



ICAR-National Research Centre for Grapes, Pune



Model

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

Crop / Activity	Cultivation of Grape
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2019-20

<i>Become Entrepreneur</i>	
	<i>Lead Change and Innovation</i>
<i>Be creative</i>	
	<i>Lead Profits</i>

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Training Programme Name	Entrepreneurship and Leadership Development Programme for Horticulture Entrepreneurs desirous of applying to Schemes of National Horticulture Board
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Introduction

India is the second largest producer of Fruits and Vegetables globally. During 2017-18 the production of Fruits is 97 Million MT and that of Vegetables is 184 million MT and that of flowers is 2.4 Million MT. The salient features of commercial Horticulture are Perishability, intense Technology, High Profitability accompanied 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 and developing commercial horticulture in the country since 1984. Appreciating both the challenges and prospects of commercial horticulture, so as to mitigate constraints and risks and maximise benefits and 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 measure taken up is encouraging farmers, entrepreneurs and applicants desirous of availing benefit under its schemes to have requisite entrepreneurship and leadership by undergoing a 10 day 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, time bound 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 10 day 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

1. Open Field Cultivation of Grape	√
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Grape growing in India is becoming very popular in tropical regions. As per an estimate 137 thousand ha area was under grapes and production was 2951 thousand tons during 2018-19. As Maharashtra and Karnataka has monopoly in grape production and contributing 95% of total grape production of country. Grapes is the highest among all the fruit crops to earn foreign exchange and is also creating employment opportunities for farmers, farm labours, exporters, traders and others who are associated with it. Following the criteria of GAP can further help the stakeholders to attain international standard and thus to explore more opportunity for export and eventually to upgrade their economic status. GAP in terms of training, pruning, vineyard management, irrigation, fertilization, crop protection, appropriate stage of harvesting, method of harvesting, packaging, storing and transporting are important and these practices also ensure the safety of the produce. Due to tropical conditions, the grape berries face higher temperature during maturity, ripening and harvesting. Supply chain in domestic market is very poor and has direct impact on bunch quality including shelf life. Many times due to high temperature, berry shattering, rachis browning and shrivelling starts in the supply chain only and before reaching at destination, berries lose their shelf life. Not only high temperature, improper handling of bunches during harvesting and transportation, lacking of grading, improper packaging materials etc. lead to heavy post harvest losses and deterioration in quality. To make profitable grape cultivation in tropical regions of country, skill development is required.

Profile of the Institute:

ICAR-National Research Centre for Grapes was established on 18th January 1997 to carry out mission oriented research programmes for resolving the problems in the production and utilization of grapes in India. It is a part of the National Agricultural Research and Education System under the aegis of Indian Council of Agricultural Research, New Delhi. It is also the nodal Centre for co-ordinating grape research in India under AICRP-fruits. Apart from in-house research, the Centre collaborates with other research institutes, universities, government departments, public and private organizations, and the grape industry for research, technology transfer and skill development.

In the two decades of its existence, the Centre has developed research infrastructure and expertise at par with international laboratories. Its strong research and technological support has made the Indian grape industry world competitive.

The Centre participates in 'charchasatra' organised by State Grape Growers Associations, in different grape growing regions before foundation and fruit pruning to educate the farmers about practices to be followed in their vineyards for obtaining good crop. Each 'charchasatra' is attended by a few thousand growers.

In 2003-04, the Indian grapes exported to European Union countries faced a complete ban due to presence of pesticide residues above the prescribed EU-MRL level. As a repercussion to this, APEDA, Ministry of Commerce recognized ICAR-NRC for Grapes as the National Referral Laboratory (NRL) to establish traceability system for control pesticide residues in table grapes for export. Due to this centre's dedicated services as National Referral Laboratory, the export of table grapes to EU restarted in 2004-05 and it improved significantly since last year with zero rapid alerts due to MRL exceedance. At domestic level, the MRL non-compliance of fresh grapes for export to EU countries has reduced from 24% in 2004 to around 5-7% in the recent years. Thus, there is increase in MRL compliance by around 17% due to the actives played by the ICAR-NRC Grapes as the National Referral Laboratory. This residue monitoring in export grapes has created awareness among domestic market as well and the centre initiated a "zero residue grape" program for domestic market since 2017-18 for better price realization for growers. As an overall consequence of this, the export has increased significantly over several years and the growers got a better price realization for their produce both at export and domestic market. On successful implementation of Residue Monitoring Plan in grape, the model was extended by APEDA to all other fruits and vegetables for monitoring pesticide residues and in peanut and peanut products for monitoring aflatoxins with ICAR-NRCG being the National referral Laboratory.

Besides these charchasatra, farmers are educated through radio talk, TV programs and articles in agri-newspaper 'Agrowon'. Weekly advisory by the scientists of this Centre published in newspaper Agrowon is religiously followed by the most grape growers. The same is displayed on our website also. Before using new pesticide or other agrochemical available in the market growers demand bio-efficacy studies conducted at NRCG. Common grape growers are very demanding for latest information on grape production technology.

NRCG also conducts on farm research trials cum demonstrations to fine tune the technologies developed by them. Weather forecast based advisory is widely adopted by the grape growers. Further, scientist of NRCG conducted trials on growers' vineyard to demonstrate recommended irrigation schedule, subsurface irrigation and partial root zone drying techniques for improving water use efficiency in drought prone area. About 40% saving of water as compared to farmers practice was demonstrated with sub-surface irrigation over farmers' practices.

The mandate of the institute is:

- Strategic and applied research on safe grape production and productivity.
- Transfer of technology and capacity building of stakeholders for enhanced and sustained production of grapes.
- National Referral Laboratory for Food Safety and Pesticide residue in fruits.
 - Since its inception, the institute is closely working with grape growing community of the country. The institute has gained trust among the grape growers, as scientists technically support them in solving their problems and making grape growing profitable under challenging conditions. The institute organizes different type of trainings for stakeholders.

Basic infrastructure and collaboration to be in place

1. Competent Faculty.
2. Research expertise and farm / Demonstration experience.
3. Excellent classrooms with all Audio-visual equipment and aids including PPT facility.
4. Has good networking with experts across India, to invite best of the faculty in a particular area of expertise.
5. Has collaboration with entrepreneurs and Industry.

Previous experience:

ICAR-NRCG has conducted more than 131 training programs on latest techniques of viticulture for grape growers and other stakeholders to bring out qualitative improvement in knowledge and skill development. The trainings were conducted in the following areas:

- Establishment of Grape Vineyard
- Transfer of Technology for Production of Export Quality Grapes
- Grapevine Cultivation and its Value Added Products
- Nutrient Management in Grapes
- Judicious Use of Plant Growth Regulators in Grapes
- Plant Protection in Two Pruning and Single Cropping System in Viticulture
- Analysis of Heavy Metals in Fruits and Vegetables
- Methods for estimation of agrochemicals,
- Sampling methods

The officials of State Departments of Horticulture of major grape growing states i.e. Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu also approach this Centre to train their extension staff and progressive grape growers.

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 to be submitted.
 - 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 cultivar/rootstock and source of quality planting material based on market demand and sustainability.
 - b. Technology: Production technologies including vineyard establishment, canopy management, training, pruning, water and nutrient management, application of bio-regulators, effective and safe plant protection measures, mechanisation and Automation.
 - c. To know scientific production, harvesting and post-harvesting practices, technology and management and gap analysis with that of the current practices, technology and management of trainees.
4. Harvesting, Post-Harvest Management practices, technologies and Infrastructure
 - a. Maturity standards, time and method of harvesting, post-harvest handling, grading, packing and labelling
 - b. To be aware of Post-harvest including pre-cooling, storage practices, protocols, technologies and transportation

- c. To know required infrastructure- Supply Chain/ Cold Chain and Marketing infrastructure and Gap analysis to the context of trainees.
- 5. Processing and value addition:
 - a. Processing of grapes in different products like raisins, juice, wine, etc.
 - b. Waste to wealth for grape varieties used for juice and wine industry
- 6. Marketing and value chain development
 - a. To know value chain and document current value chain for trainees.
 - 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; Variety and targeted markets and preparing crop calendar for fulfilling GAP requirements.
 - 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. Supply/ Cold-chain development both for fresh and processed produce for domestic and export market
- 8. Producing quality produce: Healthy, Food Safety / Traceability and Standards
 - a. To know Global /National norms of Food Safety & traceability- Good Agricultural Practices, and standards, MRL, IPM, logistics, etc. Encourage trainees to document a roadmap for availing certification in 1 year time.
- 9. Cluster development / Collaborative farming: What is cluster? Essential elements? To know importance of cluster approach,
- 10. Government organisations and Schemes related to Horticulture and laws to be complied.
- 11. Horticulture Statistics sources including DAC&FW website and State Horticulture Dept. website.
- 12. 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 field visits etc.

Outputs expected: (As on the last date of 6 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 minimum score of 75 % 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. Food safety (Good Agricultural Practices), traceability, standards etc.
 - d. Documentation of analysis of current scenario for trainees context of 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. Successful completion of the project with right technology and processes complying with all NHB Scheme requirements.
2. Reduced cost of production; improved crop health, productivity & reduced losses.
3. Improved food safety, certification, standards compliance- at least process is initiated.

4. Improved infrastructure.
5. Improved profits/ net income.

Programme in Brief

Training Programme Name	Entrepreneurship and Leadership Development Programme for Horticulture Entrepreneurs			
Duration	6 working days			
Participant Target Group	Individuals desirous of availing NHB benefit under Scheme No. 2 and also for those who want to improve their knowledge and leadership in protected commercial horticulture.			
Training Coordinator with Designation and Address Tel, Mobile and email id	Dr Ajay Kumar Sharma Principal Scientist (Horticulture) ICAR-National Research Centre for Grapes, Manjari Farm PO, Solapur Road, Pune-412307 Phone: 02026956065, Fax: 020 26956099 ajay.sharma1@icar.gov.in			
Languages	Hindi, English, Marathi			
Training calendar for 2019-20	Month	Last date for Registration	Training reporting dates	Training Dates
	December 2019	30 th Nov, 2019	15/12/2019	16-21 Dec, 2019
How to Apply	Through link on website: https://nrcgrapes.icar.gov.in/			
Next review/ revision of Training Design	February 2020			
Batch size and cost and Payment system	Batch size	Course Fees	Hostel: Accommodation, Boarding: BF+L+D + Morning Tea + Afternoon Snacks	Total cost
	15	8265/-	The trainees will arrange their own accommodation, food and transport facilities since NRCG does not have these facilities. However, working lunch and teas will be arranged.	Actual fee will be calculated based on farmers number.
	10	935/-		
	5	14160/-		

	<p>Payment system and address: Online NEFT/DD/Cards</p> <p>Details are as under: In favour of “ICAR unit -NRC for Grapes” payable at Pune. Bank details are as follows: Name of the Bank: State Bank of India Branch: Hadapsar, Pune Account number: 11182680031 IFSC Code: SBIN 0009062 MICR No.: 411002041</p> <p>POS is also available for transferring money through card.</p>
Enrolment	Is voluntary on the part of trainee and on his/her submission of willingness in writing to undergo training.
Certificate	Upon successful completion of training with 75% marks in final assessment, the candidates are awarded completion certificate with marks.
NHB & HTI Role	<ol style="list-style-type: none"> 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 95% 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 (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.

6 days training schedule

Session	Module	Learning	Expert
	Registration	Registration Prior-Assessment of knowledge, attitude and skills	Coordinator
Day1 Session1	Orientation / Inauguration	<ul style="list-style-type: none"> • General discipline in class room (Do's and Don'ts) • Every trainee to share their introduction with expectations. • Motivational Talk 	Successful entrepreneur/ Coordinator
Day 1 Session 2		Present status of grape at international level, trade and Indian scenario	Director
Day 1 Session 3 and 4	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 Dons, 4. List of documents to be submitted and Agenda and Checklist. 5. Technology standards/ Specifications etc. 6. Issues with Banks. 7. Common reasons for rejection of Projects at NHB. 8. Q & A on Queries.	DD NHB
Day 2 S1	Selection of cultivar	<ol style="list-style-type: none"> 1. Agro-climatic, 2. Varieties and rootstocks with their characteristics 3. Priority of consumer preference -choice characteristics of commodity. 4. Selection of economically profitable and sustainable cultivar /rootstock 	
Day 2 S2	Establishment of vineyards	<p>Establishment of vineyards including site selection, land preparation, layout, planting, row direction, erection of trellises, etc</p> <p>Cost of vineyard establishment</p> <p>Do's and Don'ts during vineyard establishment</p> <p>Use of Quality Planting Material and nursery management practices</p> <p>Sources of Quality Planting material.</p> <p>Method of vegetative propagation for production of planting material</p>	

<p>Day 2 S3 and 4</p>		<ul style="list-style-type: none"> • Different types of training systems • Importance of training and prunings • Care of newly planted saplings • Recut, support, • Cane maturity, • Canopy management • Fruitfulness issues • Application of hydrogen cyanamide for uniform and early sprouting • Weed management 	
<p>Day 3 S, 2 and 3</p>		<ol style="list-style-type: none"> 1. Agro-climatic, soil health, and water quality 2. Soil & Water quality: requirements and remedies 3. Phenological stagewise water requirement, drip irrigation & fertigation practices, WUE, irrigation scheduling 4. Diagnosis of nutrient deficiencies, Nutrient Management (Macro & Micro) / Manuring including Bio-fertilizer: Diseases & virus, symptoms of different biotic stresses, 5. Farm mechanisation & Automation- Tools and drippers, nozzles etc. Care to be taken in procuring inputs 	
		<ol style="list-style-type: none"> 6. Sampling process, 7. Soil, water and petiole analysis and importance 8. Importance of plastic in grape production, cost components for plastic cover, opportunities of grape cultivation under plastic, DSS 9. Climate change, suitability of regions for grape growing 10. Importance of plastic in grape production, cost components for plastic cover, opportunities of grape cultivation under plastic 	

S4	Visit of farm and nursery	Field demonstration including training, pruning, Pinching, Thinning, Side shoot pinching, media, pot filling, observations etc.	
Day 4 S1 and 2	Harvesting, Post-Harvest Management / Infrastructure- to enhance holding life and to reduce post-harvest losses	<ol style="list-style-type: none"> 1. Post-Harvest losses and Waste scenario in the country and measures to utilize for earning 2. Proper technique & do's and don'ts of Harvesting; 3. Factors affecting harvesting-maturity, size, colour, time etc. 4. Careful Post-harvest handling / practices including use of crates, reception area, cleaning, grading (standards), Packaging, labelling, pre-cooling & Preservation & Traceability 	
	Processing / Value Addition	<ol style="list-style-type: none"> 1. Processing / Preservation- & Value Addition <ul style="list-style-type: none"> • By product utilisation- • Use of renewable energy on roof tops for processing energy 	
Day 4 S3 and 4	Grape export, Treatability and standards	<p>Food Safety & Certification & Traceability activities: at pre-planting, Harvesting and Post-harvest.</p> <ul style="list-style-type: none"> • Good Agricultural Practices- GLOBAL GAP • Codex Alimentarius/ <p>Health: Impart knowledge of various health hazards relevant to work place including that of machinery & vehicles, chemicals usage, contamination; safety checks, farm personnel safety measures (protective clothing, gloves /gadgets) and first aid; Waste disposal, minimum damage to environment, emergency protocols for health and safety.</p>	
		<p>Standards</p> <ul style="list-style-type: none"> • GSCP- Global Social Compliance Program; 	

		<ul style="list-style-type: none"> • Social code: GRASP • Standards • EU MRL ;FAO-IPM <p>GrapeNet and importance in export of grapes</p>	
Day 5 S1 and 2	Diseases and management	<p>Crop health and biologicals, Aerial spraying, Crop monitoring, Pest and Disease Surveillance, Weather Forecasting, Spraying technologies, different types of nozzles, Management of different diseases in vineyards</p>	
Day 5 S3 and 4	Insect-pest management	<ul style="list-style-type: none"> • Integrated insect-pest management, natural enemies of insects, Bio-pesticides, Weather forecast based advisories and importance, Advisory services • Use of IT, Automation-Drones, AI etc. 	
Day 6 S1	Knowledge and Statistics	<p>Potential niche Export markets</p> <ul style="list-style-type: none"> • Global Scenario- product wise; Success story, • State/UT s potential, Challenges for Export markets- sea based; • GrapeNet and utilization • APEDA <p>Linkage with Distribution hubs (Netherland)</p> <p>Potential niche Domestic markets:</p> <ol style="list-style-type: none"> 1. Indian Scenario- product wise; Challenges for Domestic – road based 	
Day 6 S 2	Supply/ Cold-chain development both for fresh and processed produce Agri/Horti-Logistics	<ol style="list-style-type: none"> 1. What is Supply Chain and Cold Chain? Advantages. 2. <u>For Local sale</u>: where product selling cycle is < 48 hrs- to have aggregation, staging platforms at village level for sorting and grading and to consolidate volume for viable truck loads. 	

		<p>3. For Long distance: where product selling cycle is > 48 hrs- require aggregation platforms, pre-conditioning supply & cold chain management- Modern pack house, integration with reefer transport.</p> <p>4. Required infrastructure Gaps,</p> <p>5. Strategy for phase wise Supply/ Cold Chain development in trainees context.</p> <p>6. For domestic market- Local & Distant</p> <p>7. For export market.</p> <p>8. Annual Maintenance, Contract of Infrastructure.</p>	
S3	Marketing and value chain development	<p>Marketing Basics:</p> <p>1. Agmark: Importance, procedures, benefits</p> <p>2. Market differentiation- Organic, Alcohol free, Taste etc.</p> <p>3. Market Driven Production- Concept: What? How? Challenges? Solutions</p> <p>4. Promotion strategy: Branding; Differentiation of product</p> <p>5. e-marketing</p> <p>Market Intelligence / Transparency in Market prices/ Assimilation of Market Information /</p> <p>6. Knowing end market prices- Local market and distance market; from reliable sources, Mandis, competitors through Media-print, AIR, TV, internet, commission agents etc.</p> <p>7. Analyse market information season wise.</p> <p>Models:</p> <p>8. NDDDB-Mother Dairy/ SAFAL Model- Front end distribution hub and retail outlets.</p>	

		<p>9. HOCOMS model: Both back end ownership of collection centres and transport and front end distribution, outlets.</p> <p>10. Big Basket Model.</p> <p>11. Study of pricing / price realisation across the models</p> <p>12. Supply to Distribution hub by Buyer like HOPCOMs or by FPO as in case of Mothers; dairy SAFAL.</p>	
S4	Evaluation 1 Hour	Training evaluation /Test on 1. Knowledge 2. Skills 3. Attitude	
	Feedback 30 Min		
	Discussion on Feedback		
	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	For the trainee
1.	Economic Potential and Specific State/ UTs context and Success stories.	<p>Horticulture Statistics at a glance: http://agricoop.gov.in/statistics/publication-reports</p> <p>World fruit and vegetable map: 2018: Robo Bank https://research.rabobank.com/far/en/sectors/regional-food-agri/world_fruit_map_2018.html</p> <p>APEDA AGRIEXCHANGE: http://agriexchange.apeda.gov.in/</p> <p>ICAR institutions publications on specific crop CII / FICCI/ASSOCHAM/ PHDCC reports</p> <p>http://www.fao.org/docs/eims/upload/210971/global_issues_paper.pdf</p> <p>Success stories: http://agritech.tnau.ac.in/success_stories/sstories_horti_2015.html</p>	
2.	Personal skills development	Internet and youtbue	
3.	Selection of cultivar and Production	ICAR institutions publications on specific crop Package of practices of specific crop (s).	

	practices for high productivity	e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions. ICAR e-courses: https://ecourses.icar.gov.in/	
4.	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	
5.	Processing / Value Addition	ICAR / Any reputed R&D Institution publications e-learning: videos from authentic sources- ICAR/ SAU/SHU/Global Institutions.	
6.	Supply/ Cold-chain development both for fresh and processed produce	Cold Chain Awareness program https://nccd.gov.in/PDF/Cold-chain%20Awareness%20Booklet.pdf Analysis of NDDDB Model for Vegetables https://nccd.gov.in/PDF/Analysis_NDDDB_veg_model.pdf All India Cold Chain Infrastructure Capacity : Gap Analysis https://nccd.gov.in/PDF/CCSG_Final%20Report_Web.pdf	
7.	Marketing and value chain development	Directorate of Marketing and Inspection website: http://agmarknet.gov.in/ Crop specific market information sources	
8.	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_Intelligence/Annexure_III.pdf Food Traceability in India: 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/ GRASP: Global GAP Risk Assessment on Social Practice The Global Social Compliance Programme GSCP https://www.gscpequivalenceprocess.com/	
9.	Finance, Credit & Farm/ Project & Risk Management	Model DPR Templates for NHB Schemes ww.nhb.gov.in	
10.	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	
11.	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	
12.	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	
13.	Technology and Entrepreneurship	Visit ICAR – Institutions / Directorates/ Bureaux/ NRCs: https://icar.org.in/ <u>Innovation in Agriculture:</u> 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	
14.	Protected (/Greenhouse / Shade net / Walk in Tunnel) cultivation:	National Committee on plasticulture Agriculture with the Horticulture https://www.ncpahindia.com/ Agriculture Skill Council of India: Curriculum and Occupational / Qualification standards: http://asci-india.com/National%20Occupation%20Standards.php	
15.	Cold Storage / Cold Chain Development:		

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, practicals (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) :.....
- c. Safe hostel accommodation and healthy Boarding.
- d. Accommodation/Hostel is at:
- 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 Horticulture Training Institute

- 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.

Photographs of Campus/ Class rooms / Hostel / Technology / Infrastructure



What is cluster ? When a group of individual growers or farms are called as Cluster?

Essential elements / components of a cluster:

Cluster sprout: Large scale areas where a particular crop is under cultivation already, but lack all the characteristics of Cluster.

Cluster: A cluster is a geographic concentration of firms that work in a related value chain. (Professor C. Leigh Anderson 2015: Univ. Washington)

Principle (s):

1. Firms that operate close to related firms and supporting institutions are often more innovative and, therefore, more successful in raising productivity than firms that operate in isolation.
2. To counter increasing fragmentation in farm holding size, by promoting collaboration in land holders. This is expected to regain economy of scale- on inputs and on outputs.

The essential characteristics / elements of a horticulture cluster are :

1. Geography: Located within an identifiable & as far as practicable, contiguous area.
2. Specialisation: Similarity in the commodity (s) production and complementarity in the methods of production, Channels for communication among the members, quality control and testing, technology and marketing strategies/practices energy consumption, Common challenges and opportunities etc.
 - i. In case of Fruits: Commodity specific
 - ii. In case of Vegetables: 4-5 crops of similar nature capable of rotation.
 - iii. In case of Floriculture: Commodity /Similar commodity specific
3. Intensive linkages viz., Horizontal, Vertical and Support relationships
 - a. Horizontal relationships among producers:
Cooperatives / FPOs/ Companies/Smallholder business consortia but for the NHB scheme it is within the FPC model.
 - b. Vertical relationships -among
 - i. Agricultural producers,
 - ii. Production Input Suppliers,
 - iii. Production, Harvest and Post-Harvest Service providers
 - iv. Financial Institutions,
 - v. Processors and exporters,
 - vi. Logistics/ Supply Chain providers
 - vii. Branded buyers and retailers;

Colocation of actors at multiple parts of the value chain is one of the defining features of agribusiness clusters. In such contexts co-location through agribusiness clusters can reduce transaction costs, and increase productivity and innovation.

- c. Support relationships between producers and facilitating organizations:- that reinforce the quality, efficiency and sustainability aspects of the chain
 - i. Governments, business service providers,
 - ii. Research institutes, universities and
 - iii. non-government service organizations).
 - iv. Cluster members may benefit from linkages from supporting institutions that provide specialized training, education, information, research and technical support (Porter, 1998). Clusters also often involve private sector financial firms who provide access to financial services and investment.

- 4. Critical mass of Actors: Number of growers and size: Critical mass of actors, resources and competencies necessary for a cluster to effectively lower transaction costs, facilitate information flows, provide access to specialized factor markets and interact effectively with local, regional and national consumers. Area of willing growers with produce volume capable of viable capacity use of the post-harvest infrastructure components while retaining priority to reach distant markets.

- 5. Producer ownership: Holds ownership of trading / marketing of produce: Removes intermediary traders/Bypass wholesale traders. Deals with buyers / retailers directly.

- 6. Shall serve identified Targeted Market (s).

- 7. Undertake promotion of produce with collective branding

- 8. Evolution and diversification of commodity trade with time and entrepreneurship- Fresh produce, processing and Export, new markets.

- 9. Inclusiveness : have provision for enrolling new members to enable prospective entrepreneurs and utilise facilities / services within set limits.

- 10. Generate innovation and promote evolution of the business model.

India's Success Story: Sahyadri Farms: Farmers Producers Company