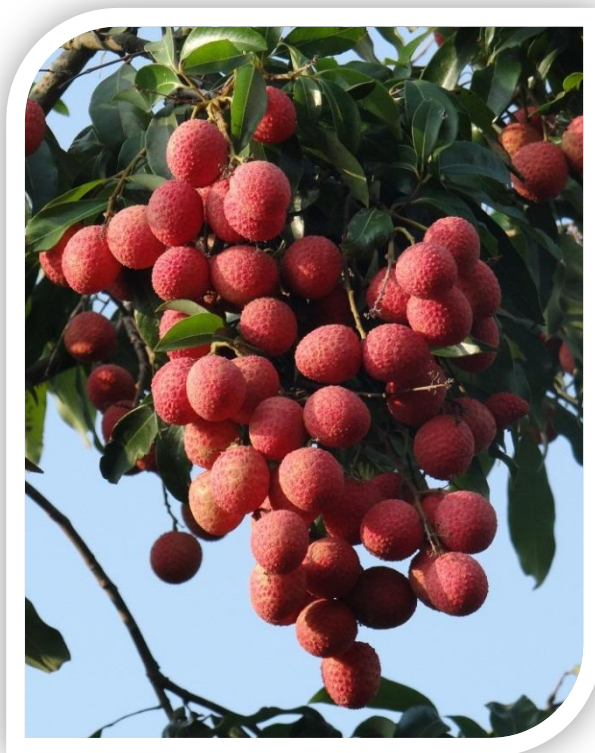


Detailed Project Report (DPR) for seeking financial assistance from NHB



UNDER SCHEME 1:

Development of Commercial Horticulture through Production and Postharvest Management of Horticulture Crops (The Litchi)

Developed with technical inputs from

ICAR-National Research Centre on Litchi
Mushahari Farm, Mushahari
Muzaffarpur – 842 002, Bihar
www.nrclitchi.org ; Email: nrclitchi@yahoo.co.in

Detailed Project Report (DPR) for NHB Scheme No.1 (Litchi)

Scheme.1	Development of Commercial Horticulture through Production and Postharvest Management of Horticulture Crops (The Litchi) <ol style="list-style-type: none"> 1. Open field condition 2. Integrated Postharvest Management
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Crop			Tick mark
Scheme components	1. Open field condition of NHB specified crops (The Litchi)	Within overall cost ceiling	
		+Farm Mechanisation	
		+Good Agri. Practices (GAP)	
		+Plastic Mulching	
	2. Integrated PHM (Litchi)		
	2.1.Integrated Pack House		
	2.2.Pack house		
	2.3.Pre-cooling unit		
	2.4. Cold Room (Staging)		
	2.5. Mobile Pre-cooling unit		
	2.7 Primary Processing		
	2.8.Reefer Van		
	2.9 Retail outlet		

Detailed Project Report (DPR) duly to be signed by
the applicant (s) / authorised person (in case of legal entity) on each page with date

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	14. Month wise operational chart / Implementation schedule	
	15. Backward and Forward linkages.	
	16. Manpower (Skilled & Unskilled labour etc.) availability	
	17. Employment generation	
	18. Infrastructure (Power, Fuel, Water, Plant and Machinery, connectivity, Effluents treatment etc.)- Required, Already available, Gaps and the management.	
	19. SWOT Analysis	
	20. Monitoring and evaluation	
4	NHB Scheme under which the project is proposed with rationale / justification.	
5	Project details	
5.1	Agro-climatic suitability / feasibility	
	1. Origin, introduction and distribution of crop in the said location, India and in the world (briefly)	
	2. Agro-climatic / Horticultural zones and suitability of the crop (s)	
	3. Soil type and latest health-suitability for the crop	
	4. Water (irrigation) source, availability, Quality and suitability	
5.2	Market viability	
	1. Commercial and Nutritive importance / significance, composition and Uses	
	2. Target Market (s)	
	3. Statistics: India and State: Area, Production and Productivity in the District, State and India for the last 5 years	
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	5. Demand and Supply gap	
	6. Global producers- Country, Area, Production, Productivity and global market share in the last available 5 years.	

	7. International trade and potential (for export oriented projects)	
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	9. Price variation of commodity in the State and nearby markets	
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	12. Value Addition scope	
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	6. Project Financing	
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	2. Percentage of Term loan against total project cost	
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	7. Proposed Cash flow Statement for repayment period.	
	8. Proposed Profit & Loss Account	
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	13. Depreciation	
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	9. Farm record keeping/ Maintenance proposed	
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	5.4.1.Land development	
	5.4.2.Selection of Quality Planting Material	
	1. Recommended and popular Cultivars- varieties/hybrids, their specific characteristics, requirements and yields.	
	2. Cultivar/Hybrid/Variety selected and Criterion adopted for selection	
	3. Propagation methods.	
	4. Accredited / Good Nurseries in the area	
	5. Planting material-source, quality and suitability	
	5.4.3.Orchard / Site planning, Lay out and management	
	1. Planning, establishment and layout systems	
	2. Land preparation	
	3. Planting Season / time and density and transplanting	
	4. Water and Nutrientmanagement	
	5. Intercultural operations including Weed management	

	6. Plant canopy architecture management/ training and pruning	
	7. Use of Pollinators & pollinisers	
	8. Use of Plant growth regulators	
	9. Flowering& fruiting	
	10. Integrated Pest and Disease Management and Food Safety measures	
	11. Physiological disorders- causes, preventive and management measures.	
	12. Special problems if any	
	5.4.5.Farm Structures and Mechanisation	
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	2. Farm Mechanisation	
	5.4.6.Flower/Fruit care management and Harvesting	
5.5	Postharvest Management	
	1. Post-Harvest infrastructure scenario in horticulture sector in the State and specially for the proposed crop / component	
	2. Product/ Process Flow chart	
	3. Lay out / Floor Plan of postharvest operations	
	4. Post-harvest operations	
	1. Sorting / Grading	
	2. Cleaning / Washing	
	3. Pre-treatments	
	4. Packaging	
	5. Labelling	
	6. Cold storage	
	7. Transport	
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	1. Integrated Pack house	
	2. Pack House	
	3. Pre-cooling unit	
	4. Cold Room (Staging)	
	5. Mobile Pre-cooling unit	
	6. Primary Processing	
	7. Refer van	
	8. Retail outlet	
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5.6	Marketing	
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	2. Aggregation & Assembling: Marketing infrastructure	
	3. Market Institutions and agents	
	4. Demand and Supply trends and forecast both in local and National markets.	
	5. Traceability record	
	6. Proposed value chain / method of Marketing by the Applicant	
5.7	Value addition / Processing	
6	Technology providers	
	1. ICAR /CAU/ SAU/SHU / Research Stations and Experts names	
	2. Experts-whose services are availed	

	3. Agri/Horti-Business incubators	
7	Food Safety -With /Without GAP certification	
	1. GAP Certification if any	
	2. Food safety measures	
	1. Pre-planting	
	2. Crop husbandry	
	3. Harvestings	
	4. Post-harvest	
8	Innovation if any	
9	Profitability of the project (Horti-business): Critical observations of Applicant	
10	Checklist	
11	Declaration from Crop Expert and Project Finance Expert	
12	Self-declaration by the Applicant	
	Annexure	

Project at a Glance (To be filled by applicant)

1.	Applicant (s)/ Legal entityName		
2.	Constitution / Applicant nature / beneficiary		
3.	NHB Scheme for which DPR is made		
4.	Project Activity		
5.	Nature of project- Green field/ pre-existing- expansion / component specific		
6.	Products, By-products and services		
7.	Project Area and Survey /khasra/ Gat/Dag No.		
8.	Project Site Address with Postal Code and Police Station Name		
9.	Agro-climatic suitability		
10.	Research institution whose technology and package of practices are proposed to be followed		
11.	Existence of similar project activity in the said District		
12.	Whether the project is located in the crop cluster/ hub/ belt		Yes/No
13.	Project economic period/ economic life		
14.	Total Project Cost		
15.	<ul style="list-style-type: none"> Open field condition Integrated Post Harvest Management Total 		
16.	Project completion period (in months)		
	Expected Implementation timeline	Commencement	
		Completion	
17.	Total Eligible Project cost as assessed by the Applicant as per NHB guidelines		
18.	Bank/ Financial Institution identified for Term loan		
19.	Proposed Means of Finance	Promoters contribution (in Lakh Rs.)&%	
		Bank Term loan (in Lakh Rs.) &%	
		Un secured loan (in Lakh Rs.) &%	
		Total	
20.	Likely Employment generation (man days)		
21.	Security		
22.	Gestation period		
23.	Projected	Current Ratio other than export units	
24.	Key Financial Parameters	CR-Export units	
		IRR /BCR	
		DSCR*	
		Average DSCR	
		Debt to Equity Ratio i.e DER	
		TOL/TNW	
		Promoters Contribution	
		Break Even Point	
		Security Coverage Ratio	
		Repayment period	
25.	Productivity expected (in MT/quintal/kg/numbers)		
26.	Likely Gap in productivity compared to National /Global average		
27.	Potential Market (s)for produce and distance from the project site		

1.About the Applicant / Promoter and his/her entrepreneurship(To be filled by applicant/promoter/legal entity/entrepreneur)

A. About Applicant / Promoter

1.1.In case of Individuals or Group of farmers (if applicable)		
Individual		
1. Name of Farmer / Entrepreneur/Individual/ Proprietor		
2. Parents or spouse name of Individual		
Group of Farmer growers / SHG- Promoters		
1. Name of Group		
2. Names of all members of group with their father, mother/husband/ wife name		
1.2.In case of Legal entity (if applicable)		
Name / Title		
1. Incorporation / Registration number & date of registration		
2. Act under which Registered		
3. Registering authority		
4. Name of Promoter / CEO/CMD/MD/		
5. If it is FPO/ FPC/ Producers Co-op society / Growers Co-operative Marketing federation- Please specify		
6. If it is Reg. Society/ Company/ Corporation / Partnership firm / Proprietary firm- Please specify		
7. Name of Promoter		
8. Status of the promoter / applicant in the legal entity-please specify		
9. Whether the promoter / applicant is authorised by the Legal entity- Yes/No		
10. In case of Company/partnership firms / legal person <ul style="list-style-type: none"> a. Certified copy of Company/Partnership incorporation/ registration certificate issued by Competent Authority, as applicable b. Certified copy of MoA/Bye Laws c. Certified copy of Board of Directors Resolution duly passed and authorizing signatory of application to apply for IPA d. Certified copy of latest Audit Report, if applicable <ul style="list-style-type: none"> i. (are to be made available in case the project and the application is considered for processing.- State Yes/No 		
11. NGO- Specify		
1.3.Government Institutions / Organisations-- Please specify (if applicable)		
(i) Marketing Board / Agricultural Produce Marketing Committee APMC		
(ii) Municipal Corporation		
(iii) PSU/ Agro-Industries Corporation		
(iv) ICAR/CAU/SAU/ Government R&D Institution		

1.4.Statutory registration		
a. PAN No		
b. Aadhaar No.	Yes/No	
1.5.Correspondence Address	Postal Address with PIN code	
	Telephone	
	Mobile	
	Email id	
	Fax if any:	
1.6.Project / Site Address		
1.7.Social Category (In case of legal entity the CEO and Board of Directors social category is to be mentioned)	General / SC/ST	
	OBC	
	Minority (Muslim/Christians/Sikhs/Buddhists/Parsis/Jains)	
	In case of SC/ST applicants a Certified copy of Caste Certificate issued by Competent Authority is to be enclosed. In case of others a self- declaration is to be enclosed.	
1.8.Location: TSP / NE Region / Hilly States	In case of TSP a self-attested copy of notification is to be enclosed.	
1.9.Gender	Male / Female/Transgender	

B. Applicant/ Promoters' Entrepreneurship:

1.10.CV / Biodata of Applicant (s) / Promoter (s) (Authorised by legal entity)in brief: (If applicants are more than one, all are to provide their CV / Biodata)

- a. Name of Applicant/ Promoter:
- b. Fathers' name:
- c. Date of Birth
- d. Place of Birth (village/town/city, District and State)
- e. Permanent Address:
- f. Educational qualification (Higher Secondary, Under graduation Degree and above)

Education Matric/ UG/PG)	Name of education / specialisation	Board / College / University/ Institute	Year of Pass	Remarks

- g. Current profession.
- h. Previous profession during the last 5 Years.
- i. Experience- General and Horticulture
 - a. General (Other than Horticulture)
 - b. Horticulture

1.11.Commitment by the applicant: In case the project is approved for pre-IPA, the promoter / CEO/CMD should undergo a 2 Weeks (min.10 working days) project specific training programme in case of Open field condition and protective cover (with or without PHM component) and a minimum of 1 Week programme in case of standalone PHM component in one of the ICAR/CAU/SAU/SHU/ Research Station/ Centres of Excellence/ related Central or State Government institution/ others as found appropriate / approved by NHB.

In case of a Partnership firm/ Company / Legal person

- a. Objectives as per Memorandum of Association (MoA) / Rules:

- b. Professional history of Legal entities Farmers Producer Organisations (FPOs), Self Help Groups, Partnership/ Proprietary Firms, NGOs, Companies (as a Board of Director), Corporations, Cooperatives, Co-operative Marketing federations/ Government Institutions.

- c. Management structure if it is a company/ firm etc depicting the position of the applicant.

2.Details of benefits availed/ proposed to be availed by the applicant- Either individually or as a member of Association of growers, Group of Farmer Growers/consumers, Farmers Producer Organisations (FPOs), Self Help Groups, Partnership/ Proprietary Firms, NGOs, Companies (as a Board of Director), Corporations, Cooperatives, Co-operative Marketing Federations from (i) NHB and (ii) other Ministries/ organisations of Central Government and (iii) State Governments including NHM for Horticulture related projects.

Note: The beneficiary should be truthful. In case any information is received later on at any stage about his/her availing of benefit which is not disclosed hereunder will entitle NHB to reject the current proposal and recover the funds if already released.

2.1. In this / proposed project and location:

1. Whether the proposed project proposal has been submitted for consideration under any State Government or Central Government Scheme for financial grant? If yes give details.
2. Whether any subsidy has been availed from the Board, other Central Govt. organisation or State Government for the same activity on the same piece of land, khasra/ Gat/Dag/ etceither in his / her own name individually or in the name of his/her family members or through any legal entity in which he/she is the beneficiary either in the same location, project. - Yes/ No. If Yes, Please provide details

Constitution – Individually or in any form	Ministry/ Organisation	Scheme Name	Project / Activity	Project Location	Land Survey No	Eligible Project cost (Rs.in lakhs)	Total subsidy/ grant (Rs.in lakhs)	Current status of project- Operational / underutilised / closed

2.2. In earlier/ any other Project (s)

2.2.1. NHB : Either in his / her own name individually or in the name of his / her family members or through any legal entity in which he / she is the beneficiary either in the current proposed project location or any other location. Whether any assistance in the form of soft loan and subsidy has been availed earlier from the National Horticulture Board? If yes, give details thereof

Year	Scheme Name	Project / Activity	Project Location	Land Survey No	Eligible Project cost	Total subsidy /grant availed	Current status of project- Operational / underutilised / closed

2.2.2. Central Government- Ministries / Organisations: Either in his / her own name individually or in the name of his / her family members or through any legal entity in which he / she is the beneficiary either in the current proposed project location or any other location.

Year	Scheme Name	Project / Activity	Project Location	Land Survey No	Eligible Project cost	Total subsidy / grant availed	Current status of project- Operational / underutilised / closed

2.2.3. State Governments: Either in his / her own name individually or in the name of his / her family members or through any legal entity in which he / she is the beneficiary either in the current proposed project location or any other location.

Year	Scheme Name	Project / Activity	Project Location	Land Survey No.	Eligible Project cost	Total subsidy /grant availed	Current status of project- Operational / underutilised / closed

2.3. Operational status of earlier Scheme under NHB and other Central Ministries and State Government.

Year	Organisation / Ministry	Activity	Project Operational status (Running or completed)	Annual Turnover (previous Year)	Exports if any	Profitable or loss making	Remarks / Reasons

2.4. Please provide map of earlier / other subjects and this project- Key map of project land showing project details and land boundary details

2.5. Provide the following details:

- a. Have you ever been refused / denied subsidy claim from NHB, NHM, APEDA, NCDC, MoFPI? If Yes, please provide details of (i) Project code, (ii) Name of Applicant, (iii) Address (iv) Project activity etc. and the reason for such refusal / denial:

- b. If you were a recipient of Government subsidy, have you / your Bank/FI ever been asked to refund the subsidy / call back ?If Yes please provide details of (i) Project code, (ii) Name of Applicant, (iii) Address (iv) Project activity etc. and the reason for such refusal / denial:

Attention:

In case the project application is considered for Pre-IPA, the applicant shall have to enclose No Objection Certificate from State Government that there is no duplication of funding for the project and the applicant shall also submit self-declaration that he/she is not availing government subsidy / grant / assistance from any other ministry.

(This clause needs more clarity regarding the source of getting NOC from State Government/District Authorities. Self-declaration in form of legal affidavit may be more practical)

4. About the Project, Rationale, Management and Description

2.1. About the Project

1. Name of the Project	
2. Correspondence Address:	
3. Address of Project Site :	
4. Project Activity and Scheme components (Should be as per NHB scheme latest scheme guidelines- please verify):	

No.	Name of the scheme and component	Unit	Tick mark relevant component
5	Development of Commercial Horticulture through Production and Post-Harvest Management of Horticulture Crops		
	1. Open field condition (Litchi)		
	2. Integrated PHM (Litchi)		
	2.1. Pack House		
	2.2. Integrated Pack house		
	2.3. Pre-cooling unit		
	2.4. Cold Room (Staging)		
	2.5. Mobile Pre-cooling unit		
	2.6. Primary Processing		
	2.7. Refer Van		
	2.8. Retail outlet (environmentally controlled)		
	3. Add on components		

6. Details of Crop in case of Open field condition

Name of the Crops	Variety / Hybrid/ Cultivar	Area (acre/ha)	No. of plants	Source of Planting Material

7. Products, by-products and Services of the Project

8. Objectives of the Project

9. Expected Outcomes of the Project including Products / and Services of the Project

10. Socio-economic benefit to the region /District / State

3.2. Rationale / Justification for the project

3.2.1. Rationale

3.2.2. Details of similar projects / crop in the neighbourhood and the District -Area, Production, and Productivity briefly. Provide more details in Market viability chapter.

3.2.3. How quality of inputs/ raw materials is assured.

3.2.4. About Bank/ FI: Name of the Bank/FI, branch and its code identified for Term loan and Rationale

Name of Bank/ FI	
Bank/FI Branch Address	
Bank/FI Branch contact Number	
IFSC code	

3.3. Project Site/ Land details:

3.3.1. Proposed Project Area:

	Activity	Area proposed
1	Cultivation –	
	Open Cultivation (Ha)	
2	PHM	
3	Plant and Machinery	
4	Any other activity	

3.3.2. Land details- RoR/ Ownership / Registration of lease/ map etc.

	Name of Owner of land proposed for the project as per Land Revenue Records		
	Whether title of the land is clear in the name of applicant and is free from any litigation		
	How Title is derived	Ancestral	
		Purchased (with details of date)	
	Encumbrances if any		
	Name of the Owner in case of joint ownership	Survey/ Gat /khasra No etc.	Area in Sq.mt / Ha
			Share
	Whether land boundaries are demarcated for the applicant clearly.		Yes/No
	In case of Partnership		
	1. Whether land is owned by Partnership firm or jointly by its partners		Yes/No
	2. NOC: If land is owned by one of the partner, an undertaking by land owner is required stating that he/she will not withdraw, sale or transfer his/her land during currency period of the project		
	In case of Lease		
	1. In case the land is that of leased, Registration details of the said leased land in the office of Sub-Registrar		
	2. No.of Years of lease		
	3. Whether lease is entered in RoR		Yes/No
	Whether land is mortgaged? If yes provide details of mortgagor and mortgagee		

3.4. Location of the Project- Identification (Longitude, Latitude, Altitude, Village, GP, Block, District, State), Area, Number of growers.

1.	Location Address	
2.	a. Survey/Khasra/ Dag/ Other No	
3.	b. Habitation/ Village	
4.	c. Gram Panchayat / Urban body	
5.	d. Block / Urban body	
6.	e. Sub-Division	
7.	f. District	
8.	g. State /UT	
9.	Location Longitude, Latitude& Altitude	
10.	Total Area of land owned (ha)	
11.	Total Area proposed for project (ha)	

3.5. Current usage of land of proposed Project Area

Proposed Project			Current usage		
Survey / Dag etc. No	Nature of land Dry/ Irrigated/ Waste land	Area (ha)	Activity / Crop	Area (ha)	Mortgage Yes/No If Yes with whom

3.6. Current infrastructure and assets possessed by the Applicant:

Category	Asset Name	Year of Purchase	Make	Capacity	Cost
Fixed Assets	Tube well				
	Dug Well				
	Drip irrigation				
	Electric Motors				
	Tractor				
	Tiller				
	Transport vans				
	Vermicompost shed				
	Stores				
	Pack house				
	Labour room				
	Water harvesting pond				
	Installation/digging				
	Pipeline				
	Others				
Operating Assets	Planting Material				
	Support system				
	Tools and implements				

3.7. Lay out plan of the project: Map of Farm / production/ Operations unit / project land showing project details and land boundary details

3.8. Conversion of Land Use (CLU), if applicable

3.9. Whether project site is part of production belt / cluster / hub ? If yes, provide details of working relations with other farmers

3.10. Rationale for the choosing the said Location for implementation of the project /
Location advantages and disadvantages

3.11. Compliance of project site for food safety

(The information on soil condition and site on water logging, industrial waste and effluents. Run off and contaminated water is not allowed to enter fields.)

3.12. Components / Activities of the Project with justification (Please refer NHB scheme guidelines)

No.	Name of the scheme and component	Justification
1	Development of Commercial Horticulture through Production and Post-Harvest Management of Horticulture Crops	
	1. Open field for specified crops	
	2. Integrated PHM	
	2.1. Integrated Pack house	
	2.2. Pack House	
	2.3. Pre-cooling unit	
	2.4. Cold Room (Staging)	
	2.5. Mobile Pre-cooling unit	
	2.6. Primary Processing	
	2.7. Reefer Van	
	2.8. Retail outlet (environmentally controlled)	

Component wise cost of the Project and NHB Norms

Scheme Component	Items	Sub- items	Capacity/ Area/ spacing/ size Etc.	Units/ Numbers	Likely / unit cost	NHB Norm
Open field Cultivation	Cultivation Expenses	Planting material				
		Input cost (Labour, Manure & Fertilisers, pesticides etc.)				
		Others				
	Irrigation	Tube well/ bore well/ Open well (Nos.)				
		Cost of Pipeline from source of irrigation to production unit (Length, Size & Material)				
		Water harvesting structure / Water tank lined with minimum 300 microns				
		Non lined ponds/tanks				
		Others				
	Drip / Sprinkler					
	Civil Infrastructure	Functional pack house				
		Store & Pump house (Area in sq.ft with size)				
		Labour room & go down (Area in sq.ft with size)				
		Others				
	Farm Mechanisation (AC)	Tractor upto 20 BHP				
		Power Tiller	HP			
		Equipment's-driven by Tractor/ Power Tiller				
		Mulch laying machine				
		Self-propelled				

		Machinery				
		Other tools and equipment's as per Sub Mission on Agriculture Mechanisation (SMAM)				
		Others				
	Land Development	Soil levelling / Digging/Fencing etc.				
		Others if any				
	Land if newly purchased but not before one year from date of sanction of Term loan (indicate year)					
	Support system trellis for litchi					
	Vermi Compost Unit					
	1. Permanent Structure					
	2. HDPE Vermibed (12ft X 4ft X2 ft)					
	Certification of Good Agricultural Practices (GAP) including infrastructure (AC)					
	Plastic Mulching					
	Others					
	Grand Total					
Scheme			Capacity/ Area/ Spacing etc.	Units/ Number	Likely /Unit cost	NHB Norm
Integrated PHM	Integrated PHM					
	Pack House					
	Integrated Pack house					
	Pre-cooling unit					
	Cold Room (Staging)					
	Mobile Pre-cooling unit					
	Primary Processing					
	Retail outlet (environmentally controlled)					
		Others				

Note: NHB Norm: means Over all ceiling in project mode with add on component as per NHB Scheme guidelines. (Appendix 1-A)

AC: Add on component: Over and above the cost ceiling.

3.13. Operations Planning

1.	Name of Farm / Project Manager (working directly under the applicant / CEO) if any.-optional	
2.	Name of agency executing erection of Protected structure -and contact person Name and contact numbers	

3.	Name of agency providing technical know-how on turn key for cultivation and contact person Name and contact numbers	
4.	Operations:	
	1. Land preparation	Own / custom hiring
	2. Procuring planting material	Own / outsourcing
	3. Orchard planning	Own / outsourcing
	4. Water and nutrient management	Own / outsourcing
	5. Pruning & Training	Own / outsourcing
	6. Pollinators	Own / outsourcing
	7. Plant growth regulators	Own / outsourcing
	8. Integrated Pest & Disease management	Own / outsourcing
	9. Physiological disorders	Own / outsourcing
	10. Farm Mechanisation	Own / outsourcing
	11. Harvesting/ Fruit care management	Own / outsourcing
	12. Post-Harvest Management	Own / outsourcing
	a. Pre-cooling	Own / outsourcing
	b. Cleaning / Washing	Own / outsourcing
	c. Sorting and Grading	Own / outsourcing
	d. Packing and labelling	Own / outsourcing
	e. Transport	Own / outsourcing
	f. Storage- Low cost / Cold Room/ CA	Own / outsourcing
	g. Reefer van	Own / outsourcing
	h. Retail outlet	Own / outsourcing
	i. Cold chain	Own / outsourcing
	13. Marketing	Own / outsourcing
	14. Processing	Own / outsourcing

3.14. Month wise operational chart / Implementation schedule: Commencement to completion:

Project Implementation period in case of approval: Months.

Proposed/ Tentative dates of	Bench mark / Activity	Approximate date
Project Commencement		
First Commercial Crop / plantation / operations if any		
Project Completion		

Activity	Units	Months					
		JF	MA	MJ	JA	SO	ND
1. Land development							
2. Erection of Trellis							
3. Land preparation							
4. Procuring planting material							
5. Orchard planning							
6. Water and nutrient management							
7. Canopy management							
8. Pollinators							
9. Plant growth regulators							
10. Integrated Pest & Disease management							
11. Physiological disorders							
12. Farm Mechanisation-procurement							
13. Farm Mechanisation operations							
14. Harvesting/ Fruit care management							
15. Post-Harvest Management							
a) Pre-cooling							
b) Cleaning / Washing							
c) Sorting and Grading							
d) Packing and labelling							
e) Transport							
f) Storage- Low cost / cold storage/ CA							
g) Cold chain							
16. Marketing							
17. Value addition Processing							

Note: The month-wise activity is location specific. The table can be extended as per need. JF: January/ February; MA: March/April and similarly other abbreviations.

3.15. Backward and Forward linkages

1. Backward linkages -with growers, input suppliers etc.

Operations	Agency / Agents / providers	Remarks
Seed/ Planting Material		
Manure		
Fertilizers		
Bio fertilizers		
Bio pesticides		
Fertilizers		
Pesticides / Insecticide		
others		

2. Forward linkages- for Domestic and Export Market

Operations	Agency / Agents / Service providers	Remarks
Storage Unit		
Processing Unit		
Local Market		
Terminal market		
Farm Market		

3. Briefly explain as to how the produce will be consolidated (backward linkages) and marketed/exported (forward linkages)

3.16. Manpower (Skilled Labour, Expertise etc.), Required, Already available, Gaps and the management in a year.

3.16.1. Managerial and Technical

	Manpower	Managerial				Technical				Gap	
		Requirement		Availability		Requirement		Availability		S	US
		Number	No. of Days	Number	No. of Days	Number	No. of Days	Number	No. of Days		
	a)										
	b)										
	c)										

3.16.2. Skilled and Unskilled Labour

	Labour	Skilled Labour				Unskilled labour				Gap	
		Requirement		Availability		Requirement		Availability		S	US
		Number	No. of Days	Number	No. of Days	Number	No. of Days	Number	No. of Days		
	Operations/ activity										
	d) Administration										
	e) Manager										
	f) Finance & Accounts										
	g) Typing / IT operations										
	h) Watch man										
	Crop husbandry										
	a) Ploughing										
	b) Layout and pit digging										
	c) Planting										
	d) Training & Pruning										
	e) Spraying										
	f) Intercropping										
	g) Canopy management										
	h) Harvesting										

3.17. Employment Generation per annum (expected)

No. of man days / Annum	
Permanent man power -Permanent (on rolls)	
Casual / Temporary	

3.18. Infrastructure (Power, Fuel, Water, Plant and Machinery, Effluents treatment etc.)-
Required, Already available, Gaps and the management.

Utility	Requirement	Remarks
Power	Likely requirement per month for the purposes of irrigation/packhouse etc	
	Source of Power	
	Access to Power is assured or not	
	Alternative Source of Power in case of breakdowns	
Water	Source – Ground Water /Surface Water	
	Existing or New source	
Plant & Machinery		
Fuel	Access to fuel to power- Generators- Yes/No	
	Nearest fuel depot	
Effluent treatment	Facility and method adopted for effluent treatment (If sewage water is used in production system)	
Road connectivity	Distance from the State Highway and National Highway.	
Rail connectivity		
Air connectivity		
Market connectivity		
Vermi compost	If available Numbers and Capacity. Types:1. Permanent Structure and 2, HDPE Vermi bed (12ft X 4ft X2 ft)	
Animal Husbandry	Details of Animals Capacity / Income	
Environmental issues of the project if any		
Fencing		
Any other		

3.19. SWOT Analysis

1	Strengths	
2	Weaknesses	
3	Opportunities	
4	Threats	

3.20. **Monitoring and evaluation of Project:** (Select the appropriate institution for consultancy)

ICAR-National Research Centre on Litchi, Muzaffarpur, Bihar

ICAR-RCER, Ranchi centre, Jharkhand

GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand

PAU, Ludhiana, Punjab

BAU, Sabour, Bihar

Dr. Y. S. Parmar UHF, Solan, Himachal Pradesh

Attention of the applicant:

1. Applicant has to intimate the Board before effecting change of project land, crop, area, bank etc in the proposal before claim of subsidy. (page 121 of guidelines point 10(vi). Thus Any change in crop or project site without prior approval of NHB shall make the component or project, as the case may be, ineligible for getting subsidy.
2. Even the change in FI / Banker should be done with prior approval of NHB.

**(Signature of the Applicant)
with date and time.**

4	NHB Scheme under which the project is proposed with rationale / justification.	
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1. Scheme.1: (Mention Scheme details)

2. Cost Norms and pattern of assistance: (Mention scheme guidelines)

3. Rationale for justification for taking up the proposed project under the scheme No.1 and its components.

5.Project details

5.1	Agro-climatic suitability	
-----	---------------------------	--

5.1.1. Origin, History, and Distribution

1. Origin of the crop and its introduction into India:

Litchi has its origin in southern China and northern Vietnam where it is believed to have been cultivated for thousands of years. Its cultivation spread from China to the rest of the world and commercial orchards are present in sub-tropical regions. China is the largest producer of litchi in the world followed by India, the two countries accounting for almost 91% of world production. Other major countries where the fruit is grown include Taiwan, Thailand, Vietnam, South Africa, Madagascar, Indonesia, Israel, and Australia. Litchi was introduced to Thailand from China about 300 years ago. Chinese migrants and merchants have also been instrumental in the distribution of litchi. Important routes in this spread include Australia, Mauritius, India, Madagascar, Florida, Hawaii, South Africa etc. The spread of commercial production has accelerated over the last few decades because of increasing interest in exotic fruits in Europe and up-markets.

2. Distribution of crop across the country

Litchi trees are believed to have introduced into India in 1798 from Thailand. Since then, the fruit has spread throughout the country especially in the sub-tropical belt along the foothills of the Himalayas. Much of the litchi-growing regions are concentrated along the Indo-Gangetic plains, and organised orcharding has shown substantial growth in the last 50 years. Bihar continues to dominate in terms of area and production of litchi in India. Other states include West Bengal, Uttar Pradesh, Tripura, Uttarakhand, Jharkhand, Punjab, Himachal Pradesh, Assam, Nagaland, Mizoram etc. In recent years, litchi cultivation is picking up in hilly tracts of Southern India in the states of Kerala, Tamil Nadu, and Karnataka.

5.1.2. Agro-climatic / Horticultural zones including Rainfall, temperatures at critical stages and suitability of the project *(Not applicable to standalone PHM projects)*

Parameter	Recommended@	Project location parameters#	Remarks / deviations
Climate	Sub-tropical		
Altitude	Up to 1000 m		
Climateric / Non Climateric	Non-climacteric		
Thermosensitivity of crop	Litchi flowers best with day temperature of 20°C. Flowering occurs profusely when temperature falls below <10°C for atleast 250 hours. Temperature below -2°C for sufficiently longer duration can kill trees. Temperature above 40°C during crop maturity period is detrimental to fruits		
Photosensitive	Not applicable		
Temperature range	0-42°C		
1. Mean monthly / Average temperature for growth and fruiting	20-35°C		
2. Av.Max.temperature	40°C		
3. Av.night temperature	15-25°C		
4. During fruiting phase	25-36°C		
a. Flowering	19-22°C		
b. Fruiting	30°C		
c. Maturity	25-36°C		
Rainfall / Water resources	900-2500 mm		
1. Land preparation	Summer months; needs less water / rain		
2. Flowering	Spring ; needs no water		
3. Fruiting	Spring/Summer ; needs assured irrigation		

4. Maturity	Summer; Assured irrigation		
Humidity	Humid summer and dry cool winter		
1. Vegetative growth	80-90%		
2. Shoot/Flush maturity	55-60%		
3. Flowering	70-75%		
4. Fruiting	70-73%		
5. Maturity	40-50%		
6. Season	Summer/Winter		
Winds during crop season	8-20 km/h		
1. Wind velocity	Mild		
2. Wind direction	Westerly winds during fruit development and maturity. Easterly winds during fruiting results in more attack of pests		
Fruit quality attributes	17-21°B TSS and 0.3-0.5% acidity, with bright red colour of fruit and fragrant aroma at harvest, more than 33 mm fruit diameter		
Harvesting Season	April-July (North and Central India) December-January (in South India)		

@ Note: Recommendations of ICAR-National Research Centre on Litchi, Muzaffarpur, Bihar

Provide source (could be IMD/Agric.Univ/State Govt.) and weblink if possible

Risk management/ Deviation Management if any:

Conclusion: Whether project crop is recommended for the project location	Yes/No
---	---------------

5.1.3. Soil type-composition required and that of project suitability

(Not applicable to standalone PHM projects)

	As recommended ICAR-NRC on Litchi, Muzaffarpur, Bihar	Project location data as per latest Soil health test	Deviation if any and Management	Date on which soil health is tested and the name of the Institute
Soil type	Fertile alluvial/red lateritic soil			
Texture	Sandy loam, clay loam			
pH	5.5-8.5			
Organic carbon	0.5-2%			
Electrical conductivity	< 0.2 dSm ⁻¹			
Chlorine	< 250 mg kg ⁻¹			
Sodium	low			
Potassium	0.5-1.0 meq 100g ⁻¹			
Nitrogen	> 10 mg/kg			
Phosphorus	> 15 kg/ha			

@ Recommendations of ICAR-National Research Centre on Litchi, Muzaffarpur, Bihar

#: Provide details of Soil Test Laboratory (should be that of Agriculture Dept/ Agric.Univ/ Central or State Government) where Soil is tested with contact details of Head of Laboratory/ Analyst with telephone and mobile details and weblink if possible. A self-attested copy of the laboratory results should be submitted in case project is qualified for processing for subsidy claim.

Whether project location is a problematic soil-Alkalinity/Salinity/Others: if Yes.

1. Causes
2. Reclamation / Management/ Amendments proposed:

Conclusion: Whether project location soil is suitable for the crop / activity.	
--	--

5.1.4. Water/ Irrigation water Quality -requirements and that of project suitability

(Not applicable to standalone PHM projects)

	As recommended ICAR-NRC on Litchi, Muzaffarpur, Bihar@	Project location data as per latest Water Analysis test#
pH	6.5-7.5	
EC	Normal	
Total salt concentration,	Low	
Sodium Absorption Ratio (SAR)	Low to medium	
Bi-Carbonate	Nil	
Boron concentration	Medium	
Heavy metals	Nil	
Pesticide residue	Nil	

@ Recommendations of ICAR-National Research Centre on Litchi, Muzaffarpur, Bihar

#: Provide details of Laboratory (should be that of Agriculture Dept/ Agric.Univ/ Central or State Government) where water is tested with contact details of Head of Laboratory/ Analyst with telephone and mobile details. A self-attested copy of the laboratory results should be submitted in case project is qualified for processing for subsidy claim.

Conclusion: Whether project location water source is suitable for the crop / activity.	Yes / No
--	----------

5.2. Project- Market viability of the Project

5.2.1.Commercial (and nutritive -where ever applicable) importance / significance, composition and uses.

Litchi fruits are juicy and delicious, and are a summer delight. Litchi is an excellent source of vitamin C providing about 71.5 mg/100g (USDA, 2013), thereby the recommended dietary allowances of 40 mg/day for Indians can be easily met by consuming a few litchi fruits. The consumption of a single litchi fruit would meet 2-4% of the daily dietary requirements for P, K, Mg, Fe, Zn, and Mn, and about 22% of Cu. Litchi is high in carbohydrates and is therefore a good source of energy. There is already a large body of evidence associating intake of dietary antioxidants, such as vitamin C, to reduced risk of chronic diseases. Litchi also contains good amounts of potassium, copper, dietary fiber, vitamins, antioxidants, and polyphenols. Research suggests that oligonol, a low molecular weight polyphenol from litchi fruit, possesses anti-influenza effects, and weight reduction and beneficial effects in preventing obesity-induced metabolic syndrome. Litchi is believed to relief coughing and decoctions of the root, bark and flowers are gargled to alleviate ailments of the throat.

5.2.2.Targetted market (s) : (Domestic or International): In case of International market, the applicant have to refer APEDA export requirements and should specify compliance appropriately with in the document. In case of domestic market, specify the intended market briefly while more details be provided in Marketing chapter.

5.2.3.Statistics: India and State.

1. India: Area, Production and Productivity in the area, State and India for the last 5-10 years
National picture

Year	Area in ha	Production MT	Productivity T/ha	Global Productivity data T/Ha
2008-09	72000	423000	5.9	India has highest productivity among litchi growing countries
2009-10	74400	483000	6.5	
2010-11	78000	497000	6.4	
2011-12	80400	538100	6.7	
2012-13	82700	580100	7.0	
2013-14	84200	585300	7.0	
2014-15	85000	528300	6.2	
2015-16	90100	558800	6.2	
2016-17	92100	583400	6.3	

Source: NHB Database and Horticultural Statistics at a Glance

2. State wise picture- Top 10 producing states

State	Area in ha	Production MT	Productivity T/ha
Bihar	32000	198000	6.18
West Bengal	9400	76800	8.17
Assam	5500	48700	8.85
Punjab	2000	32100	16.05
Jharkhand	5400	58800	10.88
Uttarakhand	9700	19500	2.01
Chhattisgarh	5600	39200	7.0
Tripura	3900	20600	5.28
Orissa	4500	20300	4.51

Source: NHB database, 2015

3. Project State Picture (Mandatory)

Year	Area in ha	Production MT	States' contribution to Nation	Productivity T/ha	Gap in Productivity (T/Ha)		
					State Av.	National Av	Global Highest

Source:

4. Project State-district wise performance in the said crop producing districts in Last Year (Mandatory)

Area			Production			Productivity		
District	Area (ha)	% of State Area	District	Production (MT)	% of State Production	District	Productivity (T/ha)	Ranking

Source:

5. Project crop in the state: Trend of Area, Production and Productivity (Mandatory)

District	Item	Current Year	CY-2	CY-3	CY-4
District.1	Area				
	Production				
	Productivity				
District.2					

Source:

6. Share of project Crop- in terms of Area and Production in overall fruits/vegetables.

Crop	Area		Production		
	Ha	%	MT	%	
Total		100		100	

Source:

7. Availability of Storage facilities in the project area / District / State Source: (Desirable Data)

Year	Commodity	Low cost storage structures			Cold storage			CA Storage		
		No.	Capacity	Capacity utilisation	No.	Capacity	Capacity utilisation	No.	Capacity	Capacity utilisation

8. Requirement of storage facilities in project area/District/State (Source, desirable data)

Year	Commodity / produce	Storage required in the area	Storage available in the area	Gap	Remarks

8.2.4. Clusters/ Zones

5.2.4.1. Crop clusters in the State (Mandatory)

Cluster	District	No. of villages	No. of farmers	Total Area
1				
2				
3				
4				

5.2.4.2. Crop Agricultural Economic Zones in the State / UT, if any (Desirable)

Cluster	District	No. of villages	No. of farmers	Total Area
1				
2				
3				
4				

5.2.5.1. Demand for the commodity:(based on the available data- minimum for the project area, district and the state)

Demand -Supply gap for the commodity

Unit	Demand	No. of growers		Supply / production	Gap	Remarks
		Nos.	Area			
Project area						
District where project is located						
State						
Country						
Globally						

Note: Applicant may take the help of District Horticulture Officer.

5.2.5.1. Projections of production, productivity, targets for domestic and export market (Desirable)

Year	Production	Productivity	Local Market		Terminal market		Export Market	
			Quantity	Value in Rs.	Quantity	Value in Rs.	Quantity	Value in Rs.

5.2.6. Global producers- Country, Area, Production, Productivity and global market share for the last 5-10 years

Major producing country	Production (MT)
China	2000000
India	583400
Thailand	220000
Taiwan	150000
Vietnam	50000
South Africa	15000

5.2.7. International trade market and potential:


Country	2015-16		2016-17	
	Quantity (MT)	Rupees (Lakh)	Quantity	Rupees (Lakh)
UAE	0.03	0.02	20.37	52.68
Nepal	9.4	3.84	53.96	30.77
Thailand	0	0	50	20.93
France	0	0	0.46	1.2
Kuwait	0.12	0.3	0.33	0.46
Canada	0	0	0.2	0.18
Qatar	0	0	0.05	0.06
Bangladesh	0	0	0	0
United Kingdom	0	0	0	0
Bahrain	0.2	0.16	0	0
Others	0.12	0.05	0	0
Total	9.87	4.37	125.37	106.28


Source: Horticultural Statistics at a Glance 2017, Horticultural Statistics Division, DACFW, Ministry of A&FW, Govt. of India

5.2.8. Seasonality matrix of the fruit (Desirable Data):

Seasonality matrix of the crop with reference to other fruits / vegetables

Crop	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Litchi												
Mango												
Guava												
Banana												
Citrus												
Grapes												
Sapota												

 Lean Season

 Peak Season

Demand and Supply issues specific to project area

5.2.9 Price variation of litchi in project State / UT or at a Major Fruit & Vegetables Market

	Local Market: 1 Unit=Rs. Per Qtl/MT/Kg											
Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2011												
2012												
2013												
2014												
2015												
2016												
2017												

Year	Major Terminal Market: Rs/kg (Wholesale price)											
2014	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Amritsar	-	-	-	-	-	47	-	-	-	-	-	-
Bhubaneswar	-	-	-	-	105	97	-	-	-	-	-	-
Chandigarh	-	-	-	-	47	50	52	-	-	-	-	-
Dehradun	-	-	-	-	-	50	69	-	-	-	-	-
Delhi	-	-	-	-	86	75	78	-	-	-	-	-
Guwahati	-	-	-	-	32	51	-	-	-	-	-	-
Jaipur	-	-	-	-	76	63	-	-	-	-	-	-
Jammu	-	-	-	-	-	80	64	60	-	-	-	-
Kolkata	-	-	-	-	55	45	-	-	-	-	-	-
Lucknow	-	-	-	-	58	46	-	-	-	-	-	-
Patna	-	-	-	-	34	42	-	-	-	-	-	-
Raipur	-	-	-	-	84	79	-	-	-	-	-	-

Projected prices of project produce

	Market: Mention local or terminal market; Unit=Rs. Per Qtl/MT/Kg											
Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

5.2.10. Balance sheet of commodity in the State (Desirable Data/ Voluntary)

	Year: Qty: 000Tons											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Stored/ Carry in												
Fresh Production/ Arrivals												
Imports												
Availability												
In LT Storage												
Consumption												
Exports												
Post Production losses												
Total Usage												
Carry out												

Source:

Note:

5.2.11. Whether transportation infrastructure is available.

1. Mode of transportation / arrangement:
2. Whether cold chain facility available locally if so details of service providers and contact person name.

5.2.12. Value Addition scope/ potential

Litchi has tremendous scope for value addition through processing. ICAR-NRC on Litchi has developed processing protocols for various processed products of litchi such as litchi pulp, litchi beverages, dehydrated litchi pulp, litchi nut, litchi wine etc. Such processed products not only increase the product mix but also increases the duration of availability of the crop and reduces postharvest losses.

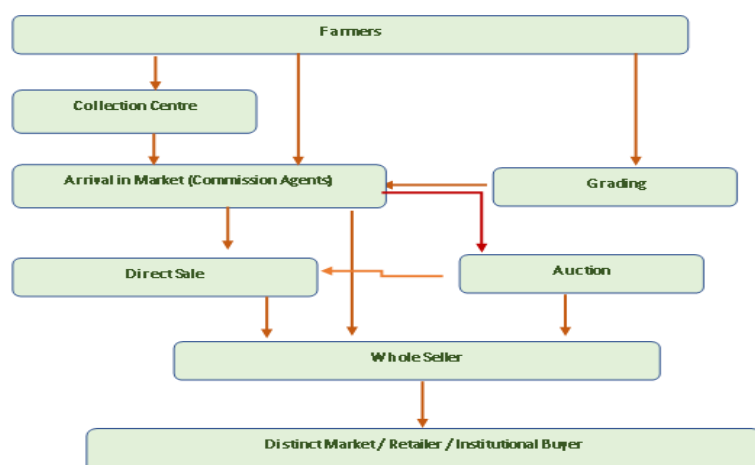
5.2.13. Central and State Government policies to promote litchi:

(Towards its promotion, area expansion and organised marketing, processing and export).

The applicant should mention about the government initiatives like establishment of litchi export zone, special fruit belt for litchi, schemes to promote litchi, infrastructures developed for litchi crop in detail.

5.2.14. Value chain in litchi

Ideal value chain



Existing value chain: The applicant should reflect the existing value chain and marketing channels of litchi in project area or state

5.2.15. Proposed Business Strategy by the Applicant for Marketing and Market viability

5.3.Financial Viability of the Project:

5.3.1: Due Diligence Status

	Date of Pre-Sanction / Due Diligence		Remarks
1	Examination of CIBIL report	Yes/No	
2	Credit rating / scoring is done	Yes/No	
3	Whether name of promoters/company appearing in the list of- a) RBI defaulter list b) RBI willfull defaulter list c) ECGC SA list	Yes/No Yes/No Yes/No	
4	a)Verification of CERSAI (Central Registry of Securitisation Asset Reconstruction and Security Interest) b) In case of company whether financial data verified with ROC .	Yes/No Yes/No	

5.3.2.Project Cost (Rs in Lakhs) – (subitems are to be decided based on need)

Scheme Component	Items	Sub- items	Capacity/ Area/ spacing Etc.	Units/ Numbers	unit cost	Cost
Open field Cultivation (Litchi)	Cultivation Expenses	Planting material				
		Input cost (Labour, Manure & Fertilisers, pesticides etc.)				
		Others				
	Irrigation	Tube well/ bore well/ Open well (Nos.)				
		Cost of Pipeline (Length, Size & Material)				
		Water harvesting structure / Water tank min. 300 microns				
		Non lined ponds/tanks				
		Others				
	Drip / Sprinkler					
	Civil Infrastructure	Functional pack house				
		Store & Pump house (Area in sq.ft with size)				
		Labour room & go				

		down (Area in Sq.ft with size)				
		Others				
	Farm Mechanisation (AC)	Tractor upto 20 BHP				
		Power Tiller	HP			
		Equipments-driven by Tractor/ Power Tiller				
		Mulch laying machine				
		Self-propelled hort. Machinery				
		Other tools and equipment's as per Sub Mission on Agriculture Mechanisation (SMAM)				
		Others				
	Land Development	Soil levelling / Digging/Fencing etc.				
		Others if any				
	Land if newly purchased but not before one year from date of sanction of loan (indicate year)					
	Support system for Grapes					
	Vermi Compost Unit					
	Certification of Good Agri Practices Good Agricultural Practices (GAP) including infrastructure (AC)					
	Plastic Mulching					
	Others					
	Grand Total					
Scheme			Capacity/ Area/ Spacing etc.	Units/ Number	Likely /Unit cost	NHB Norm
Integrated PHM (Litchi)	Integrated PHM					
	Pack House					
	Integrated Pack house					
	Pre-cooling unit					
	Cold Room (Staging)					
	Mobile Pre-cooling unit					
	Primary Processing					
	Retail outlet (environmentally controlled)					
	Others					

Summary of Project Cost

Project items	Components	Project Cost	Max. possible NHB support (self-appraisal)
1. Open field condition	With add on components		
	Without add on components		
3. Integrated PHM			
2.1. Integrated Pack House			
2.2. Pack house			
2.3. Pre-cooling unit			
2.4. Cold Room (Staging)			
2.5. Mobile Pre-cooling unit			
2.6. Primary Processing			
2.7. Refer Van			
2.8. Retail outlet			
Grand Total			

5.3.3. Means of Finance (Rs.in Lakhs)

S.No	Item	Components			
1	Promoters share				
2	Bank/FI Term loan				
3	Un secured loan/VCA				
	Total				

5.3.3. Information on subsidy available under different schemes:- (For information)

1.	Subsidy from NHB				
2.	Subsidy from State	*			
3.	Subsidy from Centre	*			
4.	Subsidy from other sources	*			
	Total				

5.3.4. Investment in Horticulture Sector

5.3.5. Key financials of the proposed / existing Project : (Rs. In Lakhs)

FINANCIAL INDICATORS	Estimated projections							
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8
Capital								
Reserves								
Intangibles								
Tangible Net Worth								
Net Working Capital								
Current Ratio								
Net Sales								
Op. Profit								
Net Profit Before Tax								
Net Profit After Tax								
TOL/ TNW								
Debt-equity ratio								
Depreciation								
Dividend								
Retained Profit								

Justification for the above (wherever figures are on higher side)

NOTE: In case of existing business / project, the promoter has to provide the audited data for the last three years apart from estimated and projected data for covering the entire repayment period.

5.3.6 Project Financing:

- 1) Rate of Interest :
- 2) Percentage of Term loan against total project cost
- 3) Internal Rate of Return (IRR):
- 4) Cost of Production and Profitability (Annexure)
- 5) Yield and Sales Chart (Annexure)
- 6) Proposed Balance Sheet: (Annexure)
- 7) Proposed Cash flow Statement for repayment period (Annexure)
- 8) Proposed Profit & Loss Account: (Annexure)
- 9) Proposed Repayment of Term loan and Schedule (Annexure)
- 10) Break even Analysis (Annexure)
- 11) NPV (Net Present Value)
- 12) Economic Rate of Return
- 13) Depreciation

5.3.13. Sensitivity analysis of the project.

Base Case	2018-19 (First Full Year of Operation)				
Case I	Decrease in capacity utilization by 10%.				
Case II	Decrease in Sales by 10%.				
Case III	Increase in Raw Material Cost by 10%				
	Base Case	Case I	Case II	Case III	
PBIDT					
PBT					
PAT					
Min DSCR					
Max DSCR					
Overall DSCR					

5.3.14. Key Financial Parameters for the proposal:

Sl. No.	Ratio	Benchmark	As calculated by Project Finance Expert				
			1 st yr	2 nd yr	3 rd yr	4 th yr	5 th Yr
1.	Current Ratio other than export units	1.25:1					
2.	CR-Export units	1.10:1					
3	IRR /BCR						
4	DSCR*	1.50:1					
5	Average DSCR						
6	Debt to Equity Ratio i.e DER	3:1					
7	TOL/TNW	4:1					
8	Promoters Contribution	25% minimum					
9	Break Even Point	Lower the % is better					
10	Security Coverage Ratio	More than 100% of Loan Amount					
11	Repayment period	Up to 7 Years excluding moratorium, but not to exceed an overall tenor of 10 years					

5.3.15. Statement of Assets & liability as on.....

1. Immovable Assets

(Rs. In lakh)

Sl.No	Description	Extent	Location	Face value	Market value
1	Land				
2	Building				
3	Plant & machinery				
4	Commercial plots				

2. Movable Assets

Sl.No	Description	Modle	Face value	Market value
1	Car/Scooter/Truck/Bus/Mobile phone			

3. Bank/FI balances and cash

Sl.No.	Name of the institutions	Date of opening	Face value	Market value/Present value

4. Shares & debentures

Sl No	Name of the Company/Institutions	Date of purchase	Face value	Market value

5. Investment in business & other associates concern

Sl No	Name of the Company/Institutions	Date of Investment	Face value	Market value

Total assets.....

1. Liabilities

Sl.No.	Nature of the loan	Name of the institution	Date of loan	Face value	Market value/Present value

Total liabilities.....

Net of assets & liabilities.....

Date: Signature of the Promoter/Guarantors/Directors /partner

Risk Analysis& Management

- A. Promoters & Management Risks:
- B. Project Completion and Operational Risk:
- C. Other Risks:

Risk	Recommendation	Proposed management
Excess production / Glut situation in Market	There should be unit for pulping/value addition/storage	
Crop failure	Crop insurance	
Price volatility-low prices	Storage facility to stabilize price	
Pests and Diseases	Standard protocols should be followed	
Natural calamities- fire, cyclone, Floods etc.	Insurance	

Farm record keeping/ Maintenance proposed

5.4: Land development and Crop husbandry

5.4.1. Land development: (in case of waste/ barren land)

The bushes should be removed. Field should be deep-ploughed and levelled. The gradient should not be more than 3-5%. Under sloppy lands, contour system should be followed. Pits of size 1m x 1m x 1m should be prepared in summer, followed by filling with good substrate. If necessary, pit soil should be replaced with good soil.

(For details, recent publications of ICAR-NRCL should be referred)

5.4.2. Selection of Quality Planting Material

(Recommended and popular Cultivars- varieties/hybrids, their specific characteristics, requirements and yields and list of reputed / accredited Nurseries)

1. Recommended and popular cultivars/ varieties/ Hybrids State wise	Name of variety / Hybrids/ cultivar (with potential yield)
a. Bihar	Shahi, China, Purbi, Rose Scented, Gandaki Lalima, Mandraji, Gandaki Sampada, Early Bedana
b. Uttar Pradesh & Uttarakhand	Gandaki Sampada, Early Large Red, Early Bedana, Late Large Red, Late Bedana, Shahi, Rose Scented, Calcuttia, China, Gulabi
c. West Bengal	Bombai, Ellaichi, Early Ellaichi, China, Deshi, Purbi, Gandaki Lalima, Shahi
d. Punjab and Haryana	Dehradun, Shahi, Gandaki Sampada, Early Seedless, Rose Scented, Early Large Red, Late Large Red, Calcuttia
2. Classification of cultivars based on crop maturity	
a. Early	Shahi, Rose Scented, Deshi, Dehradun, Ajhauri, Green, Dehra Rose
b. Mid	China, Purbi, Culcuttia, Bombai, Bedana, Gandaki Sampada, Gandaki Lalima, Sabour Bedana, Sabour Mathu, Trikolia
c. Late	Gandaki Yogita, Kaselia, Longia
3. Classification of cultivars / Varieties/ Hybrids based on purpose	
a. Table purpose	Shahi, Bedana, Gandaki Sampada, Gandaki Yogita, China
b. Processing for beverages	Shahi
c. Processing for canning	China

Cultivar/Hybrid/Variety / Planting material Selected:

Cultivar/Hybrid/Variety / Planting material	Parentage	Area	Medium/ High/ Ultra High density	Requirement Quantity

Method of Propagation / technology:

Method recommended by ICAR-NRCL	Air-layering
Proposed method under the project	
Do's and Don't's proposed / taken in propagation	<ul style="list-style-type: none"> ○ Select healthy scion for propagation ○ Maintain good health of plant in nursery ○ Ensure proper root development in the saplings
Expert guiding the project	

List of Nurseries having Virus Indexing:

List of NHB accredited Nurseries: Availability of quality seeds / planting material.

List of reputed / authorised store / Nursery from where quality seeds / planting material is planned to source in the project:

Planting material-source, quality and suitability

1. Proposed cultivar / variety/Hybrid	
2. Criterion / Rationale for Selection	
3. Nursery / Shop from where seeds/ planting material is procured/ purchased	Name of Nursery/ Shop: Proprietor Name Contact Number:
4. Whether variety/ hybrid/ cultivar registered under Section 39 (2) of The Protection of Plant Variety and Farmers Right Act, 2001 (PPVFR Act)	
5. Authority which provides compensation to the farmers in case a registered variety does not perform as per the claim made by the breeders.	Registrar General, PPV & FRA is the designated officer for redressal of Public Grievances and can be addressed to: Registrar General Protection of Plant Varieties and Farmers' Right Authority S-2, A Block, NASC Complex, Opp. Todapur Village New Delhi -110012
6. Applicability of Seed Act and any State Act on nursery/ planting material	
7. Authority which provides compensation to the farmers in case a registered variety does not perform as per the claim made by the breeders under Seed Act / State Nursery Act if any	
8. Parentage if known	
9. Original manufacturer / Source of planting material	
10. Name of Tests with date and lab-conducted to assure pest and disease free ness of seeds/ propagation by the nursery	
11. Whether the planting material is imported. If Yes, whether plant quarantine and disease free certification was done	

5.4.3.	Orchard planning, Layout and management	
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5.4.3.1.Planning of orchards establishment and layout systems / Types of orchards-

Square, rectangular, Y-shaped trellis, and High density planting can be adopted

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none"> ○ The Litchi, FAO Publication, New Delhi, 2012 ○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi ○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

5.4.3.2. Land preparation including pit preparation

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none">○ The Litchi, FAO Publication, New Delhi, 2012○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

5.4.3.3. Planting Season / time and density

Items	Recommended @	Proposed	Remarks in case of deviation
Planting Season / Time	Monsoon season		
Spacing	8m × 8 m, 8 m × 6 m, 8m × 4m, 6 m × 6 m		
Plant density per Acre	As per spacing selected		
Planting Material treatment	Hardening of plants before planting		
Depth of planting	Earth-ball should be properly placed in prepared pit at 20-30 cm from collar portion		
Transplanting age	1-2 years		

@: Recommended by ICAR-NRC on Litchi, Muzaffarpur

5.4.3.4. Water and Nutrient Management

1. Water requirements, Source and irrigation methods

a. Water source, demand and availability

Water Source	Water Quality	Water Availability	Last Year consumption	Current Year demand
Tubewell				
Canal				
Open well				
Pond				
Others				

b. Critical stages for Irrigation and water required under Drip Irrigation(Please refer the mentioned publications for details)

Critical stages	Proposed action
Vegetative flushing	
Fruit set	
Fruit development	

c. Method of Irrigation: Surface (flood irrigation and drip irrigation)

d. Water harvesting measures : *In situ* water harvesting, Moisture conservation by mulching

2. **Nutrient management**—FYM 50-60 kg, oil cake 2.5-3 kg urea 2 kg SSP- 3.5-4 kg MOP- 1-1.5 kg per plant. But actual dose will vary as per soil test report of the orchard

Date of test		Institute of testing	
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Soil Health Parameters	Recommended range	Proposed site	Remarks
Soil type	Alluvial sandy loam, clay loam soil		
Texture	Sandy loam		
pH	5.5-8.5		
Organic carbon	1-3%		
Electrical conductivity	< 0.2 dSm ⁻¹		
Potassium	0.5-1.0 meq 100g ⁻¹		
Nitrogen	> 10 mg/kg		
Phosphorus	> 15 kg/ha		
Chlorine	< 250 mg kg ⁻¹		

As recommended ICAR-NRCL	The publications mentioned here are notable reference books on litchi cultivation. o The Litchi, FAO Publication, New Delhi, 2012
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	<ul style="list-style-type: none"> ○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi ○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

Availability of Water and Nutrient management plan: Yes/ No

For problematic soils, test of water quality is required

5.4.3.5. Intercultural operations including weed management

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none">○ The Litchi, FAO Publication, New Delhi, 2012○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

5.4.3.6. Plant canopy architecture management/ training and pruning

Litchi plants are pruned every year immediately after harvest i.e. June-July. The conical top portion (central leader) of the tree is to be removed to open central portion for penetration of sun light from the middle by canopy management. The fruit bunches to be harvested along with 20-25 cm twigs and foliage.

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none">○ The Litchi, FAO Publication, New Delhi, 2012○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

5.4.3.7. Use of Pollinators

In litchi, pollinators are essential for enhancing pollination and thereby increasing yield. It also provides supplementary income to farmers in terms of honey and wax.

Item	Recommended	Proposed	Remarks
No. of bee hives	15-20 per hectare		

5.4.3.8. Use of Plant growth regulators (including waiting period)

Plant growth regulators are used in litchi production system for different purposes. NAA @ 20-25 ppm and GA₃ @ 100-150 ppm are effective in reducing the incidence of flower and fruit drop, and fruit cracking. IBA @ 1-2 g/L is applied for promoting rooting in air-layers of litchi. Irregular bearing is a problem in certain cultivars of litchi especially cv. China. Girdling of primary branches by removal of 3-4 mm circular width during last week of August to 2nd week of September and application of paclobutrazol @ 2g a.i. per metre of canopy diameter is effective in inducing regular flowering and fruiting. Foliar application of ethe-rel @ 400 ppm or KNO₃ @ 1% at monthly interval from October-December induces panicle emergence, flowering and fruiting in litchi.

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none">○ The Litchi, FAO Publication, New Delhi, 2012○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

5.4.3.9. Flowering & Fruiting

(Including Problem of unfruitfulness / Growth, fruiting habits and methods for inducing fruitfulness)

Litchi has a tendency of regular bearing. However, few cultivars especially cv. China shows erratic trend. In order to achieve flowering and fruiting year after year, girdling of primary branches is done by removing a ring of bark 3-4 mm wide in last week of August to 2nd week of September.

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none">○ The Litchi, FAO Publication, New Delhi, 2012○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

5.4.3.10. Integrated Pest and Diseases Management including Biological control and Food Safety

Litchi is infested by number of insect pests such as litchi fruit and shoot borer, litchi mite, bark eating caterpillar, litchi leaf roller, semi-looper, red and ash weevil, litchi bugs etc. Among these, management of three major pests are essential to ensure good crop and harvest, which are mentioned below.

Litchi fruit and shoot borer

Litchi fruit and shoot borer is the most important insect pest in litchi ecosystem, and causes widespread economic losses. Litchi fruit borer population can be kept at bay by adopting an integrated pest management schedule.

- A prophylactic spray of neem-based formulation (4ml/l) when new flush emerges during September-October
- Preventive spray of neem oil (4ml/l) before flowering
- Integrated management schedule includes two sprays of systemic insecticide viz. thiacloprid or imidacloprid @ 0.5 – 0.7 ml/l during September at 15 days interval.
- This should be followed by spray of Novaluron 10 EC @ 1.5 ml/l when fruit attains clove size, cypermethrin 25 EC @ 0.5 ml/l 25-30 days after fruit set, and another spray of novaluron 10 EC @ 1.5 ml/l about 10 days before expected harvest.

Bark-eating caterpillar

Bark-eating caterpillar is another major pest of litchi in almost all litchi-growing regions in India.

- Kill caterpillars by inserting iron spoke into tunnels.
- Remove the insect gallery from tree trunk and inject kerosene oil/petrol/ chloropyrifos (0.05%) into the hole
- The attacked trunk and branches can be sprayed with 0.05% Thiacloprid.

Litchi mite

Mite can be another major pest in litchi orchards.

- Maintain field sanitation and remove infested shoots, leaves and plant parts
- Pruning litchi plants after harvest should be done.
- This should be followed by two sprays of chlorfenapyr 10 EC (3ml/l) or propargite 57 EC (3 ml/l) at 15 days interval during July.

Diseases and Management

Fungal diseases are more common in litchi and common fungi include *Alternaria alternata*, *Colletotrichum gleosporioides*, *Aspergillus* sp., *Fusarium solani*, and *Botryodiplodia* sp.

- Application of biocontrol agents such as *Trichoderma herzianum* helps recover the plants.
- *Alternaria alternata* can be controlled by fungicidal spray of copper oxychloride (0.25%), difenconazole (0.05%), or carbendazim (0.1%).

Anthraxnose and fruit rots can be reduced with pre-harvest spray of carbendazim (0.1%) 15-20 days before anticipated harvest

As recommended by ICAR-NRCL	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none"> ○ The Litchi, FAO Publication, New Delhi, 2012 ○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi ○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>
Action taken / proposed by the applicant	
Points of Deviation if any and justification	

Residue Analysis: Address and contact details of NABL approved laboratory proposed for testing pesticide residue:

5.4.3.11. Special problems if any

Special Problem	Recommendation by ICAR/ CAU/SAU/SHU	Proposal / action taken by applicant	Points of deviation and justification
Flower and fruit drop	<ul style="list-style-type: none"> ○ Increase honey bee colonies ○ NAA @ 20-25, ppm GA3 @ 100-150 ppm, or 2,4-D @ 10-20 ppm before flower opening ○ two sprays of planofix @ 4 ml/10 l water at 15 days interval from clove size stage controls fruit drop 		
Fruit cracking	<ul style="list-style-type: none"> ○ Maintain adequate soil moisture ○ Calcium @ 2g/L, Boric acid @ 2g/L, or GA₃ @ 20 ppm 		
Irregular fruiting	<ul style="list-style-type: none"> ○ Girdling during last week of August or first week of September ○ Use of paclobutrazole @ 2g a.i./m canopy length 		

5.4.5. Farm Mechanisation

5.4.5.1.

5.4.5.2. Farm Mechanisation

Available Machinery and equipment's / implements (Applicant may mention available implements or those proposed to be purchased)

S. No.	Operations	Available Machinery and equipment's / implements	Proposed use	justification
1	Ploughing and tilling	Tractor, cultivator, rotavator		
2	Spraying	Power operated sprayer		
3	Harvesting	Hydraulic harvesting platform		
4	Weed management	Brush cutter		
5	Others			

Plant & Machinery proposed to be used or procured on outsourcing and on his own

S. No.	Operations	Plant & Machinery proposed to be used	Out sourcing / own purchase	Cost	justification
1	Ploughing	Tractor/garden Tractor		8.00 lakh	
2	Spraying	Self-propelled boom sprayer		5.00 lakh	
3	Harvesting	Mechanized hydraulic harvester		20.00 lakh	
4	Pruning	Automatic pruner/Pneumatic pruner		15 lakh	
5	Storage & transport of fruits	Reefer van		20 lakh	

5.4.6. fruit management and harvesting

5.4.6.1. Harvesting season- Across India

State/UT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tripura				√	√							
Assam					√	√						
Bihar					√	√						
West Bengal					√	√						
Jharkhand					√	√						
UP					√	√	√					
Uttarakhand						√	√					
Punjab and Jammu						√	√					
Kerala/TN/Karnataka	√											√

5.4.6.2. Harvesting season- Across the project state /UT

District/ Production area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

5.4.6.3. Harvesting stage based on purpose and market (local/distant market):

Fruits are harvested when the TSS: Acid ratio is more than 40. Normally, the fruits should attain a TSS of 17-21°B and acidity of 0.3-0.5%. Fruit length attains > 33 mm. Formation of bright red colour of fruit peel and rosy fragrance are also reliable indicators of harvest maturity.

5.4.6.4. Harvesting technology and Fruit care management

Global best practices		
As recommended by ICAR-NRCL	Pre-harvest Management	Fruit bunch bagging for production of quality fruit
	Maturity Index / determination	Fruits are harvested when the TSS: Acid ratio is more than 40. Normally, the fruits should attain a TSS of 17-21°B and acidity of 0.3-0.5%. Fruit length attains > 33 mm. Formation of bright red colour of fruit peel and rosy fragrance are also reliable indicators of harvest maturity.
	Technique	Harvested in the early morning hours. Whole bunch along with a portion of fruit stalk/peduncle is harvested.

	Devices	Secateur
	Skills and training	Trained man-power to grade the fruit
	Time/ Period	May-June
	Handling	Optimum temperature in handling area must be maintained
	<p>The publications mentioned here are notable reference books on litchi cultivation.</p> <ul style="list-style-type: none"> ○ The Litchi, FAO Publication, New Delhi, 2012 ○ Litchi: Preventive Practices and Curative Measures, SSPH, New Delhi ○ Litchi: Global Perspectives, Excel Publishers, New Delhi <p>Applicant can refer these books for obtaining up to date information on every aspect of litchi covering varietal description, crop husbandry and agro-techniques, plant protection measures, postharvest management and value addition. In addition, the applicant can visit the website of ICAR-NRCL (www.nrclitchi.org) for latest information on crop husbandry / PHM/ value addition in litchi.</p>	
Relevant Photographs if any		
Action taken / proposed by the applicant		
Points of Deviation if any and justification		

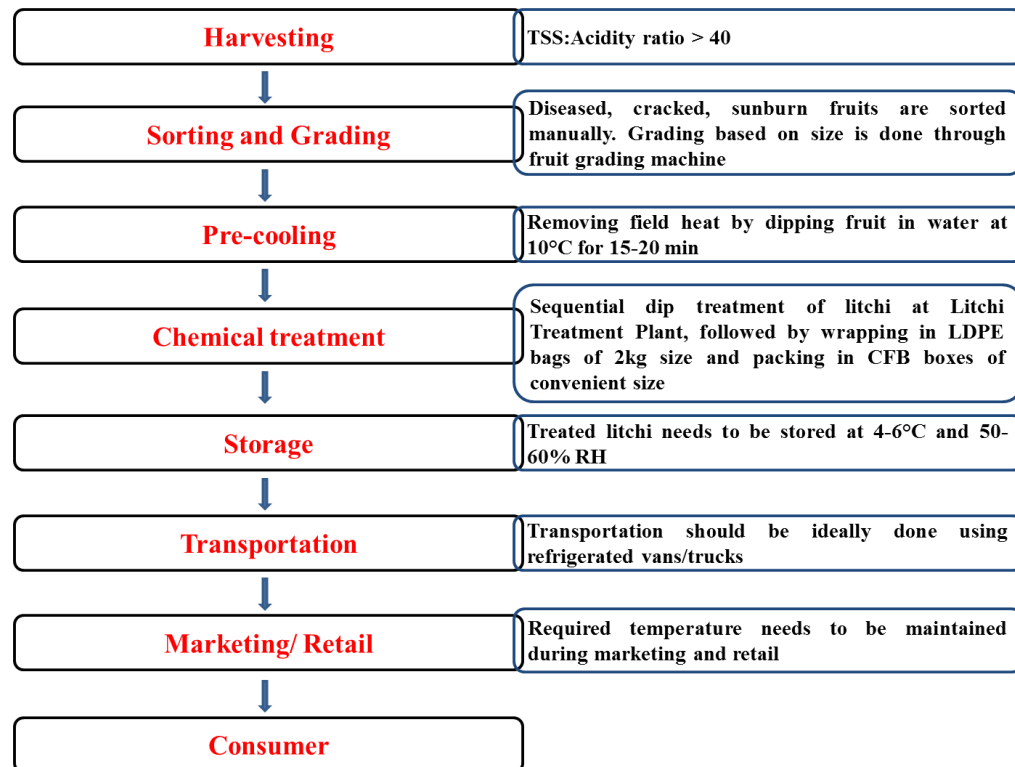
5.4.6.5. Expected Yield / Acre and for the project area in a Year: (The project site should have an expected yield at par with national average)

5.5.	Post-Harvest Management	
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5.5.1. Postharvest infrastructure scenario in horticulture sector in the State and especially for litchi (Write in detail for project area and state)

5.5.2. Product / Process Flow chart- Illustrative

Standard flow chart –Litchi



5.5.3. Lay out/ Floor Plan of Postharvest operations

1. Sorting/Grading
2. Cleaning / Washing
3. Pre-treatments (chemical treatment, etc.)
4. Packing
5. Pre-cooling
6. Palletization
7. Cold Storage
8. Transport

5.5.4. Postharvest operations

1. Sorting and grading including manual/mechanised; model/make, capacity and protocols.

Activity	Recommended	Proposed practice	Remarks
Sorting	Remove bruised, blemished, damaged, injured, cracked, sunburn fruit. Operation should be done at 20°C		
Grading	Fruits can be graded based on fruit diameter of 33, 28 and 23 mm		
Packaging	CFB boxes of 2-5 kg capacity with 7 ply		
Storage	4-6°C		
Transportation	Refrigerated transport		

2. Pre-Cooling (Also specify protocols to be followed)

Activity	Recommended	Proposed practice	Remarks
Pre-cooling	Hydro-cooling @ 4°C or air-cooling		

3. Pre-treatments (chemical treatment, etc.) and protocols.

Activity	Recommended	Proposed practice	Remarks
Dip treatment	BARC-NRCL protocol		
Sulfitation	Sulphur fumigation @ 600g /tonne fruit*		

*Many countries has reservation to accept sulphited litchi fruit

4. Packaging and Labelling

(Including steps/ processes, norms, protocols, manual/mechanised; model/make, capacity, turn over / hour; palletisation; wooden/plastic / any other. In case of exports are you aware of compliance requirements as provided by APEDA-

http://apeda.gov.in/apedawebsite/six_head_product/FFV.htm)

Activity	Recommended	Proposed practice	Remarks
Pre-treatment	NRCL-BARC protocol		
Packaging	CFB boxes of 2-5 kg and 7 ply		
Labelling	As required		
Traceability	QR code or barcode		

5. Mode of Transport including the requirement of Reefer vans

	Recommended	Present status	Gap / Remarks
Transport method			
Local Market	Open vans or pick ups		
District Market	Pick ups		
Distant Market	Trucks/ Train/Air		
Exports	Air		

1. Storage Cold room and Cold Chain

Activity	Recommended	Proposed practice	Remarks
Cold rooms	4-5 Tonne capacity and 4-6°C temperature		
Cool chain	Reefer vans		

5.5.5. Postharvest Infrastructure – Integrated Postharvest Management

Type of project	New Project/ Expansion/Modernisation	
Location of the Project		
Man power employed (On rolls and on contract)		
Business model -	Rental, Captive, Part of Supply chain service, mixed	
Components of project submitted		
	Infrastructure under the scheme	Tick mark
	Integrated PHM	
	Integrated Pack house	
	Pack House	
	Pre-cooling unit	
	Cold Room (Staging)	
	Mobile Pre-cooling unit	
	Primary Processing	
	Reefer van	
	Retail outlet	
Types of products to be handled		

Note: In case the project includes any of the post-harvest infrastructure units. Only the relevant details and data sheet should be part of the DPR.

5.5.5.1. Integrated Pack house:

1. Rationale for the proposal
2. Stages / process flow chart.
3. Raw Material:
 - a. Types/ Quality of raw material- Grades/ Specifications
 - b. Raw material availability and procurement: Details of own production if any and local production annually with 5 years data with future projections. Markets and farm areas of procurement and reliability.
 - c. Quality control/ assurance /testing
4. Pack house/ Sorting and Grading unit:
 - a. Existing number of units, available capacity and utilisation in the project block, district and the State.
 - b. Products and services and projections.
 - c. Statutory requirements / licensing details if any.
5. Products, Bi products and services
 - a. Various products – Quality, specifications etc.
 - b. Annual output for the last 3 years in the project block, district and state.
 - c. Projections for 7 years.
 - d. Packing and labelling
6. Market :
 - a. Quality grades/ specifications/ kinds of products
 - b. Demand and Supply data for the products and services.
 - c. Business model for the unit.
7. Source of Technology
8. Pack house unit: Type and Lay out (show the drawing)
9. Technical standards-Civil infrastructure and Plant and Machinery, accessories: Refer NHB guidelines on Technical Standards
(Proposed Design, layout and Photographic evidence certified by chartered engineer is required to be submitted in case the project is considered for processing)

Plant & Machinery	Recommended technical standards	Proposed	Make	No. of units	Unit cost	Total cost

10. Protocols

Activity	Recommended	Proposed practice	Remarks

11. Compliance to relevant BIS code and standards- Electrical, Mechanical- Yes/No.

12. Skilled Manpower availability:

Facility / utility	Recommended	Proposed including design and capacity.	Company Make /	Remarks

Reference Data Sheet

#	Component: Integrated Pack house	Description
1	Pack house Handling capacity	Specify total incoming volume of raw produce in MT/day.
2	Products to be handled	Describe the details of the products planned for value addition.
3	Area of the pack house	Specify the total Plinth area of the construction in m ² .
4	Receiving Area (L x W x H)m	Provide the dimensions of the receiving, weighing and preliminary handling area.
5	Dimension of the building (L x W x H) m	Provide the total covered area of the building.
6	Handling Area (L x W x H)m	External dimensions of the designated sorting, grading, cleaning and packing area.
7	Roof Details	Provide the construction material and specifications of roof.
8	Outer walls and Flooring Details	Description of the outer walls and flooring of enclosed area (food grade materials).
9	Lighting - Internal and External	Type of lighting used (CFL/LED/Normal – total numbers and wattage).
10	Door/ Window Details	Number and Dimensions of openings - doors and windows.
11	Pest control details	Number and details of pest control used (air curtains, other equipment, etc.).
12	Fumigation Details	Specify the details of fumigation if used.
13	De-sapping tables	Specify use of de-sapping tables if used.
14	Mechanised Conveyor system & capacity	Dimensions of conveyor system – belt or roller based, and throughput handling capacity in tons/hour.
15	Washing and Drying machinery (if used)	Specify the details of throughput capacity/motors/pumps/belts used.
16	Power generating unit	Details of electric generator installed (kVA). If using alternate energy or hybrid systems, provide specifications.
17	Inclusion of Pre-cooling chamber in pack-house	Yes/No
18	Inclusion of staging cold-room in pack-house	Yes/No
19	Layout Drawing	Provide layout drawings of the complete pack house including pre-cooler and staging cold room.

5.5.5.2. Pack house:

1. Rationale for the proposal
2. Stages / process flow chart.
3. Raw Material:
 - a. Types/ Quality of raw material- Grades/ Specifications
 - b. Raw material availability and procurement: Details of own production if any and local production annually with 5 years data with future projections. Markets and farm areas of procurement and reliability.
 - c. Quality control/ assurance /testing
4. Pack house/ Sorting and Grading unit:
 - a. Existing number of units, available capacity and utilisation in the project block, district and the State.
 - b. Products and services and projections.
 - c. Statutory requirements / licensing details if any.
5. Products, Bi products and services
 - a. Various products – Quality, specifications etc.
 - b. Annual output for the last 3 years in the project block, district and state.
 - c. Projections for 7 years.
 - d. Packing and labelling
6. Market :
 - a. Quality grades/ specifications/ kinds of products
 - b. Demand and Supply data for the products and services.
 - c. Business model for the unit.
7. Source of Technology
8. Pack house unit: Type and Lay out (show the drawing)
9. Technical standards-Civil infrastructure and Plant and Machinery, accessories: Refer NHB guidelines on Technical Standards
10. (Proposed Design, layout and Photographic evidence certified by charter engineer is required to be submitted in case the project is considered for processing)

Plant & Machinery	Recommended technical standards	Proposed	Make	No.of units	Unit cost	Total cost

11. Protocols

Activity	Recommended	Proposed practice	Remarks

12. Compliance to relevant BIS code and standards- Electrical, Mechanical- Yes/No.

13. Skilled Manpower availability:

Facility / utility	Recommended	Proposed including design and capacity.	Company Make /	Remarks

14. Data sheet.

5.5.5.3. Pre-cooling unit

1. Rationale for the proposal
2. Stages / process flow chart.
3. Raw Material:
 - a. Types/ Quality of raw material- Grades/ Specifications
 - b. Raw material availability and procurement: Details of own production if any and local production annually with 5 years data with future projections. Markets and farm areas of procurement and reliability.
 - c. Quality control/ assurance /testing
4. Pre-cooling unit:
 - a. Existing number of units, available capacity and utilisation in the project block, district and the State.
 - b. Products and services and projections.
 - c. Statutory requirements / licensing details if any.
5. Products, Bi products and services
 - a. Various products – Quality, specifications etc.
 - b. Annual output for the last 3 years in the project block, district and state.
 - c. Projections for 7 years.
 - d. Packing and labelling
6. Market :
 - a. Quality grades/ specifications/ kinds of products
 - b. Demand and Supply data for the products and services.
 - c. Business model for the unit.
7. Technology / Source/ Company/Make
8. Pre-cooling unit: Type and Lay out (show the drawing)
9. Technical standards-Civil infrastructure and Plant and Machinery, accessories: Refer NHB guidelines on Technical Standards (Proposed Design, layout and Photographic evidence certified by charter engineer is required to be submitted in case the project is considered for processing)

Plant & Machinery	Recommended technical standards	Proposed	Make	No.of units	Unit cost	Total cost

10. Skilled Manpower availability:

Reference Data Sheet

#	Component: Pre-cooling unit	Description
1	Produce to be pre-cooled	Name the produce types to be handled.
2	Unit Package load	Specify packaging used- Pallet, Boxes, others.
3	Pre-cooler volumetric capacity	Provide pre-cooler physical volume in cubic meters. Specify the (L x B x H) of pre-cooling unit in metres
4	Cooling System used	Describe type of precooling - forced-air cooling, hydro-cooling / icing / vacuum cooling / room cooling.
5	Temperature and RH levels.	Temperature in degree Celsius and relative humidity in % designed for.
6	Pull down time (batch time)	Time duration per batch to bring the initial product temperature to the storage temperature.
7	No of batches planned in a day	List the number of batches planned per day.
8	Refrigeration Load	Estimated refrigeration load in kW.
9	Insulating material used	Type of insulating material, thickness and 'U Value'.
10	Evaporator/Chiller make	Maker name and model of the evaporator/chiller unit.
11	Air flow & static pressure.	Pre-cooler air flow in cubic meter per hour and static pressure in kPa.
12	No of fans	Specify the quantity of evaporator fans and connected motor power.
13	Water pump capacity	Specify the water flow in m ³
14	Motor rating	Specify the pump motor capacity in kW.
15	Make of condensing unit	Maker name and model of condensing unit.
16	Refrigeration of condensing	Specify the capacity of condensing unit in kW.
#	Component: Pre-cooling unit	Description
	Unit	
17	Condensing unit type	Specify the whether it is air cooled or water cooled.
18	Door details	Dimensions, insulation material and thickness of the door.
19	Controls Used	Specify the electronic controller for room temperature and relative humidity monitoring & control.
20	Refrigerant used	Technical name of refrigerant.
21	Total connected Power	Specify the total connected power in kW.
22	Power generating unit	Details of electric generator used (kVA). Capacity must be sufficient for operating pre-cooler and staging cold room.
23	Layout Drawing	Provide layout drawings of the pre-cooling unit including pack-house and staging cold room.

5.5.5.4. Cold room

Applicant may mention specifications of either convention or solar cold room.

Reference Data Sheet

#	Component: Staging Cold Room	Description
1	Products to be stored	Name the produce types to be precooled and stored.
2	Temperature and RH levels.	Temperature in degree Celsius and relative humidity in % designed for.
3	Staging cold room dimension	Dimensions of the insulated cold room (L x B x H) in mtrs.
4	Insulation used	Type of insulating material and thickness along with 'U Value'.
5	Refrigeration Load	Total refrigeration load in kW.
6	Evaporator/Air-cooler make	Maker name and model of the evaporator/air-cooler unit.
7	Evaporator construction	Details for heat exchange coil, fans.
8	Air flow	Air cooler air flow in cubic meter per hour.
9	No of fans	Quantity of evaporator fans and connected motor power.
10	Make of condensing unit	Maker name and model of condenser unit.
11	Refrigeration of condensing Unit	Refrigeration Capacity of condensing unit in kW.
12	Door details	Provide the dimensions, insulation material and thickness of the door.
13	Controls Used	List the electronic controller for room temperature and relative humidity monitoring & control.
14	Refrigerant used	Technical name of refrigerant.
15	Total connected Power	Total electric Load in kW.
16	Layout Drawing	Provide layout drawings of the staging cold room unit including pre-cooler and pack-house.

All mandatory rules & regulations (BIS, ISO, IS etc.) relevant to the item must be complied with.

5.5.5.5. Mobile Pre-cooling unit

5.5.5.6. Primary Processing unit

1. Rationale for the proposal
2. Stages in Primary Processing and flow chart.
3. Raw Material:
 - a. Types/ Quality of raw material- Grades/ Specifications
 - b. Raw material availability and procurement: Details of own production if any and local production annually with 5 years data with future projections. Markets and farm areas of procurement and reliability.
 - c. Raw material quality and assurance testing
4. Industry:
 - a. Existing number of units, available capacity and utilisation in the project block, district and the State.
 - b. Products and services and projections.
 - c. Statutory requirements / licensing details if any.
5. Products, Bi products and services
 - a. Various products – Quality, specifications etc.
 - b. Annual output for the last 3 years in the project block, district and state.
 - c. Projections for 7 years.
 - d. Packing and labelling
6. Market :
 - a. Quality grades/ specifications/ kinds of products
 - b. Demand and Supply data for the products and services.
 - c. Business model for the unit.
7. Source of Technology
8. Civil infrastructure. Design, layout and Photographic evidence certified by chartered engineer is required to be submitted in case the project is considered for processing.

Facility / utility	Recommended	Proposed.	Remarks

9. Plant & Machinery: Rationale, Design, Capacity, After service, Warranty (Design, layout and Photographic evidence certified by chartered engineer is required to be submitted in case the project is considered for processing).

Plant & Machinery	Recommended technical standards	Proposed machinery standards	Make	No. of units	Unit cost	Total cost

13. Availability of
 - a. Managerial manpower
 - b. Technical manpower
 - c. Skilled manpower
 - d. Un skilled manpower

5.5.5.7. Reefer Van

1. Introduction

REEFER CONTAINER

Component Definition

A reefer container describes a multi-modal insulated container box with integrated refrigeration equipment. Unlike fixed body trucks, reefer containers can be released from the trailer chassis and handled as a unit load or be stationed on site for localised use as a temporary temperature controlled store pending subsequent operations. This allows the prime motive and/or trailer to be utilised for other carriage.

Component Description

A cost norm of Rs 6 lakh per 9 MT (20 foot container) as defined in code ISO/ TC 104, ISO 668:2013, ISO Code 22R1, 45R1 is applied as part of add-on components.

The component name “Reefer Container” is a temperature controlled unit whose insulating body is made of prefabricated insulating panels. The container is designed to be liftable for mounting on or unloading off a carrier-bed and has both forklift and top lift tolerant design. It has one fixed door at the end opposite to the reefer unit. The air transit pattern is bottom-up from floor to ceiling and the floor section is designed to allow air to circulate under the cargo. A fresh air intake system is in-built making it most suitable for horticulture produce.

Reefer container shall be designed for the full range of standard temperatures ranging from -25 degree Celsius to +25 degree Celsius. There shall be provision for temperature recording, capable to program set-point for either supply air or return air. As this equipment is a removable unit on a transport chassis, the corner posts must have locking facility to secure the container on its carrier.

Such container designs are of the same standard use for export and import of horticultural produce by sea and the design is considered optimal for long haul of perishables. All applicable safety norms shall apply to reefer containers.

Remarks/ Recommendations

The subsidy is intended to incentivise use of reefer containers in domestic cold-chain and beneficiary should be advised not to view this as an option to procure containers for international haulage.

There are multiple advantages to utilising such reefer containers, some of which are enumerated-

1. Dimensions are optimised for standardised pallet carriage; thereby allowing for standardisation in handling of perishable cargo in cold stores and in transit.
2. Available on demand as prefabricated units (in use globally) and hence is delinked with fabrication (delivery delays) as in case of fixed body reefer trucks.
3. Design incorporates fresh air venting which is necessary for perishable crops under long haul movement, for e.g. Himachal to Bangalore, a road trip of more than 9 days (equivalent to a trans-Atlantic crossing by ship). Venting also helps minimise ethylene build up (fruits and vegetables).

4. Design allows for multi-modal utility – by road / rail / ship. This will help develop and optimise goods movement by rail or coastal shipping without undue handling of goods.
5. Designed for plug-in electricity source and can be used as mini storage at various locations, pending further activity.
6. Refrigerated body can be dismounted / delinked from primary vehicle, freeing the prime motive or vehicle for other gainful work or other carriage options.
7. There are other design aspects that allow for innovative application of this component.

The reefer containers have computerised cooling system controls, enabling precise temperature control which is important in case of long haulage of horticulture goods. The air ventilation port allows for high respiring perishable goods to continue to have life sustaining oxygen, especially when in-transit in enclosed space for longer than 3 days. These ventilation ports are adjustable to suit the varied demand pattern of fresh fruits and vegetables. It must be noted, that lack of oxygen and build-up of respired CO₂ cause demise of horticulture goods when enclosed over long periods.



Photographs sourced from NCCD members



2. Rationale for the proposal
3. Product / Process flow chart.
4. Produce / Raw Material:
 - a. Types/ Quality of raw material- Grades/ Specifications
 - b. Raw material availability and procurement: Details of own production if any and local production annually with 5 years data with future projections. Markets and farm areas of procurement and reliability.
 - c. Produce/ Raw material quality and assurance testing
5. Enterprise:
 - a. Existing number of units, available capacity and utilisation in the project block, district and the State.
 - b. Products and services and projections.
 - c. Statutory requirements / licensing details if any.
6. Market :
 - a. Quality grades/ specifications/ kinds of products
 - b. Demand and Supply data for the products and services.
 - c. Business model for the unit.
7. Source of Technology
8. Civil infrastructure, Plant and Machinery. Design, layout and Photographic evidence certified by chartered engineer is required to be submitted in case the project is considered for processing.

Facility / utility	Recommended	Proposed.	Remarks

9. Skilled Manpower availability:

Reference Data Sheet

#	Component: Reefer Container	Description
1	Container dimensions	20 standard: 8' x 8.5' x 20', 27 to 28 cum
2	Insulation details	Thermal Conductivity value / mm
3	Tare weight	kgs
4	Gross weight	kgs
#	Component: Reefer Container	Description
5	Temperature recording	type
6	GPS System	Must be fitted
7	Refrigeration capacity	kW
8	Refrigerant used	Technical name of refrigerant
9	Fresh air exchange	Describe system fitted
10	Diesel/electric auto-switching	Describe dual power unit
11	Air flow cum/hr (CFM)	Evaporator air flow in CFM
12	Temperature control precision +/- °C	Precision in controls in °C
13	Name of Manufacturer	
14	Year of manufacture	
15	Any design enhancement	Describe design changes is any

Codes and References		
1	ISO/ TC 104	Freight containers
2	ISO 668:2013	Classification, dimensions and ratings
3	ISO/NP 1161:1990	Corner fittings
4	ISO 1496/2 : 1996	Specification and testing
5	ISO Code 22R1, 45R1	Size of container
6	ISO 6346: 1995	Coding, Identification and Marking
7	ISO-14001:2004	Environmental Management
8	ISO 1496/2	Performance test of thermal appliances

All mandatory rules & regulations (BIS, ISO, IS etc.) relevant to the item must be complied with.

5.5.5.8. Retail outlet

1. Introduction:

RETAIL SHELF

Component Definition

The Retail Shelf equipment's are temperature and/or humidity controlled cabinets or shelves that help in merchandising of fresh horticulture produce by maintaining the on-shelf quality of fruits and vegetables.

Component Description

A maximum admissible cost norm of Rs 10 lac per establishment is applicable for a Retail shelf as part of add on components for credit linked subsidy. This does not limit the establishment from utilising more retail shelves as per requirement or from sourcing equipment with higher costs or options.

The Component name "Retail Shelf" can consist of individual items such as:

1. Multi-decks
2. Small Multi-decks
3. Roll In decks
4. Vertical Decks
5. Specialised cool shelving
6. Associated refrigeration and humidification equipment.

All applicable safety and performance norms shall apply to Retail Shelf component.

10. Rationale for the proposal

11. Product / Process flow chart.

12. Produce / Raw Material:

- a. Types/ Quality of raw material- Grades/ Specifications
- b. Raw material availability and procurement: Details of own production if any and local production annually with 5 years data with future projections. Markets and farm areas of procurement and reliability.
- c. Produce/ Raw material quality and assurance testing

13. Enterprise:

- a. Existing number of units, available capacity and utilisation in the project block, district and the State.
- b. Products and services and projections.
- c. Statutory requirements / licensing details if any.

14. Market :

- a. Quality grades/ specifications/ kinds of products
- b. Demand and Supply data for the products and services.
- c. Business model for the unit.

15. Source of Technology

16. Civil infrastructure, Plant and Machinery. Design, layout and Photographic evidence certified by chartered engineer is required to be submitted in case the project is considered for processing.

Facility utility /	Recommended	Proposed.	Remarks

17. Skilled Manpower availability:



Representative Photographs from www

Reference Data Sheet

#	Component: Retail Shelf	Description
1	Name of Manufacturer	Provide the name of manufacturer and model.
2	Type	Specify the kind of Retail Shelf i.e. Multi-decks, Small Multi-decks, Roll In's.
3	Produce to be handled	Name types of produce to be handled
4	Capacity	Storable volume of fresh products the shelf can store in m ³ .
5	Dimension external	Specify the floor area occupied by the retail and height in mtr
6	Electronics	Specify energy saving electronics and the automatic cut-off/start are provided.
7	Temperature Range	Specify the operating Temperature Range of the Retail Shelf as specified by the Manufacturer.
8	RH control	Provide details of RH controls
9	Lighting system	Provide details and kW of lights used
10	Total Refrigeration capacity	Provide the capacity of refrigeration unit of the shelf in kW.
11	Refrigerant used	Provide the technical name of refrigerant.
12	Energy consumption	Total power consumption of the shelf in kW.
13	Years in business	Provide details of retail shop, years in business, annual sales volume, etc.

5.6	Marketing/Marketing infrastructure
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5.6.1. Connectivity of project site and produce

Road connectivity	
Rail connectivity	
Air connectivity	

5.6.2. Nearest produce Assembling / Aggregation unit/ place if any

5.6.3. Existing Market Institutions – Agri. produce Market Committees etc

- a) Near to Project site
- b) Within the District / Neighbourhood districts
- c) Within the State
- d) In Adjacent State

5.6.4. Alternative Marketing strategies

- a. Pre-harvest contract
- b. On Farm Marketing
- c. Retail Marketing
- d. Wholesale marketing
- e. Online Marketing
- f. Exports

5.6.5. Traceability Record/ system proposed if any for packs.

5.6.6. Proposed value chain / method of Marketing by the Applicant

5.7	Value Addition/ Processing
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Potential for the processing of crop produce / commodity and facilities / infrastructure available

S. No.	Processing product (s)	Infrastructure / Processing units available	Capacity	% capacity utilisation	Remarks

6	Technology providers
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6.1. Research Institute (s) [ICAR/CAU/SAU/SHU etc.] providing / from which technical details are ascertained

1. ICAR-National Research Centre on Litchi, Muzaffarpur, Bihar
2. ICAR-RCER, Ranchi Centre, Jharkhand
3. BAU, Sabour, Bihar
4. G.B. Pant University of Agriculture and Technology, Pantnagar
5. PAU, Ludhiana, Punjab
6. Dr. YSPUHF, Solan, Himachal Pradesh
7. Others if any

6.2. Experts-whose services are availed -Crop expert / Subject Matter Specialist (SMS) and other experts consulted DPR preparation.

Crop Expert	Name of Horticulturist/ Crop Expert	
(Mandatory)	Current profession:	
	Educational Qualification and University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	
Hi-Tech Expert	Name of Expert	
(Desirable)	Current profession:	
	Educational Qualification and University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	
Postharvest Management Expert	Name of PHM Expert	
(Desirable)	Current profession:	
	Educational Qualification and University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	
Cold storage / Infra Expert / Charter Engineer	Name of Expert	
(Desirable)	Current profession:	
	Educational Qualification and University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	
Market Expert	Name of Expert	
(Desirable)	Current profession:	
	Educational Qualification and University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	
Project Finance	Name of Expert	
(Mandatory)	Current profession:	
	Educational Qualification and University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	

6.2. Agri-Business Incubators

1. List of Incubators nearest to the project.
2. If any assistance is taken from the incubators, details

7	Food Safety – With / Without Good Agricultural Practices Certification
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7.1.	GAP	Optional
	Whether the applicant proposes to undertake Good Agricultural Practices?	Yes/No
	If Yes. What brand / kind GAP – Provide details of brand	
	Provide Certifying Agency details and contact person	
	NABL lab whose services are proposed to be availed to assure compliance with regard to pesticide / chemical residue.	

7.2. FOOD SAFETY MEASURES

7.2.1. Pre-Planting Measures

Activity	Action taken /Proposed to be in the project
1. Site selection: Land or site for litchi production should be selected on the basis of land history	
2. Water and soil testing of project site from recognised laboratory	
3. Use well decomposed manures	
4. Pit preparation as per standard norms	

7.2.2. Production Measures

1. Water quality Use clean potable water for irrigation or chemical spray	
2. Follow GAP norms for litchi	
3. Worker facilities and hygiene	
a) Farmers should get proper training to make them understand the relationship between food safety and personal hygiene. These facilities should be monitored and enforced.	
b) Ideally, farm workers should be provided clean, well-maintained and hygienic toilet facilities around the farming areas separately for the male and female.	

7.2.3. Harvest

1. Clean harvest aids	
a) Bins and all crop containers have to washed and rinsed under high pressure. All crop containers should be sanitized before harvest.	
b) Bins should be properly covered, when not in used to avoid contamination by birds and animals.	

2. Worker hygiene and training	
a) Good personal hygiene is particularly important during the harvest of litchi. Sick employees or those with contaminated hands can spread pathogens to produce.	
b) Employee awareness, meaningful training and accessible rest-room facilities with hand wash stations encourage good hygiene.	

7.2.4. Post-Harvest Handling

1. Worker hygiene	
a) Hands can contaminate fresh fruits and vegetables with harmful microbes	
b) Packing area should be cleaned and sanitized.	
c) Supply liquid soap in dispensers, potable water, and single-use paper towels for hand washing.	
d) Packing area should be cleaned and sanitized. Supply liquid soap in dispensers, potable water, and single-use paper towels for hand washing.	
e) Workers should be properly educated about the importance of restroom use and proper hand washing.	
f) Encourage proper use of disposable gloves on packing lines.	
g) Sick employee should not be given food-contact jobs.	
2. Monitor wash water quality	
a. Potable water should be preferably used in all washing operations.	
b. Use chlorinated water and other labeled disinfectants to wash fresh produce.	
3. Sanitize packinghouse and packing operations	
a. Loading, staging, and all food contact surfaces should be cleaned and sanitized at the end of each day.	
b. Exclude all animals, especially rodents and birds from the packinghouse.	
c. Wash, rinse and sanitize the packing line belts, conveyors, and food contact surfaces at the end of each day to avoid buildup of harmful microorganisms.	
d. Packaging material should be stored in a clean area	
4. Pre-cooling and cold storage	
a. After harvesting, litchi should be quickly cooled to minimize the growth of pathogens	

and maintain good quality.	
b. Cold room should not be overloaded beyond cooling capacity.	
5. Transportation of produce from farm to market	
a) Proper cleanliness of the transportation vehicles should be ensured before loading.	
b) Farmers have to make sure that litchi is not shipped in trucks which have live animals or harmful substances.	
c) For traceability norms, it must be ensured that each package leaving the farm can be traced to field of origin and date of packing	

8. Innovation, if any

9. Profitability of the project (Horti-business): Critical observations of Applicant

10	Checklist
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Check list for Detail Project Report (DPR)

		Mandatory Information	Document / Evidence *	Tick Mark
	Project at a Glance	√		
1	About the Applicant /Promoter	√		
2	Details of benefits availedby the Applicant / Promoter	√		
3	About Project -Name, rationale, Management and Description			
	1. Name of Project, Activity, Objectives and expected Outcomes	√		
	2. Rationale / Justification for the project	√		
	3. Site/ Land details- RoR/ Ownership / Registration of lease/ map etc.	√	Certified Land revenue documents	
	4. Location of the Project- Identification	√		
	5. Current usage of land of proposed Project Area	√		
	6. Current infrastructure and assets possessed by the Applicant:	√		
	7. Lay out plan of the project	√	Lay out Plan	
	8. Conversion of Land Use (CLU)	√	Certificate from competent authority	
	9. Whether project site is part of production belt / cluster / hub	√		
	10. Rationale for the location of the project	√		
	11. Compliance of project site for food safety	√		
	12. Components / Activities of the Project with justification	√		
	13. Operations planning	√		
	14. Month wise operational chart / Implementation schedule	√		
	15. Backward and Forward linkages.	√		
	16. Manpower (Skilled & Unskilled labour etc.) availability	√		
	17. Infrastructure (Power, Fuel, Water, Plant and Machinery, connectivity, Effluents treatment etc.)- Required, Already available, Gaps and the management.	√		

	18. Employment generation	√		
	19. SWOT Analysis	√		
	20. Monitoring and evaluation	√	Certificate	
4	NHB Scheme under which the project is proposed with rationale / justification.			
5	Project details	√		
5.1	Agro-climatic suitability / feasibility			
	1. Origin and distribution of crop in the said location and India and in the world (briefly)	√		
	2. Agro-climatic / Horticultural zones and suitability of the crop (s)	√	IMD Data	
	3. Soil type and latest health-suitability for the crop	√	Latest Soil health card (not more than 1 month old)	
	4. Water (irrigation) source, availability, Quality and suitability	√	Latest Water Analysis report (not more than 1 month old)	
5.2	Market viability			
	1. Commercial and Nutritive importance / significance, composition and Uses	√		
	2. Target Market	√		
	3. Area, Production and Productivity in the District, State and India for the last 5 years			
	4. Clusters of the project crop in the state.	√		
	5. Demand and Supply Gap	√	State Horticulture Dept.	
	6. Global producers- Country, Area, Production, Productivity and global market share in the last available 5 years.	√		
	7. International trade and potential (for export oriented projects)	√ @		
	8. Seasonality of fruit and its comparison with other available fruits	√		
	9. Price variation of commodity in the State and nearby markets	√	State Govt.	
	10. Balance sheet of commodity in the State			
	11. Central and State Government policy			
	12. Value chain in the commodity	√		
	13. Proposed Strategy by the Applicant for Marketing and Market viability	√		
5.3	Financial viability			

	1. Due diligence status	√		
	2. Project Cost	√	Certified by CA	
	3. Means of Finance	√		
	4. Investment into Horticulture	√		
	5. Key financial Indicators	√		
	6. Project Financing	√		
	a. Rate of Interest	√		
	b. Returns from the Project (IRR):	√		
	c. Cost of Production and Profitability (Annexure)	√		
	d. Yield and Sales Chart (Annexure)	√		
	e. Proposed Balance Sheet: (Annexure)	√		
	f. Proposed Cash flow Statement for next 7 years (Annexure)	√		
	g. Proposed Profit & Loss Account: (Annexure)	√		
	h. Proposed Repayment of Term loan and Schedule (Annexure)	√		
	i. Break even Analysis (Annexure)	√		
	j. NPV (Net Present Value)	√		
	k. Economic Rate of Return	√		
	7. Farm record keeping/ Maintenance proposed	√	Records	
5.4	Land development and Crop Husbandry			
	5.4.1.Land development	√		
	5.4.2.Selection of Quality Planting Material	√		
	1. Recommended and popular Cultivars-varieties/hybrids, their specific characteristics, requirements and yields	√		
	2. Cultivar/Hybrid/Variety selected and Criterion adopted for selection	√		
	3. Propagation methods	√		
	4. Accredited / Good Nurseries in the area	√		
	5. Planting material-source, quality and suitability	√	Nursery / Shop Invoice with Seed quality	
	5.4.3.Orchard / Site planning, Lay out and management	√		
	1. Planning, establishment and layout systems	√		
	2. Land preparation	√		
	3. Planting Season / time and density and transplanting	√		

	4. Water and Nutrient management	√	Written plan	
	5. Intercultural operations including Weed management	√		
	6. Plant canopy architecture management/ training and pruning	√		
	7. Planting systems and transplanting of horticultural crops	√		
	8. Use of Pollinators	√		
	9. Use of Plant growth regulators	√		
	10. Flowering & fruiting	√		
	11. Integrated Pest and Disease Management and Food Safety measures	√		
	12. Physiological disorders- causes, preventive and management measures.	√		
	13. Special problems if any	√		
	5.4.5.Farm Structures and mechanisation	√		
	1. Farm Mechanisation	√	Company Brochures	
	5.4.6.Harvesting and Fruit care			
5.5	Post-Harvest Management	√		
	1. Postharvest infrastructure scenario in horticulture sector in the State and specially for the proposed crop / component	√		
	2. Product/ Process Flow chart	√		
	3. Lay out / Floor Plan of post-harvest operations	√		
	4. Postharvest operations (Based on applicability)	√	Protocols	
	5. Pre-cooling	√		
	6. Cleaning / Washing	√		
	7. Sorting and Grading	√		
	8. Packing and labelling	√	Models	
	9. Transport	√		
	10. Storage- Low cost / cold storage/ CA	√		
	11. Post-harvest infrastructure – Integrated Postharvest Management- (tick whichever component is proposed)	√	Technical Standards	
	1. Integrated Pack house			
	2. Pack House			
	3. Pre-cooling unit			
	4. Cold Room (Staging)			
	5. Mobile Pre-cooling unit			
	6. Primary Processing			
	7. Reefer van			
	8. Retail outlet			
5.6	Marketing			

	1. Aggregation & Assembling: Marketing infrastructure	√		
	2. Market Institutions and agents	√		
	3. Demand and Supply trends and forecast both in local and National markets.			
	4. Traceability system	√		
	5. Proposed value chain / method of Marketing by the Applicant	√		
5.7	Value addition / Processing	√		
6	Technology providers	√		
	1. ICAR /CAU/ SAU/SHU / Research Stations and Experts names	√		
	2. Agri/Horti-Business incubators	√		
7	Food Safety -With /Without GAP certification			
	1. GAP Certification if any	√		
	2. Food safety measures	√	Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan	
	a. Pre-planting	√		
	b. Crop husbandry	√		
	c. Harvestings	√		
	d. Post-harvest	√		
8	Innovation if any			
9	Risk Management	√	Proposed insurance details if any	
10	Checklist	√		
11	Declaration from Crop Expert and Project Finance Expert	√		
	Self-declaration by the Applicant	√		

Note: *: Documents are to be submitted only when NHB accords Pre- IPA approval.

@ In case of export units.

11.1. Declaration by Crop Expert (if the Project / Crop specific information, data and chapters of DPR are prepared by the expert and not by the applicant)

I have read and understood the latest NHB Schemes operational guidelines and made the applicant understand the same.

The technical information provided in the Detail Project Report are as recommended by ICAR/ State Agriculture / Horticulture University/Research Institute as published in their publication...../ genuine website.....

The project is technically feasible and economically viable and is bankable.

Certified that the information/contents as above furnished by me/us in the application are true to the best of my/our knowledge & belief and nothing material has been concealed.

My details are as follows:

Name of Crop Expert	(Could be any working or retired faculty / scientist in ICAR/ CAU/SAU/SHU/State Horticulture Dept. or ICAR Agri/Horti-business incubators)	
Current/ previous profession:		
Educational qualification and University passed out		
Registration number if any		
Permanent address:		
Contact Number:	Tel	
	Mobile	
	Email	

Place	Signature
Date	Designation and Seal

11.2. Declaration by Project Finance Expert (Chartered accountant)

(If the Market viability and Financial Viability chapters are prepared by the Project Finance Expert and not done by the applicant on his/her own)

I have read and understood the latest NHB Schemes operational guidelines and made the applicant understand the same.

The project is technically feasible and economically viable and is bankable.

The Financial and Market viability as provided in the Detail Project Report is true to the best of my knowledge.

Certified that the information/contents as above furnished by me/us in the application are true to the best of my/our knowledge & belief and nothing material has been concealed.

Name of Chartered Accountant	
Current profession:	
Educational qualification and University passed out	
Registration number if any	
Permanent address:	
Contact Number:	Tel
	Mobile
	Email

Place	Signature
Date	Designation and Seal

12. Self-Declaration by applicant

1. I have read and understood the latest NHB Schemes operational guidelines including conditions, norms and pattern of assistance.
2. The information provided in the Detail Project Report is true to my knowledge.
3. In case the details provided by me viz., (i) my personal details, land, previous benefits availed by me from either Central or State Government if proved false at any stage NHB is entitled to recovery subsidy if any released by it from me.
4. I have personally ascertained technical details of the projector or I have availed the services of a competent Horticulturist for technical details and viability. Accordingly declaration is provided herewith.
5. I have personally ascertained Financial and Market viability of the project or I have availed the services of a competent Project Finance expert for the requisite project finance details and project viability. Accordingly declaration is provided herewith.
6. In case the project is approved for pre-IPA, I shall undergo a 2 Weeks (min.10 working days) training programme in case of Open field condition and protective cover (with or without PHM component) and a minimum of 1 Week programme in case of standalone PHM component at my own expenses in one of the ICAR/CAU/SAU/SHU/ Research Station/ Centres of Excellence/ related Central or State Government institution/ others as found appropriate / approved by NHB.
7. I shall adopt scientific package of practices / technology and maintain proper farm accounts.
8. The project is technically feasible and economically viable and is bankable.
9. In case the project application is considered for application processing, I am bound to submit all required / requisite mandatory documents to establish veracity of my DPR and eligibility to claim subsidy under NHB Schemes in the form prescribed with in 3 months of any such intimation from NHB for according In principle approval (IPA). Else I acknowledge that my application stands vacated and rejected by default of my omission.
10. Incomplete/ NPA projects and default cases shall not be eligible for subsidy.
11. In case the project is approved for subsidy claim I shall undertake a MOU with NHB to comply with all the terms and conditions of the scheme guidelines as effective on the date of subsidy claim approval and any other condition/ advisory in the interest of projects success and sustainability.

Applicant (Name and signature) and Seal if any

Date

Location:

The applicant may consult for advisory services with respect to project in Litchi at the contact details provided below

Dr. Vishal Nath

Director

ICAR-National Research Centre on Litchi

Mushahari Farm, Mushahari

Muzaffarpur (842002), Bihar

Website : www.nrclitchi.org

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Dr. S.D. Pandey

Principal Scientist (Hort) & Chairman, PME

ICAR-NRC on Litchi

Muzaffarpur

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