, Temperature, light, as per crop requirement, 3.Operation & maintenance, automation in greenhouses 4.Cost and Economics of Protected cultivation, register keeping, Annual Maintenance Contract, insurance etc. 5.Selection of fabricator, Do's and Don'ts	**IIHR Faculty**
Day2 S3 & 4	Visit to Poly house / Shade net/ Tunnel/ etc. & Agronomic practices regarding	Familiarise technology and components of protected cultivation, practical on erection/ fabrication, challenges and suitability. Collective erection of Poly house / Shade net /Tunnel.	**IIHR Faculty**
		Agronomic practices:	
		• Soil & Water testing- PH & EC Concept, treatment and its importance. • Bed preparation and proper site/ field lay out / design	**IIHR Faculty**

	media preparation	• Fumigation & Mulching • Basal dose preparation • Plantation	
		• Soil less Media in Protected cultivation: • Coco peat , Rock wool, Perlite, Vermiculite • Media Bag Selection • Soil and Soil less cultivation &Importance in vegetable cultivation	**IIHR Faculty**
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on yesterday and today	
	Reading for next day	Crop Production technology under protected cultivation Capsicum, Cucumber, Cherry tomato..etc.	
	Assignment for next day	Study difference between different types of greenhouse structures and its material	

Day 3 **S.1 & S2**	Crop Production Technology- Class room	1. Crop production technology of Capsicum, Bottle brinjal & Cherry tomato (only two crop per day) 2. Planting – varietal selection, planting season, Spacing & important intercultural practices as per crops 3. Capsicum cultural practises – Nursery, planting, fertilizers and growth regulators application pruning. 4. Cherry tomato important cultural practises - Nursery management 5. Cherry tomato important cultural practises – Field preparation, planting, Micro irrigation and fertigation 6. Crop production technology of Broccoli and Lettuce 7. Planting – varietal selection, planting season, Spacing & important intercultural practices as per crops 8. Broccoli cultural practises – support structure, Media and bed preparation, important cultural practices and hygiene 9. Lettuce important cultural practises – support structure, Media for nursery cultivation, bed preparation , imp cultural practices and hygiene.	**IIHR Faculty**
S.3 & S4	Visit to Poly house / Shade net/ Tunnel/ etc.	Practical sessions including, planting, training and pruning, Raking of soil, removal of old leaves	**IIHR faculty**
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on 3 days	
	Reading for next day	• Cultivation of Cucumber, Zucchni , Musk melon, Lettuce	

		and other crops • Bed preparation and support system in Cucumber	
	Assignment	Importance of inter cultural practices like supporting in cucumber and Melons and removal of old leaves	

Day 4 S1 & S2	**Irrigation & Nutrient Management**	Irrigation and fertilizer management in Capsicum, Cherry Tomato, Bottle Brinjal, Cucumber, Zucchini, Musk melon, Lettuce and Broccoli 1. Water requirement, water quality for irrigation, treatment, critical stages of crop, irrigation schedule 2. Irrigation system (Drip / foggers/ misters),design specifications, maintenance 3. Care to be taken in procuring inputs 4. Fertigation-meaning, methods and equipments. 5. Nutrient Management (Macro & Micro) 6. Role of nutrients, deficiency and toxicity symptoms 7. Use of organic Manures in protected cultivation including Bio-fertilizer: Vermi compost production- Identify correct species of earthworm, quality production technique, finances and market linkage, food safety issues etc. 8. Care to be taken in procuring inputs	**IIHR , Faculty**
Day4 S3 & 4	Visit to Poly house / Shade net/ Tunnel/ etc.&	Measurement of water discharge from emitter, back flush of Sand filter/ disc filter/	**IIHR faculty**

	practical's regarding irrigation & fertigation in protected technology	Flush valve, pressure measurement at sand filter and in greenhouse lateral end	
		Practical on Fertigation equipment's, measurement of PH and EC of fertigation Solution and Drain water, preparation of A,B & C tanks, Fertigation in Soil and soilless culture	**IIHR faculty**
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on yesterday and today	
	Reading for next day	Crop protection in protected cultivation	
	Assignment for next day	Prepare the list of water soluble fertilizer supplier companies in India	
Day 5 S1	**Crop protection Pest management**	Crop protection in Capsicum, Cherry Tomato, Bottle Brinjal, Cucumber, Zucchini, Musk melon, Lettuce and Broccoli Introduction to major pests in protected cultivation 1. Identification knowing of pests symptoms, stages of attack , precautions and control measures-mechanical, cultural , Biological & chemical 2. Integrated Pest Management-Bio-pesticides, promotion of natural enemies. 3. Availing extension services at regular intervals with the visit of experts to fields.	**IIHR , Faculty**

Day5 S2	**Disease Management**	1. Introduction to major Disease in protected cultivation 2. Identification knowing of disease symptoms, stages of attack , precautions and control measures- mechanical, cultural , Biological & chemical 3. Integrated Pest Management- Bio-pesticides, promotion of natural enemies. 4. Availing extension services at regular intervals with the visit of experts to fields.	**IIHR Faculty**
S3	Harvesting, Post-Harvest Management / Infrastructure- to enhance shelf life and to reduce post-harvest losses	Post-Harvest Management Capsicum, Cherry Tomato, Bottle Brinjal, Cucumber, Zucchini, Musk melon, Lettuce and Broccoli Pre harvest care 1. Harvesting – time stage & method 2. Post harvest handling practices like precooling sorting grading bunching ,packaging, storage and transport 3. Quality standards for export and domestic market 4. Post harvest solution and value addition in vegetables 5. Packaging material and standards Proper technique & do's and don'ts of Harvesting;	
	Value Addition	1. Fresh product: Minimal processing. 2. Value Addition By product utilisation	

Day5 S4	Visit to Poly house / Shade net/ Tunnel/ etc. & practical's regarding pest and disease control protected technology	Identification of major pests, scouting, ETL level, spraying technique and safety measures	
		Identification of major disease , scouting, ETL level, spraying technique and safety measures	
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on today	
	Reading for next day	Post harvest technology in vegetables	
	Assignment for next day	Identification of pesticide supplier & equipment supplier	
	Visit to Protected structure- HTI	Skill /Hands on training on Harvesting techniques + Post-harvest practices	**IIHR Expert**
	Visit to Modern Pack house, cold storage etc.	Skill /Hands on training on Harvesting techniques + Post-harvest practices	
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on 7 days	
	Reading for next day		
	Assignment for next day	Difference between Applicants DPR and NHB's Model DPR- What are the learnings.	

Day 6 S1	Marketing and value chain development	Marketing Basics: 1. Value Chain Analysis of product / commodity in State / UT- Current scenario and the best possible solutions 2. Identification of markets- Export, Distant Market, Local markets- Mandis/ Traders, Processing units. 3. Demand – seasons / days etc. 4. Market Driven Production- Concept: What? How? Challenges? Solutions 5. Promotion strategy: Branding; Differentiation of product 6. e-marketing	**Marketing Expert, APMC Secretary, Exporter**
		Market Intelligence / Transparency in Market prices/ Assimilation of Market Information / 1. Knowing end market prices- Local market and distance market; from reliable sources, Mandis, competitors through Media-print, AIR, TV, internet, commission agents etc. 2. Analyse market information season wise. 3. Use market information to decide on crop (type vegetable), area to be grown, appropriate post -harvest decision to decide where to sell, when to sell, whom to sell, and what quantity to sell etc to be profitable. 4. Arranging cost effective transportation. • Also use market information for growing next crop, area and release of produce into market etc.	

		Demand assessment and management: 1. Need to consolidate demand from all sources- retail outlets, chain, hawkers etc. 2. Assured quantum can be vertically integrated with producers. 3. Variable demand is linked with indirect or Mandi based procurement. 4. To know a balance sheet: demand and supply of commodity if possible.	**KSAMB Marketing Expert**
		Causes of market instability and measures to address 1. Causes: Low cost supplies from new production areas, Fluctuating demand in Transport availability, Market manipulation, weather vagaries, local disruptions (Bandhs etc.) etc. 2. Measures: Building brand loyalty, Efficient supply chain with dedicated transport on pre-determined schedules, Complementary storage option for buffers for 2 weeks; For perishables- back end sources and reefer transport, modern pack houses; Food processing capacity, Export markets. Measures to check gluts.	**KSAMB APEDA Expert/ Marketing Expert**
		Marketing models / Measures to minimise price spread / enhance price realisation. 1.Direct- 1.Bulk sale- fast tracked without any pre-cooling with daily dispatches. 2.Bulk or retail outlets- owned/ franchisee. 3.Through wholesale	**KSAMB APEDA Expert/ Marketing Expert**

		trader / Retail chain/ Exporter/Importer/ Street vendors/ vegetable sellers. 2.Marketing with /without legal contract with buyers, supply chain agents etc. 3. Models: Direct Market Wholesellar Auction Market	
		Private partnership- Success stories	
		Potential niche Export markets 1. Global Scenario- product wise; Success story, 2. State/UT s potential, Challenges for Export markets- sea based; 3. Interaction with Exporters and Importers. 4. Linkage with Distribution hubs (Netherland)	**Exporter**
		Potential niche Export markets for vegetables 5. Global Scenario- product wise; Success story, 6. State/UT s potential, Challenges for Export markets- sea based; 7. Interaction with Exporters and Importers. 8. Linkage with Distribution hubs (Netherland)	**Exporter**
		Potential niche Domestic markets: for vegetables 1. Indian Scenario- product wise; Challenges for Domestic – road based	
		Exposure / Networking visits/Trade Fairs/ Exhibitions_ India & Abroad- CDB support	
	Interaction with successful entrepreneurs	Trainee specific Crop Production Technology in vegetables Post-Harvest Practices,	**Mentored by Successful entrepreneur**

		Technology and Infrastructure Producing Quality produce Finance, Credit & Farm/ Project & Risk Management	
S 2	Field visit	Visit to local APMC / Whole sale-Terminal market/ Retail Chain/ Recording of Price Information/	
	Discussion	Evaluation of Assignment and observations	
	Quiz	Learning on 5 days	
	Reading for next day	Agricultural credit -Term loan credit: Process and dos and donts	
	Assignment	Identification of Risks and Measures to overcome these risks for successful and timely completion of project as per NHB scheme guidelines, standards and making profits. **Explore:** **http://agmarknet.gov.in/** Documentation of difficulties being faced by trainees; Interaction with Bankers and growers	

Day S3	Government organisations and Schemes and applicable laws	List of Institutions for promotion of Horticulture: State/ UT Govt., DAC&FW- CDB, NHB, CPCRI, UT Government, Central Schemes – SFAC, NCDC, MoFPI, APEDA, NABARD etc. NHM	**State Dept. of NHB** **State/UT official Horticulture/** **SFAC** **APEDA** **NCDC** **NABARD**
S4	Technology Entrepreneurship & innovation	Technology areas & Providers • Quality Planting Material, Package of practices, IPM, Soil and Crop health, Aerial spraying, Crop monitoring, Pest and Disease Surveillance, Weather	**Expert**

		Forecasting • Advisory services • Use of IT, Automation- Drones etc. • Crop wise Experts across India and State. • Contacts at CDB/ CPCRI/NHB/ UT Agri.Dept./ KAU/ ATMA/NHM • Climate change Entrepreneurship: • What it is? Essential elements? • Entrepreneurship in Horti-business-salient features. • Steps involved in setting up an enterprise and laws to be complied. • Business avenues in trainees context. • How to minimise cost of production and maximise profits. Innovation • What is innovation? Innovation in Horti-business?	
	Knowledge and Statistics	• Maintain statistics- Growers, Area, Production, Productivity, Pest and Diseases, Age of plantation • What's app group; • ICAR/SAU/SHU News letters • Advisories • Online news • Market information- State/UT , Domestic and Export • Radio, • e-learning • Kisan Call centres	
S 5	Evaluation 1 Hour	Training evaluation /Test on 1. Knowledge 2. Skills 3. Attitude	**Course coordinator**

		Marks in the test are		
	Total Marks Final Assessment	1. Class room participation	25%	
		2. Timely submission of assignments	25%	
		3. Final evaluation	50%	
		Total Marks (Are recorded in Completion Certificate)		
	Feedback 30 Min			**Course coordinator**
	Discussion on Feedback			
S 6	Valediction			

Trainers' Material: to be used for preparing Participants Handbook first in English and then in local language as far as possible.

The following weblinks are illustrative. Training Institute is requested to explore more and the best fit material for the trainees socio-economic condition, crop and enterprise.

S NO	*Module*	*Reading material*
		For the trainer
	Economic Potential and Specific State/ UTs context and Success stories.	Horticulture Statistics at a glance: http://agricoop.gov.in/statistics/publication-reports World fruit and vegetable map: 2018: Robo Bank https://research.rabobank.com/far/en/sectors/regional-food-agri/world_fruit_map_2018.html APEDA AGRIEXCHANGE: http://agriexchange.apeda.gov.in/ ICAR institutions publications on specific crop CII / FICCI/ASSOCHAM/ PHDCC reports http://www.fao.org/docs/eims/upload/210971/global_issues_paper.pdf Success stories: http://agritech.tnau.ac.in/success_stories/sstories_horti_2015.html
	Economic Potential and	https://www.gscpequivalenceprocess.com/ GRASP: Global GAP Risk Assessment on Social Practice The Global Social Compliance Programme GSCP https://www.gscpequivalenceprocess.com/
	Finance, Credit & Farm/ Project & Risk Management	Model DPR Templates for NHB Schemes ww.nhb.gov.in

	Cluster development : Collaborative farming/ FPOs/ FPC	NHB Website: Proposed scheme: Horticulture Business Cluster and Supply chain development Programme FAO (2010) Agro-based clusters in developing countries: staying competitive in a globalized economy http://www.fao.org/docrep/012/i1560e/i1560e.pdf World Bank: Agriculture Clusters https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/Agricultural_Clusters.pdf How Can the Poor Benefit from the Growing Markets for High Value Agricultural Products? FAO / UN Paper https://papers.ssrn.com/sol3/papers.cfm?abstract_id=944027 Crop specific Producers Society and company online authentic sources
	Selection of cultivar and Production practices for high productivity	ICAR institutions publications on specific crop Package of practices of specific crop (s). e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions. ICAR e-courses: https://ecourses.icar.gov.in/
	Harvesting, Post-Harvest Management / Infrastructure	Analysis of FPO model for Vegetables https://nccd.gov.in/PDF/Analysis_FPO_model.pdf Doubling of Farmers Income Report: Vol.III and IV http://agricoop.gov.in/doubling-farmers
	Processing / Value Addition	ICAR / Any reputed R&D Institution publications e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions.
	Supply/ Cold-chain development	Cold Chain Awareness program https://nccd.gov.in/PDF/Cold-

	both for fresh and processed produce	chain%20Awareness%20Booklet.pdf Analysis of NDDB Model for Vegetables https://nccd.gov.in/PDF/Analysis_NDDB_veg_model.pdf All India Cold Chain Infrastructure Capacity : Gap Analysis https://nccd.gov.in/PDF/CCSG_Final%20Report_Web.pdf
	Marketing and value chain development	Directorate of Marketing and Inspection website: http://agmarknet.gov.in/ Crop specific market information sources
	Maintain quality of produce: Health & Food Safety / Traceability and Standards	TNAU AgriTech portal on Food Safety: http://agritech.tnau.ac.in/gap_gmp_glp/gap_fresh%20_%20fruits%20&%20veg.html http://agritech.tnau.ac.in/food_safetyindex.html Global Gap: https://www.globalgap.org/uk_en/ INDGAP: http://www.qcin.org/CAS/INDGAP/ Global gap India facilities: http://agriexchange.apeda.gov.in/Market%20Profile/Market_Inteligence/Annexure_III.pdf Food Traceability in Inda: http://face-cii.in/sites/default/files/final_report-version_2.pdf FAO International Code of Conduct on Pesticide Management http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/ TRACEABILITY IN FOOD AND AGRICULTURAL PRODUCTS: ITC, Switzerland publication at http://www.intracen.org/

	Government organisations and Schemes	http://agricoop.gov.in/ http://mofpi.nic.in/ http://apeda.gov.in/ http://nhb.gov.in/ http://coconutboard.nic.in/Scheme.aspx
	Knowledge and Statistics	ICAR Indian Horticulture Magazine: https://icar.org.in/node/9420 IIHR: https://iihr.res.in/documentary-video-clips-for-farmers FAO: http://www.fao.org/e-agriculture/stub-28
	Technology and Entrepreneurship	Visit ICAR – Institutions / Directorates/ Bureaux/ NRCs: https://icar.org.in/ Innovation in Agriculture: http://www.fao.org/3/CA2460EN/ca2460en.PDF Specific technologies: https://icar.org.in/content/agricultural-technologies e-learning: https://ecourses.icar.gov.in/ ICAR Publications: https://krishi.icar.gov.in/jspui/ Local University publications Local University success stories
	Protected (/Greenhouse / Shade net / Walk in Tunnel) cultivation:	https://www.ncpahindia.com/ Agriculture Skill Council of India: Curriculum and Occupational / Qualification standards: http://asci-india.com/National%20Occupation%20Standards.php
	Cold Storage / Cold Chain Development:	National Committee on plasticulture Agriculture with the Horticulture

Reading material for the trainee is to be prepared by the Training Institute based on trainers' reading material in local language either in brief or in detail based on the module and need. May share booklets or print out of detailed scientific package of practices recommended locally.

Success Stories: Illustrative

IARI	http://iari.res.in/index.php?option=com_content&view=article&id=539&Itemid=1516 http://www.iari.res.in/files/Pusa_Hydrogel.pdf
IIHR	https://iihr.res.in/success-stories

CISH	http://www.cish.res.in/success_story.php
CCRI Nagpur	https://www.youtube.com/watch?v=QwE6oFkq3F8
NRC Banana	http://nrcb.res.in/success-stories.php
CITH Srinagar	http://www.cith.org.in/index.php?option=com_content&view=article&id=83&Itemid=11&lang=en
IIVR	https://iivr.org.in/success-stories
Grapes	https://rkvy.nic.in/Uploads/SucessStory/TAMILNADU/2018/20180440133.%20GRS%20Success%20story.pdf

https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/Agricultural_Clusters.pdf

Activities prior to training by Horticulture Training Institute:

The training institute shall undertake

1. Desk Analysis:
    a. About specific commodity: State/ UT and District's Area, Production, Productivity, cost of cultivation, production, post-harvest and marketing problems etc.
    b. Road map formulated by State/UT government to develop the area/ crop / farmers income of the area including State/UT Economic Survey, Annual Report of Agriculture/Horticulture Dept., District website etc.
    c. Explore various research articles on crop production, marketing etc. of the State/ Area.
    d. Examine various study reports of Government agencies- State/ DAC&FW/ APEDA/ SFAC/MoFPI and private agencies- CII /FICCI/ASSOCHAM/ Others for the horticulture Development of the State, Specific location, India etc.
2. Preparation of training design and teaching-learning material.
    a. Preparation of training schedule with good mix of theory, practical's (both in class room and field visits) and home work (After class hours) and also physical fitness and site seeing.
    b. Participants Handbook: A brief note on each of teaching module in local language for circulation to each trainee, with the help of local technical expert.
    c. Preparation of case studies/ exercises for class room discussion / brain storming / homework.
    d. Access to internet and computers to explore the potential of technology.
    e. Identification of the best experts for each of the session and invitation of successful FPOs/ entrepreneurs/ experts for interaction session with the trainees.
    f. Identification of FPOs/Entrepreneurs/Firms/ Organisations for internship with clear Do's and Don'ts.
    g. Every trainee to come with 2 problems with respect to each of the session.
    h. Use of Audio-visual aids for teaching-learning& Good logistics for field visits
3. Identification of fields, FPOs, enterprises and operations etc. for the visit of trainees.

4. Good preparation of trainees accommodation, food (of trainees cultural context as far as possible), primary health care etc.

Services by the Horticulture Training Institute

1. **Facilities to Participants during training**
    a. Safe and joyful learning environment.
    b. Classrooms are (Venue) : IIHR, Bangalore
    c. Safe hostel accommodation and healthy Boarding.
    d. Accommodation/Hostel is at: IIHR, Bangalore
    e. Hostel check in: One day before training
    f. Hostel check out: following day of completion of course.
    g. Internet and computer systems.
2. **Material to be made available to Participants by IIHR**
    a. Training Brochure before training
    b. Reading Material during training
3. **Faculty:**

4. **Post-training activities:**
    1. Take written feedback on each of session with respect to content, clarity and delivery style, opportunity for Q&A, accommodation, food, other facilities, suggestions for improvement etc. and share action proposed in future trainings, during valedictory session.

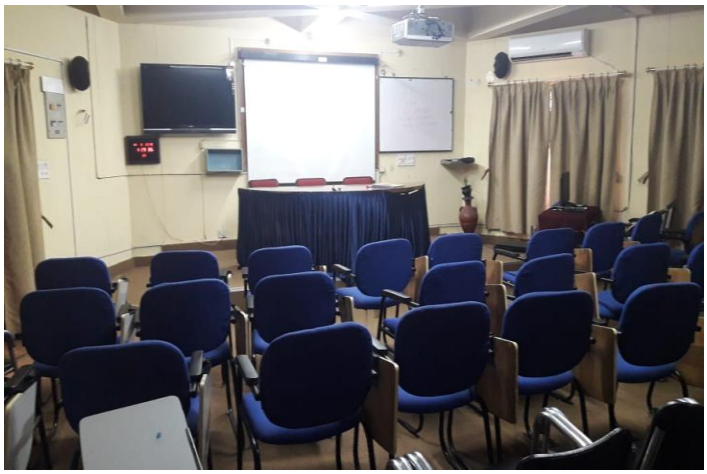
    2. Submission of training report to be submitted within 15 days of completion of EDP:
        a. Objectives, outputs and outcomes of training.
        b. Training schedule
        c. Trainee's / participant list with postal address and contact numbers.
        d. Photographs and Video (Also to be hosted by training institute and NHB)
        e. Analysis of feedback and action taken report.
        f. Action taken on networking with trainees local R&D Institution / experts for regular extension and entrepreneurship development activities.
        g. Utilisation Certificate.

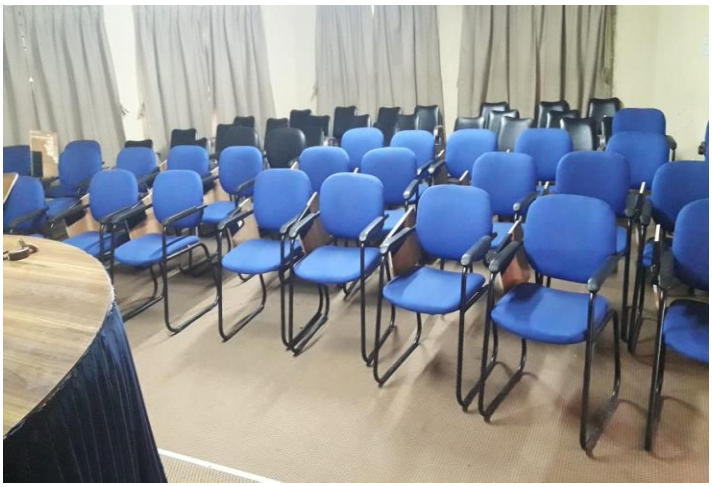
ICAR-IIHR Main Building

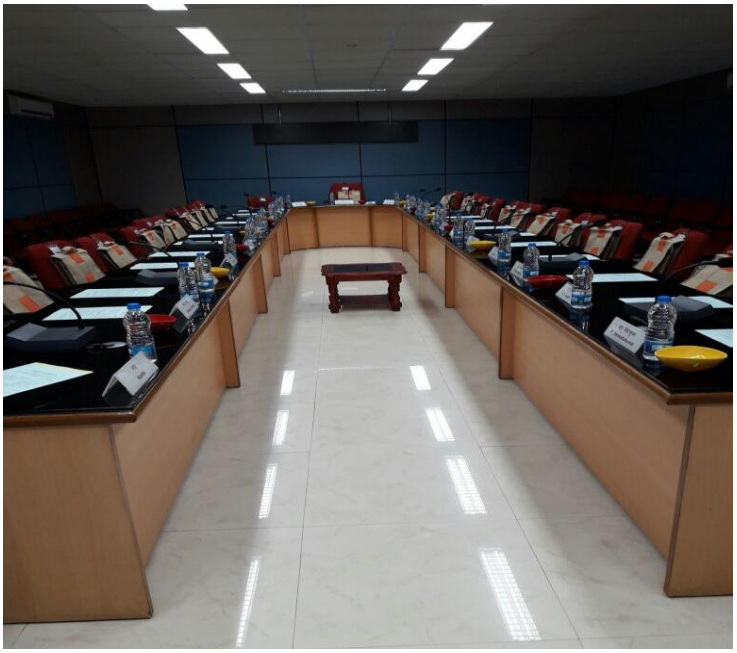
Field view of Horticultural crops

Protected cultivation of vegetables - Capsicum

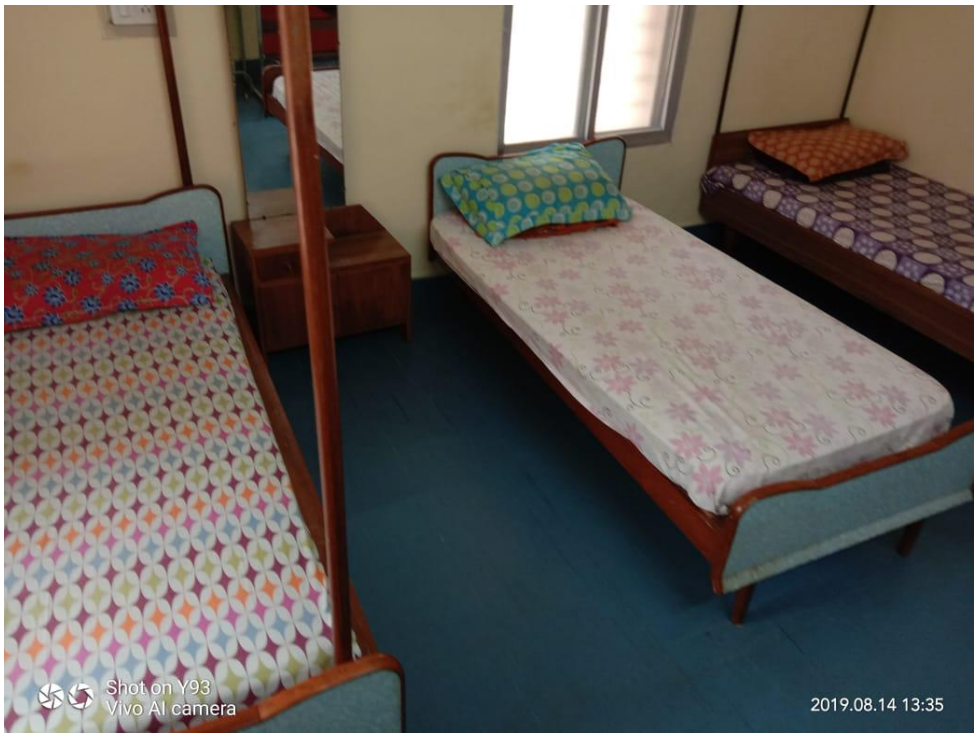
View of classrooms







View of Hostel Rooms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