Detailed Project Report (DPR): Black Pepper

Scheme.1	Development of Commercial cultivation of black pepper
	1. Open field condition
	2. Integrated Post Harvest Management

Crop				Tick mark
Scheme	1.	Open field condition of NHB	Within overall cost ceiling	
components		specified crops	+Farm Mechanisation	
			+Good Agri.Practices (GAP)	
			+Plastic Mulching	
	2.	Integrated PHM		
		3.1.Integrated Pack House		
		3.2.Pack house		
		3.3.Pre-cooling unit		
		3.4. Cold Room (Staging)		
		3.5. Mobile Pre-cooling unit		
		3.6.Ripening Chamber		
		3.7 Primary Processing		
		3.8.Refer Van		
		3.9 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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	2. Curing	-	
	3. Cleaning / Washing	-	
	4. Sorting and Grading	-	
	5. Packing and labelling	-	
	6. Ripening	-	
	7. Transport	-	
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	2. Pack House		
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Project at a Glance

1.	Applicant (s)/ Legal entityName				
2.	Constitution /	Applica	nt nature / beneficiary		
3.	NHB Scheme	e for whic	h DPR is made	Scheme -1	
4.	Project Activ	ity		Black	
				pepper	
5.	Nature of pro	ject- Gre	en field/ pre-existing- expansion / component		
	specific				
6.	Products, By-	-products	and services		
7.	Project Area	and Surve	ey /khasra/ Gat/Dag No.		
8.	Project Site Address with Postal Code and Police Station Name				
9.	Agro-climatio	c suitabili	ty		
10.	Research inst	itution w	hose technology and package of practices are		
	proposed to b	e followe	ed		
11.	Existence of	similar pr	oject activity in the said District		
12.	Whether the	project is	located in the crop cluster/ hub/ belt	Yes/No	
13.	Project econo	mic perio	od/ economic life		
14.	Total Project	Cost			
15.	Open	field con	dition		
	• Integr	ated Post	Harvest Management		
	Total				
16.	Project comp	letion per	iod (in months)		
	Expected Implementation Commencement				
	timeline Completion				
17.	Total Eligible Project cost as assessed by the Applicant as per NHB				
	guidelines				
18.	Bank/ Financ	k/ Financial Institution identified for Term loan			
19.	Proposed Me	ans of	Promoters contribution (in Lakh Rs.)&%		
	Finance		Bank Term loan (in Lakh Rs.) &%		
			Un secured loan (in Lakh Rs.) &%		
			Total		
20.	Likely Emplo	oyment ge	eneration (man days)		
21.	Security				
22.	Gestation per	iod			
23.	Projected	Current	Ratio other than export units		
24.	Key	CR-Exp	port units		
	Financial	IRR /BO	CR		
	Parameters	DSCR*			
		Average	e DSCR		
		Debt to	Equity Ratio i.e DER		
		TOL/T	NW		
		Promote	ers Contribution		
		Break E	Even Point		
		Security	/ Coverage Ratio		
		Repayn	nent period		
25.	Productivity	expected	(in MT/Qtl/Kg/numbers)		
26.	Likely Gap ir	n producti	vity compared to National /Global average		
27.	Potential Market (s) for the commodity and distance from the project				

1. About the Applicant / Promoter and his/her entrepreneurship

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	
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	
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.Statutary 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	General / SC/ST	
(In case of legal entity the	OBC	
CEO and Board of Directors	Minority	
social category is to be	(Muslim/Christians/Sikhs/Buddhists/Parsis/Jains)	
mentioned)	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	In case of TSP a self-attested copy of notification	
/ Hilly States	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 Metric/ U	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/ etc 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 same location, project.- Yes/ No.If Yes, Please provide details

Constitutio	Ministr	Schem	Project	Project	Land	Eligibl	Total	Current
n —	у/	e	/	Locatio	Surve	e	subsid	status of
Individuall	Organi	Name	Activit	n	y No	Project	у/	project-
y or in any	sation		у			cost	grant	Operational
form								/
						(Rs.in	(Rs.in	underutilise
						lakhs)	lakhs)	d / 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 Closed)	Annual Turnover (of 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:

1. 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.

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 (Sh	ould be as per NHB scheme latest
	scheme guidelines- please verify):	

No.	Name of the scheme and component	Unit	Tick mark relevant componen t
5	Development of Commercial Horticulture through		
	Production and Post-Harvest Management of		
	Horticulture Crops		
	1. Open field condition		
	2. Integrated PHM		
	a. 3.1.Pack House		
	b. 3.2.Integrated Pack house		
	c. 3.3.Pre-cooling unit		
	d. 3.4. Cold Room (Staging)		
	e. 3.5. Mobile Pre-cooling unit		
	f. 3.6.Ripening Chamber		
	g. 3.7 Primary Processing		
	h. 3.8 Refer Van		
	i. 3.9.Retail outlet (environmentally		
	controlled)		
	3. Add on components		

6. Details of Crop in case of Open field condition (Black Pepper)

Name of the	Variety /	Area (acres)	No. of plants	Source of
Crops	Hybrid/			Planting
	Cultivar			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, 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 –	Black Pepper
	Open Cultivation (Ha)	
	Protected Cultivation (Sq. Mt)	
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 lar	nd proposed for the project			
as per Land Revenue	Records			
Whether title of the la	nd is clear in the name of			
applicant and is free fi	rom any litigation			
How Title is derived				
	Purchased (with details of date)			
 Encumbrances if any				
Name of the Owner in	n case of joint ownership	Survey/ Gat / khasra No etc.	Area in Sq.mt / Ha	Share
Whether land boundaries are demarcated for the applicant clearly				
In case of Partnership				
1. Whether land firm or jointly	is owned by Partnership 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 lan Registration de land in the off				
2. No. of Years of lease				
3. Whether lease	is entered in RoR	Yes/No		
Whether land is mortg details of mortgagor a	gaged? If yes provide nd 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 Pro	ject		Current usage			
Survey / Dag	Nature of	Area (ha)	Activity /	Area (ha)	Mortgage	
etc.No	land		Crop		Yes/No	
	Dry/				If Yes with	
	Irrigated/				whom	
	Waste land					

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

3.6. Current infrastructure and assets possessed by the Applicant:

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)

	Name of the scheme and component	Justification
No.		
1	Development of Commercial Horticulture	
	through Production and Post-Harvest	
	Management of Horticulture Crops	
	1. Open field for specified crops	Black Pepper
	2. Protected cultivation for specified crops	
	3. Integrated PHM	
	3.1.Integrated Pack house	
	3.2.Pack House	
	3.3.Pre-cooling unit	
	3.4. Cold Room (Staging)	
	3.5. Mobile Pre-cooling unit	
	3.6.Ripening Chamber	
	3.7 Primary Processing	
	3.8. Refer Van	
	3.8.Retail outlet (environmentally	
	controlled)	

Component wise cost of the Project and NHB Norms

Scheme	Items	Sub- items	Capacity/	Units/	Likelv	NHB
Component			Area/	Numbers	/ unit	Norm
- r			spacing/		cost	(Rs/Acre)
			size			× ,
			Etc.			
Open field	Cultivation	Planting material				2500
Cultivation	Expenses	Input cost				MIDH
	1	(Labour, Manure				Norms
		& Fertilisers,				
		pesticides etc.)				
		Others				
	Irrigation	Tube well/ bore				2.5Lakhs/
	U	well/ Open well				
		(Nos.)				
		Cost of Pipeline				150/- per
		from source of				running
		irrigation to				metre (4"
		production				dia)
		unit(Length, Size				
		& Material)				
		Water harvesting				Rs 100/-
		structure / Water				Cum
		tank min. 300				(300micro
		microns				ms/RCC)
		Non lined				30% less
		ponds/tanks				of above
		Others				
	Drip / Sprinkler					20,000/
		-				per Acre
	Civil	Functional pack				Rs 4
	Infrastructure	house				Lakhs per
						unit
		Store & Pump				Rs
		house (Area in				20000/-
		sq.ft with size)				per Acre
		Labour room & go				Rs
		down (Area in				20000/-
		Sq.ft with size)				per Acre
		Others				D 0
	Farm	Tractor upto 20				Ks.3
	Mechanisation	BHP	IID			Lakhs
	(AC)	Power Tiller	HP			Rs.105
		E maine d'				Lakhs
		Equipment's-				30000/
		ariven by Tractor/				per unit
		rower Illier				
		machine				
		machime				

	Self-propelled		
	hort. Machinery		
	Others		
Land	Soil levelling /		15 %
Development	Digging/Fencing		
	etc.		
	Others if any		
Land if newly pu	urchased but not		10%
before one year	from date of		
sanction of Term	n loan (indicate		
year)			
Vermi Compost	Unit		Rs.60000/
			unit
• 1. Permanent	t Structure		Rs.60000/
			unit
• 2, HDPE Ve	rmibed(12ft X 4ft X2 ft)		Rs.10000/
			unit
Certification of (Good Agricultural		Rs.4000/
Practices (GAP)	including		Acre
infrastructure (A	.C)		
Plastic Mulching	Rs.12800		
	/Acre		
Others			
Grand Total			

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 anyoptional	
2.	Name of agency executing erection of Protected	
	structure -and contact person Name and contact	
	numbers	
3.	Name of agency providing technical know-how	ICAR-IISR, Kozhikode,
	and turn key for cultivation- and contact person	Kerala
	Name and contact numbers	0495-2731410
4.	Operations:	
	1. Land preparation	Own / custom hiring
	2. Procuring planting material/ seeds	Own / outsourcing
	3. Orchard planning, layout	Own / outsourcing
	4. Water and nutrient management	Own / outsourcing
	5. Integrated Pest & Disease management	Own / outsourcing
	6. Physiological disorders	Own / outsourcing
	7. Farm Mechanisation	Own / outsourcing
	8. Harvesting/ Fruit care management	Own / outsourcing
	9. Post-Harvest Management	Own / outsourcing
	a. Pre-cooling	Own / outsourcing

b. Curing	Own / outsourcing
c. Cleaning / Washing	Own / outsourcing
d. Sorting and Grading	Own / outsourcing
e. Packing and labelling	Own / outsourcing
f. Ripening	Own / outsourcing
g. Transport	Own / outsourcing
h. Storage- Low cost / Cold Room/	Own / outsourcing
CA	
i. Refer van	Own / outsourcing
j. Retail outlet	Own / outsourcing
k. Cold chain	Own / outsourcing
10. Marketing	Own / outsourcing
11. 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		Uni	Months						
		ts	IE	ЪЛА	MI	ТА	50	ND	
1	Tand		JF Veen 1	MA	IVIJ	JA	50	ND	
1.	Land		Year I						
2	Lond			Veen 1					
Ζ.				Year I					
2	preparation				X 7 1				
3.	Procuring				Year I				
	planting								
	material/								
4	seeds		Veen 1	Veen 1					
4.	Orchard		Year I	Year I					
	planning and								
5	layout		T1	T1	TT1	TT1	T1	T1	
э.	water and		I nrougn	I nrougn	I nrougn	I nrougn	I nrougn	I nrougn	
	munient		out the	out the	out the	out the	out the	out the	
	management								
6	Interneted		Chrouch	C IIIe	C IIIe	C IIIe	C IIIe	Through	
0.	Doct &		Through	i nrougn	i nrougn	i nrougn	i nrougn	out the	
	Pest &		out the	out the	out the	out the	out the	out the	
	Disease								
7	Dhysiological		C me	C me	C me	C me	C me	c me	
/.	Physiological		As and	As and	As and	As and	As and	As and	
	disorders		when	when	when	when	when	when	
0	Earma		occurred	occurred	occurred	occurred	occurred	occurred	
0.	Failli Machanizatio								
	n								
	II-								
0	Farm								
9.	Mechanisatio								
	n operations								
10	Harvesting/								
10	Fruit care								
	management								
11	Post_Harvest								
	Management								
	a) Dehuskin								

g							
b) Sorting							
and							
Grading							
c) Transport							
d) Storage							
e) Cold							
chain							
12. Marketing							
13. Value/		Accordin	Accordin	Accordin	Accordin	Accordin	Accordin
addition		g to the					
Processing		product	product	product	product	product	product
		line	line	line	line	line	line

Note: 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	ICAR-IISR, Kerala	
	Agricultural University	
Manure	Co-Op Societies	
Fertilizers	Co-Op Societies	
Bio fertilizers	State Department of	
	Agriculture	
Bio pesticides	State Department of	
	Agriculture	
Pesticides / Insecticide	Co-Op Societies	
others		

2. Forward linkages- for Domestic and Export Market

Operations	Agency / Agents / Service	Remarks
	providers	
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 an Year.

3.16.1.Managerial and Technical

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

3.16.2. Skilled and Unskilled Labour

		Skilled Labour			Unskilled labour			Gap			
	I	Requirement		Availability		Requirement		Availability		S	US
	1	Number	No.of Days	Number	No.of Days	N	D	Ν	D		
Operation	ons/										
activity											
d) Adm	nistration										
e) Mana	ıger										
f) Finan Acco	unts										
g) Typin opera	ng / IT tions										
h) Wate	h man										
Crop hu *	sbandry										
a) Digg	ing pits										
b) Plant	ing										
c) Base and appli manu fertil	opening cation of res and zers										
d) Irriga (Drip	tion)										
e) Weed (Mac	ling hine)										
f) Plant prote meas	ction ures										

* For 175 plams/ha

3.17. Employment Generation per annum

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	
	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	Facility and method adopted for effluent	
treatment	treatment.	
Road	Distance from the State Highway and	
connectivity	National Highway.	
Rail		
connectivity		
Air connectivity		
Market		
connectivity		
Vermi compost	If available Numbers and Capacity.	
	Types:1. Permanent Structure and 2,	
	HDPE Vermibed (12ft X 4ft X2 ft)	
Animal	Details of Animals	
Husbandry	Capacity / Income	
Environmental		
issues of the		
project if any		
Fencing		
Any other		

3.19. SWOT Analysis

1	Strengths	
		Domestic market
		Excellent R & D
		Empowerment-Decentralised
		Black pepper Producer Societies/ Farmers groups
2	Weaknesses	Global competitiveness
		Diseconomies of scale
		Senile pvines
		Long gestation period
		Price fluctuation
3	Opportunities	Growth rate in spices consumption
		Steady domestic market
		Potential as nutraceutical use/ medicinal use
4	Threats	Evolving Free Trade Agreements
		Stringent food safety norms
		Possible short term price crash
		Biotic and abiotic stresses

3.20. Monitoring and evaluation of Project:

ICAR Institute or CAU/SAU / SHU or Consultant or any other organisation

Attention of the applicant:

- 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.

1. Scheme.1: "Development of Commercial Horticulture through Production and Post Harvest Management of Horticulture Crops".

1.1 Commercial Horticulture Development in Open Field Conditions on Project Mode

National Horticulture Board will take up integrated commercial horticulture development projects in the open field condition on project mode, including components viz planting material, plantation, irrigation, fertigation, mechanisation, precision farming, GAP etc. for projects covering area over 2.00 ha. (5 Acres). Integration of production unit with on farm PHM components and primary processing unit shall also be allowed in project mode. Cost of raising new plantation will vary from crop to crop, which will be taken into consideration while providing assistance to the beneficiary. PHM infrastructures, irrigation and micro irrigation etc shall be eligible under the scheme for assistance in existing/new orchards/ projects to increase productivity.

1.2. Integrated Post Harvest Management projects

The Board will take up Integrated Post Harvest Management projects relating to Pack House, Ripening Chamber, Refer Van, Retail Outlets, Pre-cooling unit, Primary processing etc. NHB will also take up projects in component mode and for standalone projects of PHM components.

2. Cost Norms and pattern of assistance:

2.1 Cost Norms: Black Pepper

No. of plants_/Acre:880 Nos Cost of Planting Material/Acre Rs.2500/-Overall ceiling In Project mode with add on component: Rs.1, 50,000/-

2.2 Pattern of assistance

Credit linked back ended subsidy @ 40% of project cost limited to Rs.30.00 lakh per project in general areas and @ 50% of project cost limited to Rs. 37.50 lakh for NE and Hilly States for subsidy on the pattern of HMNEH States and scheduled areas.

2.3. Cost Norms & Pattern of Assistance

The Maximum cost ceiling of Rs. 145.00 lakhs for the component of PHM project. NHB cost norms for Primary processing at the rate of Rs.25 lakhs / unit.

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:

Black pepper popularly known as 'King of spices' is one of the important and earliest known spices produced and exported from India. Its original home is the dense evergreen forests of Western Ghats in south India. *P. nigrum* belongs to the family Piperaceae which has two types of branches namely, orthotropic and plagiotropic branches. Orthotropic branches are straight, upward growing, with monopodial growth habit and after climbing on a support they become woody with a thick bark and form the central axis of the vine column. Expeditions in search of pepper led to the discovery of new trade routes. The course of Indian history would have been a different one had not the Portuguese sailor Vasco-de gamma took the historic journey from Lisbon in 1497 to Calicut on 20th May, 1498.

Black pepper is believed to have been introduced into Indonesia and the Malaya Archipelago as early as the first century AD, by Arab traders. In Malaysia pepper was first grown in the north Malaya Penisular as early as the Ist century AD and later on encouraged by the British into other parts of the world. Important black pepper producing countries in the world are India, Indonesia, Malaysia, Brazil, Sri Lanka (who are members of the international pepper community, IPC), Thailand, China, Vietnam, Ecuador, Madagascar, and Cambodia. Other countries where pepper is gown on small scale are Mexico, Brunei, Fiji, Samoa, Micronesia, Honduras, St. Lucia, Guatemala, Tanzania, Malawi, Zimbabwe, Benin, Kenya, Cameroon, Ethiopia, Uganda and Zambia.

2. Distribution of crop across the country

In India, black pepper cultivation is mainly confined to Kerala, Karnataka and Tamil Nadu, and to a certain extent in Andaman and Nicobar Islands, Goa, Pondicherry and north-eastern states. Karnataka and Kerala have 27% and 63% of black pepper area and contribute about 54.6 and 34.3 % of total production of black pepper, respectively. However, the crop has great potential to be grown in non-traditional areas such as Andhra Pradesh, West Bengal and in entire north-eastern India. In Kerala, more than 80% of the pepper farms are small (0.2 ha) or medium (0.2 ha to 0.8 ha⁻¹) and black pepper is grown in every homestead and also trailed on arecanut, mango, jackfruit, coconut, shade trees in coffee and tea plantations and on avenue trees.

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	Remarks /
Climata	Tranical	parameters#	
	Tropical Detries 20% North		
Altitude	Between 20° North		
	and South fatitude,		
	un to 1500 m		
Climatric / Non Climatric			
Thermo sensitiveness of crop			
Photosensitive			
Temperature range			
1 Mean monthly /	23 - 32°C with an		
A verage temperature	$23^{\circ} 32^{\circ} C$ with an average of $28^{\circ} C$		
2 Av Max temperature	35 °C		
3 Av night temperature	15 °C		
4 During Crop duration	15-35 °C		
5 Flowering	15 55 6		
6 Fruiting			
7. Maturity			
8. Fruit quality			
9. Season			
Rainfall / Water	1250-2500 mm		
1. Land preparation			
2. Flowering			
3. Fruiting			
4. Maturity			
5. Season			
Humidity	75-90 %		
1. Flowering			
2. Fruiting			
3. Maturity			
4. Season			
Winds during crop season			
1. Wind velocity			
Shade loving?	Partial		

@ Note: Organisation / Institution (ICAR/CAU/SAU/SHU/ other) making recommendation and its source should be specified. @ Recommended by ICAR-IISR, Kozhikode
#: 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 and health -requirements and that of project suitability

(Not applicable to standalone PHM projects)

	As recommended	Project location	Deviation if	Date on which
	by ICAR	data as per latest	any and	soil health is
	/CAU/SAU/SHU	Soil health test	Management	tested and the
				name of the
				Institute
Soil type	Forest loam soils			
	which are			
	generally acidic			
Texture	Loamy			
pН	5.5-6.5			
Organic carbon	1.5-2.5%			
Electrical	< 1 dSm ⁻¹			
conductivity				
Potassium	>200 kg/ha			
Nitrogen	>250 kg/ha			
Phosphorus	>12 kg/ha			

@ Note: Organisation / Institution (ICAR/CAU/SAU/SHU/ other) making recommendation and its source should be specified.

#: 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 by	Project location data as per
	ICAR /CAU/SAU/SHU	latest Water Analysis test#
pH	6-7	
EC	< 1 dSm-1	
Total salt concentration / TDS	< 1000 mg/L	
Sodium Absorption Ratio	< 10	
(SAR)		
Bi-Carbonate	< 1.25	
Boron concentration	< 1	
Heavy metals	-	
Pesticide residue	-	

@ Note: Organisation / Institution (ICAR/CAU/SAU/SHU/ other) making recommendation and its source should be specified.

#: 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	Yes / No
suitable for the crop / activity.	

5.2. Project- Market viability of the Project

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

The composition of black pepper varies with the seeds and the capsules and its volatile oil, as detailed below: *Seeds*

Composition	ASTA Std
Moisture (g)	8.0
Ash (g)	4.6
Energy (Kcal)	400.0
Protein (g)	10.0
Fat (g)	10.2
Carbohydrates (g)	66.5
Phosphorus (mg)	160.0
Calicium (g)	0.4
Sodium (mg)	10.0
Potassium (mg)	1200
Iron (mg)	17.0
Volatile oil (%)	2.0-5.0
Piperine (%)	2.0-8.0
Oleoresin (%)	6.0-13.0%
Vitamins (mg/100g)	
Vitamin A	19.0
Niacin	0.8
Riboflavin	0.21
Thiamine	0.07

Flavor profile

The volatile oil is commercially extracted from the dried berries. In the oils, monoterpene hydrocarbons ranged from 69.4 to 85%, sesquiterpene hydrocarbons from 15 to 27.6% and the rest was oxygenated constituents. The major monoterpene hydrocarbons, e.g. α -pinene, ranged from 5.9 to 12.8%, β -pinene from 10.6 to 35.5% and limonene from 22 to 31.1%. The major sesquiterpene hydrocarbon, caryophyllene, ranged from 10.3 to 22.4%. The pungency of black pepper (*Piper nigrum* L.) was attributed to the presence of piperine only, the structure of which is *trans, trans-5-(3,4-methylenedi-* oxyphenyl)-2,4-pentadienoic acid piperidide.

- The major medicinal properties of essential oil are antiseptic, carminative, digestive, diuretic, stimulant, stomachic, tonic and anti-spasmodic, antimicrobial and anti-inflammatory activities.
- Black pepper is widely used in Indian cooking for flavouring food and as carminative. It is an essential ingredient in garam masala.

5.2.2. Targetted market (s): Domestic or International. In case of International market, the applicant has to refer APEDA export requirements and should specify compliance appropriately within 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

Year	Area in (000ha)	Production (000 MT)	Productivity (Kg/Ha)
2012-13	125	53	424
2013-14	124	51	411
2014-15	126	65	516
2015-16	129	55	426
2016-17	134	57	425

2. State wise picture- Top 10 producing states

State	Area in ha	Production MT	Productivity kg/ha
Karnataka	37750	35000	927
Kerala	86740	22000	254
Tamil Nadu	4360	2000	459
All India	135920	64000	471

3. Project State Picture (Mandatory)

Year	Area	Production	States'	Yield	Gap in Productivity (kg/I		v (kg/Ha)
	(ha)	MT	contribution	kg/ha	State	National	Global
			to Nation		Av.	Av	Highest
Kerala							
2015-16	85948	21000	43.3	244	244	368	2646
2016-17	85210	20000	35.1	235	235	424	2606
2017-18	86740	22000	34.3	254	254	471	2670
Average	85966	21000	37.1	244	244	422	2640
Karnataka							
2015-16	34990	23000	47.4	657	657	368	2646
2016-17	37750	31000	54.4	821	821	424	2606
2017-18	37750	35000	54.7	927	927	471	2670
Average	36730	29667	52.5	806	806	422	2640
Tamil Nadu	1						
2015-16	4349	1500	3.1	345	345	368	2646

2016-17	4910	2000	3.5	407	407	424	2606
2017-18	4360	2000	3.1	459	459	471	2670
Average	4540	1833	3.2	404	404	422	2640

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

Area			Production			Productivity		
District	Area	% of	District	Production	% of State	District	Productivity	Ranking
	(ha)	State		(Tonnes)	Production		(Kg/Ha)	
		Area						
			Thiruvanan			Thiruvanan		6
Thiruvananthapuram	2177	2.55	thapuram	846	2.48	thapuram	389	
Kollam	3180	3.73	Kollam	898	2.64	Kollam	282	9
			Pathanamt			Pathanamt		7
Pathanamthitta	1683	1.98	hitta	537	1.58	hitta	319	
Alappuzha	605	0.71	Alappuzha	135	0.40	Alappuzha	223	13
Kottayam	3248	3.81	Kottayam	1012	2.97	Kottayam	312	8
Idukki	43790	51.39	Idukki	18726	54.97	Idukki	428	3
Ernakulam	1866	2.19	Ernakulam	467	1.37	Ernakulam	250	12
Thrissur	1901	2.23	Thrissur	480	1.41	Thrissur	252	11
Palakkad	2488	2.92	Palakkad	1000	2.94	Palakkad	402	4
			Malappura			Malappura		14
Malappuram	2641	3.10	m	584	1.71	m	221	
Kozhikode	3755	4.41	Kozhikode	1059	3.11	Kozhikode	282	10
Wayanad	10565	12.40	Wayanad	4136	12.14	Wayanad	391	5
Kannur	4394	5.16	Kannur	2447	7.18	Kannur	557	2
Kasaragode	2914	3.42	Kasaragode	1738	5.10	Kasaragode	596	1
State Total	85207		State Total	34065		State Total	400	

Note: Project state as selected Kerala, Year 2016-17 Source: Department of Economics & Statistics, Kerala

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

District	Item	2016-17	2015-16	2014-15
Thiruvananthapuram	Area (Ha)	2177	2293	2401
	Production (Tonnes)	846	972	916
	Productivity (Kg/HA)	389	424	382
Kollam	Area (Ha)	3180	3330	3244
	Production (Tonnes)	898	1093	1195
	Productivity (Kg/HA)	282	328	368
Pathanamthitta	Area (Ha)	1683	1707	1661
	Production (Tonnes)	537	599	705
	Productivity (Kg/HA)	319	351	424
Alappuzha	Area (Ha)	605	616	614
	Production (Tonnes)	135	134	147
	Productivity (Kg/HA)	223	218	239
Kottayam	Area (Ha)	3248	3215	3135
	Production (Tonnes)	1012	1150	1078

	Productivity (Kg/HA)	312	358	344
Idukki	Area (Ha)	43790	42694	43852
	Production (Tonnes)	18726	25495	23916
	Productivity (Kg/HA)	428	597	545
Eranakulam	Area (Ha)	1866	1867	1913
	Production (Tonnes)	467	527	539
	Productivity (Kg/HA)	250	282	282
Thrissur	Area (Ha)	1901	1790	1801
	Production (Tonnes)	480	479	502
	Productivity (Kg/HA)	252	268	279
Palakkad	Area (Ha)	2488	2510	2695
	Production (Tonnes)	1000	954	969
	Productivity (Kg/HA)	402	380	360
Malappuram	Area (Ha)	2641	2938	2913
	Production (Tonnes)	584	460	650
	Productivity (Kg/HA)	221	157	223
Kozhikode	Area (Ha)	3755	3474	3428
	Production (Tonnes)	1059	934	1056
	Productivity (Kg/HA)	282	269	308
Wayanad	Area (Ha)	10565	12498	10064
	Production (Tonnes)	4136	6593	4794
	Productivity (Kg/HA)	391	528	476
Kannur	Area (Ha)	4394	4269	4626
	Production (Tonnes)	2447	1553	2146
	Productivity (Kg/HA)	557	364	464
Kasaragod	Area (Ha)	2914	2747	3084
	Production (Tonnes)	1738	1189	2077
	Productivity (Kg/HA)	596	433	673
State Total	Area (Ha)	85207	85948	85431
	Production (Tonnes)	34065	42132	40690
	Productivity (Kg/HA)	400	490	476

Source: Department of Economics & Statistics, Kerala

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

Сгор	Ar	ea	Produ	uction
	Ha (000) %		Tonnes (000)	%
Black Pepper	134	3.32	57	0.66
Cardamom	96	2.38	24	0.28
Total	4031	100	8610	100

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

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

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

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

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

Demand -Supply gap for the commodity

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

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

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

5.2.6. Global producers- Country, Area, Production, Productivity and global market share

The cropped area under black pepper in the world is about 4.76 lakh ha with a production of 4.13 lakh tons during 2016. India has the largest area under black pepper (1.83 lakh ha) followed by Indonesia (1.45 lakh ha), Vietnam (50,000 ha), Sri Lanka (30,700 ha), Brazil (20,000 ha), and Malaysia (15,000 ha) with a production of 64.0, 69, 158, 32.7, 43 and 24.5 thousand tons in 2016, respectively (www.ipcnet.org/n/statpdf). Together the IPC member countries produce about 80% of the world production of black pepper and accounts for about 90% of the world pepper export. In view of the high density planting and more intensive cultivation, productivity of pepper in Madagascar is the highest (2,437 kg ha⁻¹) followed by Vietnam (1,760 kg ha⁻¹), Brazil (1,600 kg ha⁻¹) and Malaysia (1,095 kg ha⁻¹). The major consuming countries are Middle Eastern Countries, India, Pakistan, European countries, US, and Japan.

5.2.7. International trade market and potential:

(collect from APEDA Agri-exchange website at <u>http://agriexchange.apeda.gov.in/;</u> including product profile, statistics and market intelligence sites esp. International trade and Global Analytical report in brief to the extent of relevance; may also refer DGCIS site<u>http://www.dgciskol.gov.in/</u>for more information)

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

Seasonality matrix of the crop with reference to black pepper

Spices	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Kerala												
Karnataka												
Tamil Nadu												
	0											

Lean Season

Peak Season

5.2.9 Price variation of Commodities at State / UT Capital or at a Major Fruit & Vegetables Market

	Local	Local Market: 1 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: 0	00Ton	S	
	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

Black pepper, matured dehydrated green pepper and tender green pepper are processed for various end products. Various products prepared are as follows.

Green pepper based products: Canned green pepper, Green pepper in brine, Bulk-packaged green pepper in brine, Cured green pepper, Frozen green pepper, Freeze dried green pepper, Dehydrated green pepper, Green pepper pickle, Mixed green pepper pickle, Green pepper sauce and Green pepper-flavoured products.

Black pepper based products: Whole black pepper, Sterilized black pepper, Ground black pepper, Cryoground black pepper powder, Pepper oil, Oleoresin, Microencapsulated spice flavour.

White pepper based products: White pepper whole, White pepper powder.

Miscellaneous products: Curry powder-spice blends, Pepper-flavoured products, Pepper extract preservative, pepper oil, Pepper oleoresin, Lemon pepper, Garlic pepper, Sauces, Paste *etc*.

Pepper byproducts: Light pepper, Pepper hulls, Pepper pin heads.

Pepper flavoured products: Pepper mayonnaise, Pepper tofu, Pepper cookies, candy and perfumes.

Aroma

The aroma of black pepper is mainly contributed by the volatile oil which varies between 2-5% in the berries. Produced by steam distillation, from the black peppercorns, the essential oil is water-white to pale olive in colour with a warm, spicy (peppery), fresh aroma. It has a middle note and blends well with rose, rosemary, marjoram, frankincense, olibanum, sandalwood, and lavender; however it should only be used in small amounts.

5.2.13.Central and State Government policies to promote the commodity: (towards its promotion, area expansion and organised marketing, processing and export).

$5.2.14. \ensuremath{\textbf{Value chain in the commodity}}$

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

5.3. Financial Viability of the Project:

5.5.1	. Due Dengenee Status		
	Date of Pre-Sanction / Due Deligience		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	Yes/No	
	b) RBI willfull defaulter list	Yes/No	
	c) ECGC SA list	Yes/No	
4	a)Verfication of CERSAI (Central	Yes/No	
	Registry of Securitisation Asset	Yes/No	
	Reconstruction and Security Interest)		
	b) In case of company whether		
	financial data verfied with ROC.		

5.3.1: Due Deligence Status

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

Scheme Component	Items	Sub- items	Capacity/ Area/	Units/ Numbers	unit cost	Cost
			spacing Etc.			
Open field	Cultivation	Planting material				
Cultivation	Expenses	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	Functional pack				
	Infrastructure	house				
		Store & Pump				
		house (Area in				
		sq.ft with size)				
		Labour room & go				

		down (Area in				
		So ft with size)				
		Others				
	Earm	Tractor unto 20				
	Machanisation					
			IID			
	(AC)	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	Soil levelling /				
	Development	Digging/Fencing				
	_	etc.				
		Others if any				
	Land if newly pu	urchased 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 Agricultur	al Practices (GAP)				
	including infrast	ructure (AC)				
	Plastic Mulching					
	Others					
	Grand Total					
Sahama			Conscitut	Linita/	Likoly	NUD
Scheme				Numbor	/Unit	Norm
			Alea/ Specing	Number	/Unit	NOTII
			spacing		cost	
Integrated	1 Integrated DU	М	eic.			
DUM	3 1 Deck House	111				
F I IIVI	2.2 Integrated Dec	le house				
	2.2 Dra agaliar					
	3.3.Pre-cooling un					
	3.4.Cold Room (S	taging)				
	5.5.Mobile Pre-co	oling unit				
	3.6.Ripening Chai	mber				
	3.7 Primary Proce	ssing				
	3.8.Retail outlet					
	Others					

Summary of Project Cost

		Project Cost	Max.possible NHB support (self-
			appraisal)
3. Open field condition	With add on components		
	Without add on components		
4. Integrated PHM			
3.1.Integrated Pack House			
3.2.Pack house			
3.3.Pre-cooling unit			
3.4. Cold Room (Staging)			
3.5. Mobile Pre-cooling unit			
3.6.Ripening Chamber			
3.7 Primary Processing			
3.8.Refer Van			
3.9 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. A 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.Investiment in Horticulture Sector

FINANCIAL INDICATORS	Estima	ted projec	ctions					
	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								

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

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 cap	pacity utilization	on by 10%.		
Case II	Decrease in Sal	les by 10%.			
Case III	Increase in Rav	v Material Cos	t by 10%		
	Base Case	Case I	Ca	se II	Case III
PBIDT					
PBT					
PAT					
Min DSCR					
Max DSCR					
Overall					
DSCR					

S1.	Ratio	Benchmark	As calculated by Project Finance Expert				
No.							
			1 st yr	$2^{nd}yr$	3 rd yr	4 th yr	5 th Yr
1.	Current Ratio	1.25:1					
	other than export						
	units						
2.	CR-Export units	1.10:1					
3	IRR /BCR						
4	DSCR*	1.50:1					
5	Average DSCR						
6	Debt to Equity	3:1					
	Ratio i.e DER						
7	TOL/TNW	4:1					
8	Promoters	25%					
	Contribution	minimum					
9	Break Even Point	Lower the					
		% is better					
10	Security	More than					
	Coverage Ratio	100% of					
		Loan					
		Amount					
11	Repayment	Up to 7					
	period	Years					
		excluding					
		moratorium,					
		but not to					
		exceed an					
		overall					
		tenor of 10					
		years					

5.3.14 Key Financial Parameters for the proposal:

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

1. Immovable Assets

				(R	s. 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	Date of	Face value	Market value
	Company/Institutions	purchase		

5. Investment in business & other associates concern

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

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	Management
Excess production / Glut situation in	
Market	
Crop failure	Crop insurance
Price volatility-low prices	
Pests and Diseases	
Natural calamities- fire, cyclone, Floods	
etc.	

Farm record keeping/ Maintenance proposed

5.4: Land development and Crop husbandry

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

Black pepper is a plant of humid tropics requiring high rainfall and humidity. The hot and humid climate of sub mountainous tracts of Western Ghats is ideal for its cultivation. It grows successfully between 20° North and South latitude, and from sea level up to 1500 m above sea level. The crop tolerates temperatures between 10° and 40°C. The ideal temperature is 23 - 32°C with an average of 28°C. Optimum soil temperature for root growth is 26 - 28°C. A well distributed annual rainfall of 125-200 cm is considered ideal for black pepper. Black pepper can be grown in a wide range of soils with a pH of 4.5 to 6.5, though in its natural habitat it thrives well in red laterite soils.

Sites with slight to moderate slope are ideal for pepper cultivation, since it would ensure good drainage. Slopes facing south west are to be avoided as far as possible.

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

Variety	Features	
PRS, KAU, Panniyur		
Panniyur -1	High yielding, not suited to heavily	
	shaded areas	
Panniyur -2	Shade tolerant	
Panniyur -3	Late maturing	
Panniyur -4	Stable yielder	
Panniyur -5	Tolerant to shade	
Panniyur -6	Suited to all black pepper tracts	
Panniyur -7	Suited to all black pepper tracts	
Panniyur -8	High yielding, field tolerant to	
	Phytophthora foot rot and drought	
ICAR-IISR,		
Kozhikode		
Subhakara	Suited to all black pepper tracts	
Sreekara	Suited to all black pepper tracts	
Panchami	Late maturing	
Pournami	Tolerant to root knot nematode	
PLD -2	Suited to Thiruvananthapuram and	
	Kollam districts of Kerala	
IISR Shakthi	Tolerant to Phytophthora foot rot.	
IISR Thevam	Tolerant to Phytophthora foot rot;	
	Suited to high altitudes and plains	
IISR Girimunda	Suited to high altitudes	
IISR Malabar Excel	Suited to high altitudes; Rich in	
	oleoresin	

Classifica	tion of cultivars based on crop		
maturity			
a.	Early		
b.	Mid		
С.	Late	Panchami, Panniyur-3	
Classifica	Classification of cultivars / Varieties/		
Hybrids b	ased on purpose		
a.	Tolerant to Phytophthora	IISR Thevam, IISR Shakti	
	foot rot		
b.	Tolerant to Nematodes	Pournami	
С.	High oil type		
d.	Shade tolerant	Panniyur-5, 2, Sreekara	

Method of Propagation / technology

Method recommended by ICAR /	Vegetative propagation (by rooted
CAU/SAU/SHU	cuttings)
Proposed method under the project	Serpentine layering
Do's and Don't's proposed / taken in	
propagation	
Expert guiding the project	

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

Planting material-source, quality and suitability

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

5.4.3. Orchard planning Lay out and management / Planting

5.4.3.1. Black pepper establishment and layout systems

As recommended by	
ICAR Institute/	
CAU/SAU/SHU/	
Others	
Action taken / proposed	
by the applicant	
Points of Deviation if	
any and justification	

5.4.3.2.Land preparation

As recommended by	With the receipt of first rains in May-June, primary stem cuttings of
ICAR Institute/	standard trees such as Erythrina spp., Garuga pinnata, Grevillea
CAU/SAU/SHU/	robusta(silver oak), seedlings of Alianthus malabarica (Matti) are
Others	planted in pits of 50 cm \times 50 cm \times 50 cm size filled with cow dung and
	top soil. The planting is done at a spacing of $3 \text{ m} \times 3 \text{ m}$ which would
	accommodate about 1110 standards per hectare. The black pepper vines
	can be trailed on the standards after three years when they attain
	sufficient height.
	When E. indica and G. Pinnata are used, the primary stems are cut in
	March/April and stacked in shade till the stems start sprouting in May.
	The pits are filled with a mixture of top soil, farmyard manure @
	5 kg/pit and 150 g rock phosphate. Neem cake @ 1 kg,
	Trichoderma harzianum @ 50 g also may also be mixed with the
	mixture at the time of planting.
Action taken /	

proposed by the applicant	
Points of Deviation if	
any and justification	

5.4.3.3.Planting Season / time and density

	Recommended @	Proposed	Remarks in case of deviation
Planting Season /	May-June		
Time			
Spacing	3 m x 3 m on plain lands and 2 m between plants in rows across the slope and 4 m between rows on sloppy lands.		
Seed/ seedling rate/	1100 standards per ha		
Density per ha			
Seed / Planting	Top soil, farmyard		
Material treatment	manure @ 5 kg/pit and		
	150 g rock phosphate.		
	Neem cake @ 1 kg,		
	Trichoderma		
	harzianum @ 50 g		
Depth of sowing	Pits of 50 cubic		
	centimeters		
Seedling/	Runner shoots from		
Transplanting age	mother plants of age		
	group 5-12 years.		
	The cuttings with 3 to 4		
	leaves of 3 to 4 months		
	old would be ready for		
	planting in May-June		

@: Black pepper - Extension Pamphlet by ICAR-IISR, Kozhikode; 2015; http://spices.res.in/current-extension-pamphlets

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

5.4.3.4. Water and Nutrient Management

1. Water requirements, Source and irrigation methods&

a. Critical stages for Irrigation and Water required under Drip Irrigation

Critical Stages	Recommendation	Proposed practice	Remarks
Provide irrigation	Normally black		
during summer	pepper is grown as a		
	rainfed crop. Drip		
	irrigation 7 litre per		
	vine per day between		
	October to March		
	recorded higher fresh		
	yield per vine.		
Housing the			
cuttings for about			
20 days in a moist			
chamber covered			
on all sides with			
transparent			
polythene would			
ensure higher			
percentage of			
sprouting and			
better			
establishment.			

b. Method of Irrigation:

Methods		Recommendation	Proposed practice	Remarks
Normal irrigation	hose	Vines are irrigated at the basin through hose and 50 litres per vine is recommended (15 years and above). This can be reduced to 40 litres per vine for 11-15 years age group and 30 litres for		

	vines aged between 5 - 10 years. The spiking will be uniform in the irrigated crop as most of	
	the spikes (> 90%) emerge by July while in rain fed crop only around 60% of spikes	
	emerge in July and may extend till September	
drip irrigation	Drip irrigation 7 litre per vine per day between October to March recorded higher fresh yield per vine.	

c. <u>Water source, demand and availability</u>

2. Nutrient management—Manure, Bio-/ Chemical fertilizers including micro nutrients:/ Fertigation. Dosage and method and time of application for efficacy, food safety and environment sustainability.

A	
As recommended by	Application of lime or dolomite @ 500 g/vine in April-May
ICAR Institute/	during alternate years is recommended under highly acid soil
CAU/SAU/SHU/ Others	conditions. Organic manures in the form of cattle manure or
	compost can be given @ 10 kg/vine during May. Neem cake @ 1
	kg/vine can also be applied.
	As the soil fertility will be varying with the agro ecological
	conditions or management systems, site specific nutrient
	management for yielding gardens based on their soil test results
	for major nutrient is advocated. Only one-third of this dosage
	should be applied during the first year which is increased to two-
	thirds in the second year. Only one-third of this dosage should be
	applied during the first year which is increased to two-thirds in the
	second year. The full dose is given from the third year onwards.
	The fertilizers are to be applied in two split doses, one in May-
	June and the other in August-September and sufficient soil
	moisture must be ensured. Care should be taken to avoid direct
	contact of fertilizers with roots of black pepper.
	Foliar application of micronutrient mixture specific to black
	pepper is also recommended (dosage @ 5 g/L) twice, starting at
	flowering and followed at monthly intervals for higher yield.
	(Mention source of publication with date/Year)
	Provide reliable good web links or mention any publication for
	additional reading or for more information.
Action taken / proposed	ž
by the applicant	
Points of Deviation if	
any and justification	

Soil test value for available	Fertilizer nutrient	
nutrients (kg/ha) recommended (kg/ha)		ed (kg/ha) for
	yield	targets
	3.0 t/ha	6.0 t/ha
Nitrogen		
< 150	50	100
150-250	25	80
250-400	10	55
>400	-	20
Phosphorus (P ₂ O ₅)		
< 10	40	80
10-30	30	70
30-50	10	55
>50	-	30
Potassium (K ₂ O)		
< 110	150	310
110-300	125	275
300-500	80	250
>500	35	110

Soil test based fertilizer recommendations for dry yield target levels of 3 and 6 tonnes/ha

Availability of Water and Nutrient management plan: Yes/ No

5.4.3.5.Intercultural operations including Weed management

As	As the plants grow, shoots are tied to the standard as often as required.
recommended by	The young vines should be protected from hot sun during summer by
ICAR Institute/	providing artificial shade. Regulation of shade by lopping the branches
CAU/SAU/SHU/	of standards is necessary not only for providing optimum light to the
Others	vines but also for enabling the standards to grow straight. Adequate
	mulch with green leaf or organic matter should be applied towards the
	end of north east monsoon. The base of the vines should not be
	disturbed to avoid root damage.
Action taken /	Shade lopping may be done twice (during June and September) in a
proposed by the	year. Excessive shading during flowering and fruiting encourages pest
applicant	infestations.
	Growing cover crops like Calapogonium mucunoides and Mimosa
	invisa are also recommended under West Coast conditions as an
	effective soil cover to prevent soil erosion during rainy season. During
	summer the cover crops dry up leaving thick organic mulch.
Points of	(Black pepper - Extension Pamphlet by ICAR-IISR, Kozhikode;
Deviation if any	2015)
and justification	http://spices.res.in/current-extension-pamphlets

5.4.3.6. Plant canopy architecture management/ training and pruning

As recommended by	

ICAR Institute/	
CAU/SAU/SHU/ Others	
Action taken / proposed	
by the applicant	
Points of Deviation if	
any and justification	

5.4.3.7. Use of Pollinators & Pollinizers

Item	Recommended	Proposed	Remarks
No.of Hives			
Name of Pollinisers			
No.of Pollinisers			

5.4.3.9. Flowering& Fruiting

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

As recommended by	A majority of the cultivated black pepper vines are bisexual and
ICAR Institute/	the percentage of bisexual flowers ranges from 85 to 99 in the
CAU/SAU/SHU/ Others	improved varieties. The vine flowers during May-June after the
	receipt of a few pre-monsoon rains and in localities where South
	West Monsoon rains less, the vine may flower with the North East
	monsoon rains. If rains fail, irrigating the crop will help in spike
	emergence. The fruit is small, usually globular green berry turning
	to red or orange red when ripe and matures in six t seven months
	after flowering.
	(Mention source of publication with date/Year)
	Provide reliable good web links or mention any publication for
	additional reading or for more information.
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

As recommended by	1. Fungal diseases and Management
ICAR Institute/	Foot rot disease
CAU/SAU/SHU/	Foot rot (quick wilt disease) caused by Phytophthora capsici is
Others	the most destructive of all diseases and occurs mainly during the
	south west monsoon season. All parts of the vine are vulnerable to
	the disease and the expression of symptoms depend upon the site
	or plant part infected and the extent of damage.

Symptoms

- One or more black spots appear on the leaves which have characteristic fine fimbriate margins which rapidly enlarge and cause defoliation.
- The tender leaves and succulent shoot tips of freshly emerging runner shoots trailing on the soil turn black when infected. The disease spreads to the entire vine from these infected runner shoots and leaves during intermittent showers due to rain splash.
- If the main stem at the ground level or the collar is damaged, the entire vine wilts followed by shedding of leaves and spikes with or without black spots. The branches break up at nodes and the entire vine collapses within a month.
- If the damage is confined to the feeder roots, the expression of symptoms is delayed till the cessation of rain and the vine starts showing declining symptoms such as yellowing, wilting, defoliation and drying up of a part of the vine. This may occur during October-November onwards. These vines may recover later and survive for more than two seasons till the root infection culminates in collar rot and death of the vine.

Management

The disease can be controlled by adopting integrated disease management strategies.

Phytosanitation

- Removal and destruction of dead vines along with root system from the garden is essential as this reduces the buildup of inoculum (*Phytophthora* population).
- Planting material must be collected from disease free gardens and the nursery preferably raised in fumigated or solarized soil.

Cultural practices

- Adequate drainage should be provided to reduce water stagnation.
- Injury to the root system due to cultural practices such as digging should be avoided.
- The freshly emerging runner shoots should not be allowed to trail on the ground. They must either be tied back to the standard or pruned off.
- The branches of support trees must be pruned at the onset of monsoon to avoid build up of humidity and for better penetration of sunlight. Reduced humidity and presence of sunlight reduces the intensity of leaf infection.

Chemical/ Biological control
Any one of the following control measures can be adopted.
 After the receipt of a few monsoon showers (May-June), all the vines are to be drenched at a radius of 45-50 cm with copper oxychloride (0.2%) @ 5-10 litres/vine. A foliar spray with bordeaux mixture (1%) is also to be given. Drenching and spraying are to be repeated once again during August-September. A third round of drenching may be given during October if the monsoon is prolonged. After the receipt of a few monsoon showers, all the vines are to be drenched with potassium phosphonate (0.3%) @ 5-10 litres/vine. A foliar spray with potassium phosphonate (0.3%) is also to be given. A second drenching and spraying with potassium phosphonate (0.3%) is to be repeated during August-September. If the monsoon is prolonged, a third round of drenching may also be given during October. After the receipt of a few monsoon showers, all the vines are to be drenched with metalaxyl mancozeb (0.125%) @5-10 litres/vine. A foliar spray with metalaxyl mancozeb (0.125%) may also be given. At the onset of monsoon (May-June), apply <i>Trichoderma harzianum</i> around the base of the vine @50 g/vine (this quantity is recommended for a substrate containing <i>Trichoderma harzianum</i> @ 10¹⁰ cfu/g). A foliar spray with potassium phosphonate (0.3%) or Bordeaux mixture (1%) or potas
August-September.
Pollu disease (Anthracnose) This disease is caused by <i>Colletotrichum gloeosporioides</i> . It can be distinguished from the pollu (hollow berry) caused by the beetle by the presence of characteristic cracks on the infected berries. The disease appears towards the end of the monsoon. The affected berries show brown sunken patches during early stages and their further development is affected. In later stages, the discolouration gradually increases and the berries show the characteristic cross splitting, turn black and dry. The fungus also causes angular to irregular brownish lesions with a chlorotic halo on the leaves. The disease can be controlled by spraying bordeaux mixture (1%) or carbendazim (0.2%).
2. Bacterial diseases and Management
<i>Stunt disease</i>
The vines exhibit shortening of internodes to varying degrees. The
leaves become small and narrow with varying degrees of

deformation and appear leathery, puckered and crinkled. Chlorotic spots and streaks also appear on the leaves occasionally. The yield of the affected vines decreases gradually. Two viruses namely <i>Cucumber mosaic virus</i> and a <i>Badnavirus</i> are associated with the disease. The major means of spread of the virus is through the use of infected stem cuttings. The disease can also be transmitted through insects like aphids and mealy bugs. The following strategies are recommended for the management of the disease.
 Use virus free healthy planting material Regular inspection and removal of infected plants; the removed plants may be burnt or buried deep in soil Insects such as aphids and mealy bugs on the plant or standards should be controlled with insecticide spray such as dimethoate (0.05%).
 4. Phytoplasma diseases and Management <i>Phyllody disease</i> This disease which is caused by phytoplasma is noticed in parts of Waynad and Kozhikode districts of Kerala. The affected vines exhibit varying stages of malformation of spikes. Some of the floral buds are transformed into narrow leaf like structures. Such malformed spikes show leafy structures instead of floral buds, exhibiting phyllody symptoms. In advanced stages, the leaves become small and chlorotic, and the internodes are also shortened. The affected fruiting laterals give a witches broom appearance. Severely affected vines become unproductive. In severely affected vines the entire spike is converted into small branches which appear chlorotic and the vines decline rapidly. The infected vine become unproductive within 2 to 3 years.
becomes unproductive within 2 to 3 years. The infected vines are to be destroyed to prevent the further spread of the disease. 5. Pests and Management Pollu beetle The pollu beetle (<i>Longitarsus nigripennis</i>) is the most destructive pest of black pepper and is more serious in plains and at altitudes below 300 m. The adult beetles feed and damage tender leaves and spikes. The grubs bore into and feed on the internal tissues and the infested spikes turn black and decay. The pest infestation is more serious in shaded areas in the plantation. The pest population is higher during September-October in the field. Shade lopping in the plantation reduces the population of the pest in the field. Spraying quinalphos (0.05%) during June-July and September-October or quinalphos (0.05%) during July and Neemgold (0.6%) (neem-based insecticide) during August, September and October is effective for the management of the pest.
The top shoot borer (<i>Cydia hemidoxa</i>) is a serious pest in younger plantations in all black pepper areas. The larvae bore into tender terminal shoots and feed on internal tissues resulting in

blackening and decaying of affected shoots. The pest infestation is higher during July to October when numerous succulent shoots are available in the vines. Spray quinalphos (0.05%) on tender terminal shoots; repeat spraying at monthly intervals (during July-October) to protect emerging new shoots.

Leaf gall thrips

Infestation by leaf gall thrips (*Liothrips karnyi*) is more serious at higher altitudes especially in younger vines and also in nurseries in the plains. The feeding activity of thrips on leaves causes the leaf margins to curl downwards and inwards resulting in the formation of marginal leaf galls. In severe cases of infestation, the growth of younger vines and cuttings in the nursery is affected. Spray dimethoate (0.05%) during emergence of new flushes in young vines in the field and cuttings in the nursery.

Scale insects

Among the various scale insects recorded on black pepper, mussel scale (*Lepidosaphes piperis*) and coconut scale (*Aspidiotus destructor*) causes serious damage to black pepper vines at higher altitudes and also to older cuttings in nurseries in the plains. Scale insects are sedentary, remaining permanently fixed to plant parts and appear as encrustations on stems, leaves and berries. They feed on plant sap and cause yellowing and wilting of infested portions; in severe cases of infestation the affected portions of vines dry up. The pest infestation is more severe during the post monsoon and summer periods.

Clip off and destroy severely infested branches. Spray dimethoate (0.1%) on affected vines after harvest of produce; repeat spraying after 21 days to control the infestation completely. Initiate control measures during early stages of pest infestation. In nurseries spraying neem oil 0.3% or Neemgold 0.3% or fish oil rosin 3% is also effective in controlling the pest infestation.

6. Nematodes and management

Slow decline (slow wilt)

Slow decline is a debilitating disease of black pepper. Foliar yellowing, defoliation and die-back are the aerial symptoms of this disease due to infestation by plant parasitic nematodes. The diseased vines exhibit foliar yellowing from October onwards coinciding with depletion of soil moisture. The affected vines show varying degrees of feeder root loss and the expression of symptoms on the aerial parts occur after a considerable portion of the feeder roots are lost. The root system of affected vines show leasions/ root galls due to infestation by plant parasitic nematodes such as *Radopholus similis* and *Meloidogyne incognita* leading to rotting of feeder roots. There is no spatial segregation of plant parasitic nematodes and *P. capsici* in the soil under field conditions. Hence, it is necessary to adopt a combination of

	fungicide and nematicide application for the management of the
	disease.
	 Severely affected vines recovery should be removed from the plantation and destroyed, as it is impossible to record them whenever high population of nematode are noticed The pits for planting should be treated with carbosulfan @1 per L of water at the time of planting Nematode free rooted cuttings raised in fumigated or steam sterilized nursery mixture should be used for planting in the field.
	• Carbosulfan (@1 ml/L water) should be drenched (3-5 L/ vine) during May/June (with the onset of south west monsoon) and September/October. Along with nematicides the basins should be drenched with either copper oxychloride (0.2%) or potassium phosphonate (0.3%) or metalaxyl-mancozeb (0.125%).
	In areas severely infested with root knot nematodes, cuttings of the resistant variety 'Pournami' may be planted. Biocontrol agents like <i>Pochonia chlamydosporia</i> or <i>Trichoderma harzianum</i> can be applied @ 50 g/vine twice a year (during April-May and September-October). The fungus load in the substrate should be 10^8 cfu/g.
	7. Pesticide residue management (including waiting period)
	(Mention source of publication with date/Year)
	Black Pepper extension pamphlet - http://spices.res.in/current- extension-pamphlets
Action taken / proposed by the applicant	
Points of Deviation if	
any and justification	

5.4.3.11. Physiological disorders- causes, preventive and management measures.

As recommended by	Spike chedding
As recommended by	Spike sheuung
ICAR Institute/	Spike shedding especially in varieties like Panniyur-1 at higher
CAU/SAU/SHU/ Others	elevations and is one of the emerging problem. It is seen in serious condition when the pre-monsoon showers are delayed and flowering and spiking occur during June-July. Heavy spike shedding may occur due to lack of pollination and anthracnose infection. Irrigation of vines from second fortnight of March coupled with prophylactic spraying with bordeaux mixture (1%) or carbendazim (0.2%) reduces the intensity of spike shedding.
Action taken / proposed	
by the applicant	
Points of Deviation if	
any and justification

5.4.5.Farm Structures and Farm Mechanisation

5.4.5.2. Farm Mechanisation

Available Machinery and equipment's / implements

Operations	Available Machinery and equipment's / implements	Proposed use	Justification
Weeding	Brush cutter	Weeding in the field	Less labour requirement and faster completion of weeding
Spraying	Power sprayer and Knapsack sprayer	Spraying of pesticides, insecticides and foliar fertilizers	For spraying
Threshers	Mechanical threshers	For separating the berries from the catkin	Helps in berry separation in hygienic way
Blanching	Boiling vessel and a filter	For hot water treatment	Helps for better colour development
Drying of Black pepper	Electrical/ conventional dryer	For drying of harvested produce	Dryer helps in easing the drying process and also enhancing the black colour of berries.
Cleaning & Grading	Spiral separator and Grader	Cleaning of debris and Grading of dried berries based on size	Helps in cleaning from debris and sorting good size capsules

5.4.6. Harvesting and Fruit / Flower care management

5.4.6.1. Harvesting season- Across India

State/UT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Kerala												
Tamil Nadu												
Karnataka												

5.4.6.2. Harvesting season- Across the project state /UT

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

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

Product	Stage maturity at harvest
Canned pepper	4-5 months
Dehydrated green pepper	10-15 days before maturity
Oleoresin and essential oil	15-20 days before maturity
Black pepper	Fully mature and 1-2 berries start turning from yellow to
	red in each spike
Pepper powder	Fully mature with maximum starch
White pepper	Fully ripe

5.4.6.4. Harvesting technology and Fruit care management

Global best practices	(Mention source of publication with date/Year)
As recommended by ICAR Institute/ CAU/SAU/SHU	Black pepper takes about 7-8 months after flowering to reach full maturity. In India the crop is harvested during December –January in plains and January-April in the high ranges of Western Ghats. It is important to harvest pepper at the proper stage of maturity in order to achieve a dried product of good colour and appearance. Harvest starts when one or two berries turn yellow. Spikes which are fallen on to the ground may be collected separately, cleaned and then pooled to the general lot. Pepper has moisture content of 65% to 70% at harvest, which should be brought to safer levels of 10% by adequate drying.
Relevant Photographs	

if any	
Action taken /	
proposed by the	
applicant	
Points of Deviation if	
any and justification	

5.5. **Post-Harvest Management**

5.5.1. Post-Harvest infrastructure scenario in horticulture sector in the State and specially for the proposed crop / component

5.5.2. Product / Process Flow chart- Illustrative (It should be crop and project specific)



5.5.3. Lay out/Floor plan of post harvest operations

- 1. Arrival Area
- 2. Sorting
- 3. De-sapping/De-latexing
- 4. De-handing
- 5. Cleaning / Washing
- 6. Grading
- 7. Pre-treatments (HW, waxing, chemical treatment, etc.)
- 8. Packing
- 9. Pre-cooling
- 10. Palletization
- 11. Cold Storage
- 12. Ripening/ De-greening
- 13. Transport

5.5.4. Post-harvest operations

1. Arrival Area

Activity	Recommended	Proposed practice	Remarks
Threshing	Threshing		
	The berries are separated from the spike usually by trampling. Mechanical threshers with capacities varying from 50 kg/h to 2500 kg/h are available which can thresh quickly and provide cleaner products.		
Blanching	The quality of the		
	black pepper can be		
	treatment of dipping		
	the mature berries		
	taken in perforated		
	vessel in boiling		
	before drying This		
	processing technique		
	has several		
	advantages:		
	• Uniform coloured		
	black pepper is		
	drving		
	• Reduces the		
	microbial load.		
	• Pepper can be		
	dried in 3-4 days		
	as against 5-6 days		
	following the		
	traditional practice		
	Removes the		
	extraneous		
	impurities like		
	dust from the		
	berries.		

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

Activity	Recommended	Proposed practice	Remarks

3. Curing / De-sapping/ De-latexing/ Any other intervention and protocols.

Activity	Recommended	Proposed practice	Remarks
Drying	Pepper has moisture content of 65% to 70% at harvest, which should be brought to safer levels of 10% by adequate drying		
	Sun drying is the conventional method		
	despiked berries are spread on concrete floor / bamboo mats/ PVC sheets and dried under		
	sun for 3-5 days to bring the moisture content below 10% Dried black pepper with high		
	moisture content (>12%) is susceptible to fungal attack Mycotoxins produced by the		
	fungal attack render the pepper unfit for human consumption. The average dry		
	recovery varies between 33-37 per cent depending on the varieties and cultivars		
	Mechanical driers are sometimes used to dry black pepper. Natural convection reverse air		
	flow mechanical drier are used by the farmers		
	sensitive products. Models of varying		
	capacities operated either electrically or by burning agricultural wastes can be used for		

4. Cleaning / Washing- manual/mechanised; model/make, size, capacity and protocols.

Activity	Recommended	Proposed	Remarks
		practice	
Cleaning and grading	The threshed and dried black pepper has extraneous matter like spent spikes, pinheads, stones, soil particles etc. mixed with it. Cleaning and grading are basic operations that enhance the value of the produce and help to get higher returns. Cleaning on a small scale is done by winnowing or spiral separator and hand picking which removes most of the impurities. Such units consist of a fan/ blower and a feeding assembly. The lighter fractions (dust, immature berries, pin heads and spent spikes) are blown away. Grading of black pepper is done by using sieves and sifting black pepper into different grades based on size.		

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

Activity	Recommended	Proposed practice	Remarks
Package	The graded produce is bulk packed separately in multi layer paper bags or woven polypropylene bags provided with food grade liners or in jute bags. The bags are arranged one over the other on wooden pallets after laying polypropylene sheets on the floor.		

6. Pre-treatments (HW, waxing, chemical treatment, etc.) and protocols.

Activity	Recommended	Proposed practice	Remarks

5.6	Marketing

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,

- 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

Potential for the processing of crop produce / commodity and facilities / infrastructure available

Processing product (s)	Infrastructure / Processing units available	Capacity	% capacity utilisation	Remarks

6	Technology providers

Γ

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

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:	
Post-Harvest	Name of PHM Expert	
Management		
Expert		
(Desirable)	Current profession:	
	Educational Qualification and	
	University passed out	
	Registration Number if any	
	Permanent Address:	
	Contact Number:	
Cold storage / Infra	Name of Expert	
Expert / Charter		
Engineer		
(Desirable)	Current profession:	

Educational Qualification and	
University passed out	
Registration Number if any	
Permanent Address:	
Contact Number:	
Name of Expert	
Current profession:	
Educational Qualification and	
University passed out	
Registration Number if any	
Permanent Address:	
Contact Number:	
Name of Expert	
Current profession:	
Educational Qualification and	
University passed out	
Registration Number if any	
Permanent Address:	
Contact Number:	
	Educational Qualification and University passed out Registration Number if any Permanent Address: Contact Number: Name of Expert Current profession: Educational Qualification and University passed out Registration Number if any Permanent Address: Contact Number: Name of Expert Current profession: Educational Qualification and University passed out Registration Number if any Permanent Address: Contact Number if any Permanent Address:

6.3.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
,		optional
	Whether the applicant proposes to undertake Good Agricultural	Yes/No
	Practices?	
	If Vac What have d / kind CAD Drawide details of brand	
	If Yes. what brand / kind GAP – Provide details of brand	
	Provide Certifying Agency details and contact person	
	Trovide Contrijing Agonej detans und 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
 Site selection Land or site for pepper cultivation should be selected on the basis of land history, previous manure applications and crop rotation. 	
 Manure handling and field application Livestock manure can be a valuable source of nutrients, but it also can be a source of human pathogens if not managed correctly. 	
 a) Proper and thorough composting of manure, incorporating it into soil prior to planting, and avoiding top-dressing of plants are important steps toward reducing the risk of microbial contamination. 	
3. Manure storage and sourcing	
a) Manure should be stored as far away as practical from areas where fresh produce is grown and handled.	
b) Physical barriers or wind barriers should be erected to prevent runoff and wind drift of manure.	
c) Manure should be actively compost so that high	

	temperature achieved by well-managed, aerobic compost can kill most harmful pathogens.	
4.	Timely application of manure Manure should be applied at the end of the season to all planned vegetable ground or fruit acreage, preferably when soils are warm, non-saturated, and cover-cropped. If manure is being applied at the start of a season, then the manure should be spread two weeks before planting, preferably to grain or forage crops.	
5.	Selection of appropriate crop Farmers should avoid growing root and leafy crops in the year that manure is applied to a Field. Manure should be applied to perennial crops in the planting year only. The long period between application and harvest will reduce the risks.	

7.2.2.Production Measures

1. Irrigation water quality	
Ideally, water used for irrigation or chemical spray	
should be free from pathogen. However, potable water	
or municipal water is not feasible for extensive use for	
crop production.	
a) Hence, surface water used for irrigation should be	
quarterly tested in laboratory for pathogen.	
b) Farmers can filter or use the settling ponds to	
improve water quality.	
c) Fruit and vegetable crops should not be side	
dressed with fresh or slurry manure. If side	
dressing is required, well composted or well-aged	
(greater than one year) manure should be used for	
the application.	
2. Irrigation methods	
a) Drip irrigation method should be used, whenever	
possible to reduce the risk of crop contamination	
because the edible parts of most crops are not	
wetted directly.	

	b)	Plant disease levels also may be reduced and water use efficiency is maximized with this method.	
3.	Field s	canitation and animal exclusion	
	a)	Farmers should stay out of wet fields to reduce the spread of plant or human pathogens.	
	b)	Tractors, plant, machinery and equipments that were used in manure handling should be cleaned prior to entering produce fields.	
	c)	Animals, including poultry or pets should not be allowed to roam in crop areas, especially close to harvest time.	
4.	Worke	er facilities and hygiene	
	a) Fa un per mo	rmers should get proper training to make them derstand the relationship between food safety and rsonal hygiene. These facilities should be onitored and enforced.	
	b) Ide ma far	eally, farm workers should be provided clean, well- aintained and hygienic toilet facilities around the ming 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 crops. Sick employees or those with contaminated hands can spread pathogens to produce. 	
b) Employee awareness, meaningful training and	

accessible restroom facilities with hand wash	
stations encourage good hygiene.	

7.2.4. Post-Harvest Handling

1.	Worke	r 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.	Monite	or wash water quality	
	a.	Potable water should be preferably used in all washing operations.	
	b.	Clean water should be maintained in dump tank by sanitizing and changing water regularly.	
	c.	Use chlorinated water and other labeled disinfectants to wash fresh produce.	
3.	Sanitiz	e 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-co	oling and cold storage	
	a.	After harvesting, fruits and vegetables should be quickly cooled to minimize the growth of pathogens and maintain good quality.	
	b.	Water bath temperature for cooling should not be more than 10F cooler than the produce pulp temperature.	
	c.	Refrigeration room should not be overloaded beyond cooling capacity.	
5.	Transp	portation 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 fresh fruits and vegetables are not shipped in trucks which have carried live animals or harmful substances.	
	c)	If these trucks must be used, they should be washed, rinsed, and sanitized them before transporting fresh produce.	
	d)	For traceability norms, it must be ensured that each package leaving the farm can be traced to field of origin and date of packing	

Source: TNAU

http://agritech.tnau.ac.in/gap_gmp_glp/gap_fresh%20_%20fruits%20&%20veg.html

8.Innovation if any

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

Check list for Detail Project Report (DPR)

		Mandatory	Document /	Tick
		Information	Evidence *	Mark
	Project at a Glance			
1	About the Applicant /Promoter			
2	Details of benefits availed by 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 /	\checkmark	Certified Land	
	Registration of lease/ map etc.		revenue	
			documents	
	4. Location of the Project- Identification			
	5. Current usage of land of proposed	\checkmark		
	Project Area			
	6. Current infrastructure and assets	\checkmark		
	possessed by the Applicant:			
	7. Lay out plan of the project		Lay out Plan	
	8. Conversion of Land Use (CLU)	\checkmark	Certificate	
			from	
			competent	
			authority	
	9. Whether project site is part of			
	production belt / cluster / hub			
	10. Rationale for the location of the	\checkmark		
	project	,		
	11. Compliance of project site for food	\checkmark		
	safety	,		
	12. Components / Activities of the	\checkmark		
	Project with justification	,		
	13. Operations planning			
	14. Month wise operational chart /	\checkmark		
	Implementation schedule	,		
	15. Backward and Forward linkages.			
	16. Manpower (Skilled & Unskilled	\checkmark		
	labour etc.) availability			ļ
	17. Infrastructure (Power, Fuel, Water,	\checkmark		
	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 pr	oject is		
	proposed with rationale / justification	on.		
5	Project details			
5.1	Agro-climatic suitability / feasibility	r		
	1. Origin			
	2. and distribution of crop in	the said		
	location and India and in the	e world		
	(briefly)			
	3. Agro-climatic / Horticultura	1 zones $$	IMD Data	
	and suitability of the crop (s)			
	4. Soil type and latest health-su	itability $$	Latest Soil	
	for the crop		health card	
			(not more than	
	5 Water (imigation) course and	:1.a.h:1:4.x	I month old)	
	5. Water (irrigation) source, avai	liability, N	Latest water	
	Quality and suitability		(not more then	
			(not more than 1 month old)	
52	Market viability			
5.2	1 Commercial and Nutritive imp	oortance		
	/ significance, composition and	Uses		
	2. Target Market	<u>√</u>		
	3. Area, Production and Product	tivity in		
	the District, State and India for	the last		
	5 years			
	4. Clusters of the project crop	in the $$		
	state.			
	5. Demand and Supply Gap		State	
			Horticulture	
			Dept.	
	6. Global producers- Country,	, Area,		
	Production, Productivity and			
	market share in the last ava	liable 5		
	years.	tial (for 1)		
	7. International trade and poten			
	8 Seasonality of fruit and its con	narison V		
	with other available fruits			
	9. Price variation of commodity	v in the $$	State Govt	
	State and nearby markets			
	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 Appl	icant √		
	for Marketing and Market viab	oility		

5.3	Financial viability		
	1. Due diligence status		
	2. Project Cost		Certified by
	3. Means of Finance		CA
	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	\checkmark	
	loan and Schedule (Annexure)		
	i. Break even Analysis		
	(Annexure)		
	j. NPV (Net Present Value)		
	k. Economic Rate of Return		
	7. Farm record keeping/ Maintenance		Records
	proposed		
5.4	Land development and Crop Husbandry		
	5.4.1.Land development		
	5.4.2. Selection of Quality Planting Material	1	
	1. Recommended and popular Cultivars-		
	varieties/hybrids, their specific		
	characteristics, requirements and		
	yields		
	2. Cultivar/Hybrid/Variety selected and	\mathcal{N}	
	Criterion adopted for selection	1	
	3. Propagation methods	N	
	4. Accredited / Good Nurseries in the	N	
	area 5 Dianting material source quality and		Numera / Cher
	5. Planting material-source, quality and	N	Nursery / Shop
	suitability		Seed quality
	5/3 Orchard / Site planning I av out and		Seeu quanty
	management		
	1 Planning establishment and layout		
	systems	v	
	2 I and preparation		
	3 Planting Season / time and density	V	
	5. Francing Season / time and delisity	1	1

	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 & pollinisers		
	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. Protective cover structure		Technical
			standards
			Undertaking of
			expertise /
			competency by
			Agency
	2. Farm Mechanisation		Company
			Brochures
	5.4.6.Harvesting and Fruit / flower care		
	management	,	
5.5	Post-Harvest Management		
	1. Post-Harvest infrastructure scenario in		
	horticulture sector in the State and		
	specially for the proposed crop /		
	component		
	2. Product/ Process Flow chart	N	
	3. Lay out / Floor Plan of post-harvest	N	
	operations	1	
	4. Post-harvest operations (Based on	N	Protocols
	applicability)		
	5. Pre-cooling	N .	
	o. Curing	N	
	/. Cleaning / Washing	N	
	8. Sorting and Grading	N	N 11
	9. Packing and labelling	N	Models
	10. Ripening	N	
	11. Transport	N	
1	LL'A Storage Low cost / cold storage/CA	1 $$	
	12. Storage- Low cost / cold storage/ CA	•	
	13. Post-harvest infrastructure – Integrated		Technical

	component is proposed)		
	1. Integrated Pack house		
	2. Pack House		
	3. Pre-cooling unit		
	4. Cold Room (Staging)		
	5. Mobile Pre-cooling unit		
	6. Ripening Chamber		
	7. Primary Processing		
	8. Refer van		
	9. Retail outlet		
	10. Labour room		
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		
	Stations and Experts names 2. Agri/Horti-Business incubators		
7	Stations and Experts names2.Agri/Horti-Business incubatorsFoodSafety-With/WithoutGAP		
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety ertification	√	
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification I. GAP Certification if any	√ 	
7	Stations and Experts names2. Agri/Horti-Business incubatorsFoodSafety-With/WithoutGAPcertification1. GAP Certification if any2. Food safety measures	√ √	Clean farm,
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting		Clean farm, Trained
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any - 2. Food safety measures - - a. Pre-planting - - b. Crop husbandry - -		Clean farm, Trained workers;
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. 2. Food safety measures 3. a. Pre-planting 5. b. Crop husbandry 5. c. Harvestings 5.		Clean farm, Trained workers; Protective
7	Stations and Experts names2.Agri/Horti-Business incubatorsFoodSafety-With/WithoutGAPcertification1.GAP Certification if any2.Food safety measuresa.Pre-plantingb.Crop husbandryc.Harvestingsd.Post-harvest		Clean farm, Trained workers; Protective clothing,
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest		Clean farm, Trained workers; Protective clothing, Safety
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest	$\frac{}{}$	Clean farm, Trained workers; Protective clothing, Safety equipment; Eirst Aid
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Sefety end
7	Stations and Experts names2.Agri/Horti-Business incubatorsFoodSafety-With/WithoutGAPcertification1.GAP Certification if any2.Food safety measuresa.Pre-plantingb.Crop husbandryc.Harvestingsd.Post-harvest	$\frac{}{}$	Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hugiana
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest	$\frac{}{}$	Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy: Weste
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest	$\frac{}{}$	Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan
7 8 9	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan Proposed insurance
7	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest James		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan Proposed insurance details if any
7 7 8 9 10	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest Innovation if any Risk Management		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan Proposed insurance details if any
7 7 8 9 10	Stations and Experts names 2. Agri/Horti-Business incubators Food Safety -With /Without GAP certification 1. GAP Certification if any 2. Food safety measures a. Pre-planting b. Crop husbandry c. Harvestings d. Post-harvest Innovation if any Risk Management Checklist Declaration from Crop Expert and Project		Clean farm, Trained workers; Protective clothing, Safety equipment; First Aid; Safety and Hygiene policy; Waste Management Plan Proposed insurance details if any

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 Exp	pert	(Could be any working or retired faculty / scientist in ICAR/ CAU/SAU/SHU/State Horticulture Dept. or ICAR Agri/Horti_business_incubators)
	c ·	ICTAX right florti-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 and State Government if proved false at any stage NHB is entitled to recover any 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:

Annexure: Proposed Stages in NHB Scheme Implementation

Stage	Player	Step	Mode	Timeline	Remarks /
	-				Enclosures
1	Applicant	Submission of Prescribed	Online		No document
		Application -specific to the			is required to
		scheme enclosing DPR			be enclosed
		based on model template.			but with
					requisite fees.
2	NHB	Examines the Application		Target	Evaluated by
		and DPR and gets it		1 Month	a panel of 3
		appraised for Agro-climatic			experts.
		suitability, Market viability,			Kept
		Technological feasibility			confidential.
		and capability of applicant			
		duly considering the budget,			
		priority (SabkaSaathSabka			
		Vikas) and design of			
		implementation of the offer /			
		Year.			
3	Applicant	If the project is sound, NHB		Max. I	Prescribed
	+ Bank	informs Pre-In Principle		month	documents
		Approval (Pre-IPA) to the		(11 1	including
		applicant to submit all the		(Allowed	those
		prescribed / requisite		max.5	specified in
		documents along with		months	DPK
				strictly)	checklist.
		• Bank Appraisal of			
		Market viability and			
		Financial Viability			
		(SHOULD DE ALLEL INFID)			
		ric-irA),			
		• and Sanction (after Approical) within 3			
		months of NHB Pre			
		II A.			
		Any lapse in time line, the			
		Pre-IPA stands vacated /			
		rejected. However he is			
		eligible for fresh			
		submission.			
4	Applicant	Undergoes 2 Weeks training			
		programme on the project /			
		Crop at his own expenses in			
		an institute recommended /			
		approved by NHB			
5	NHB	NHB examines the		2 months	
		application, DPR with			
		reference to documentary		Target	

		evidence and Bank	1 Month	
		Appraisal of Market	1 Wionun	
		viability and financial		
		viability duly considering		
		the budget priority		
		(SablesSaathSables Viles)		
		(SabkaSaatiiSabka Vikas)		
		and design of		
		implementation of the offer /		
		Year.		
6		NHB takes decision on		
		according In-Principle		
		Approval (IPA) to the		
		applicant. In case it is		
		approved, it is informed to		
		the applicant.		
7		In case of projects rejected		
		by NHB, the entrepreneur is		
		provided an opportunity to		
		make his case by way of		
		presentation of his project		
		on an appointed day in the		
		presence of competent		
		authority.		
		The forum objective is to		
		help the entrepreneur to		
		know the weaknesses of the		
		project currently and enable		
		him/ her to review / revise		
		his/ her project as deem		
		appropriate to suit NHR		
		requirements The		
		antranzonaur is open to		
		entrepreneur is open to		
		submit project proposal		
0	A 1' (alfesn.	10 (1	
8	Applicant	where ever IPA is issued-	18 months	
		Applicant has to complete		
		the project within the		
		prescribed time limit. Else		
		the IPA stands vacated /		
		cancelled.		
9	Applicant	Applicant submits subsidy	3 months	Prescribed
		claim within 3 months of		documents
		completion of the project.		
		Else the IPA stands vacated		
		and rejected		
10	NHB +	NHB undertakes Joint	 Target:	
	Bank/ FI+	Inspection of the field/	Max. 30	
	Applicant	activity	days of	
		-	request	

11	NHB	NHB JIT submits JIT report	15 days	
12	NHB	NHB examines the JIT	2 months	
		report and takes decision on		
		release of subsidy subject to		
		Scheme conditions and		
		publish decision / minutes of		
		competent authority with		
		reasons in NHB website.		
13	NHB	In case NHB approves		
		release of subsidy, releases		
		funds with in 15 working		
		days of minutes of		
		competent authority to SRF		
		account.		
14	Bank/	1. Confirms the receipt of		
	Applicant	subsidy.		
		2. Closely monitor the		
		project health for over 5		
		years.		
		3. Takes into consideration		
		the NHB advisories.		
15	Applicant	1. Confirms the receipt of		
		subsidy.		
		2. Maintain farm records		
		and accounts.		
		3. Adopts technology /		
		scientific package of		
		practices and innovate		
		marketing / business		
		strategies.		
		4. Takes into consideration		
		the NHB advisories.		
		5. Regularly reports the		
		performance of project		
		health		
		6. Share best practices if		
		any to NHB.		

Please contact for any further crop specific information:

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THE END