

Concept Note on Project Vriskh-ayush

1. INTRODUCTION:

India is probably one country which is fighting COVID-19 crisis bravely with help of social distancing and lock down measures. The morbidity is at 0.0016% of population while mortality is about 3.5% among the diagnosed subjects. The morbidity rate and mortality rate of COVID-19 in India are very less when compared to the top ten worst hit countries in the world. Several factors including the traditional practices might resulted in exceptionally low incidence and low mortality rate along with the natural immunity.

COVID-19 distorted lot of commercial activities leading to a serious impact on the country's economy. The Hon'ble Prime Minister announced a Rs, 22,00,000 cr. financial package which is the largest in the world for handling the COVID-19 crisis. Many workers living in the urban have relocated to rural areas. Therefore, this is the right time to boost up our rural economy by creating avenues for the people in their respective villages. Agriculture has been the backbone for the socio-economic balance in the rural India.

The Indian scenario for healthcare also seen a major shift to natural products due to COVID-19 crisis. Many of the herbal / traditional recipes have emerged as the preventive approaches for COVID-19. Despite only 30% of workers turning to work in the AYUSH industry, there is a reported 30% growth in the first quarter of 2020-21 (the official report will be available after 30th June). This jump was possible due to increased export as well as domestic market. There is 4 times increase in the export of key herbal ingredients reported from India (viz., *Ashvagandha*, *Giloi*, *Tulsi*, *Kalmegh*, *Mulethi* etc.). This would put further burden on already suffering supplies of key ingredients from wild collections. To make the red-endangered-threatened (RET) available to the industry, cultivation will be the only possible measure. The current situation is the best situation to attract people towards the cultivation activities since they have migrated back to their respective villages.

Under ***Atma Nirbhar Bharat*** Abhiyan, the farmers / local communities will be entitled for subsidized medicinal plant cultivation activity by which they provide quality raw material to the AYUSH industry and through the backward integration. The buy-back guarantee from industry through their backward integration will be of real help to the rural population. In two years, the income of the farmers will be doubles and they will become self-sustainable / self-sufficient. The new system of input and output based subsidy as well as incentives to the farmers is the highlight of the scheme. At the same time, by encouraging the backward integration by the industry Rs. 5,000 cr. income increase can be achieved. This is possible from the '*Actual Benefit Sharing*' where farmer gets the market price directly from the manufacturer / end user. Various other schemes will also be integrated with the present scheme and farmer income will be doubled in next 18 months' time.

Medicinal plants opportunity:

India is one of the richest countries in the world in terms of biodiversity, has 15 agro-climatic zones. Out of the 17000-18000 species of flowering plants, more than 7000 are estimated to have medicinal usage in folk and documented systems of medicine like Ayurveda, Unani, Siddha & Homoeopathy (AYUSH System of Medicine).

Medicinal plants are not only a major resource base for the traditional medicine & herbal industry but also provide livelihood and health security to a large segment of Indian population. About 1178 species of medicinal plants are estimated to be in trade of which 242 species have annual consumption levels more than 100 metric tons/year.

Total consumption of herbal raw drug in the country for the year 2004-05 was 3,17,000 MT with a trade value of ₹ 1,070 Cr in FY 2 2014-15 has been estimated at 5,12,000 MT with corresponding trade value of ₹ 7,000 Crore. The major increase has been recorded in export value which has increased from ₹ 345.80 crore in 2005-06 to ₹ 3211 crore in 2014-15, registering a nine-fold increase during, one decade. In 2014-15, the domestic and export markets for medicinal plants has been estimated at 1,95,000 MT and 1,34,500 MT respectively - [Goraya & Dev 2017].

In 2018, the CII report indicated that the overall turnover of AYUSH industry is about ₹30,000 Crore with raw material turnover of ₹ 10,000 Crore. NMPB recent evaluations suggests that there is a 6% increase in the volume at a year on year basis in the raw material (7,00,000 MT Estd.) and the corresponding value of raw material is 20-22% which is approx. ₹ 15,000 Cr. With increased usage of many of the herbal products, there is a 4-6-fold demand for export of key herbs like *Asvagandha*, *Tulsi*, *Giloi*, *Kalmegh* etc. This survey reports indicate 30-35% growth of herbal products sales due to COVID-19.

Role of NMPB (National Medicinal Plants Board): To promote medicinal plants sector, Government of India set up National Medicinal Plants Board (NMPB) on 24th November 2000. Currently the board is working under the Ministry of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homoeopathy), Government of India. The primary mandate of NMPB is to develop an appropriate mechanism for coordination between various Ministries/ Departments/ Organization and implementation of support policies/programs for overall (conservation, cultivation, trade and export) growth of medicinal plants sector both at the Central /State and International level.

Aims & Objectives of the board: In recent years' cultivation of medicinal plants has started gaining momentum, still a significant part of our requirements continued to be met from wild sources. To meet increasing demand for medicinal plants NMBP focuses on in-situ & ex-situ conservation and augmenting local medicinal plants and aromatic species of medical significance. The NMPB also promote research & development, capacity building through trainings, raising awareness through promotional activities like creation of Home/School herbal gardens. NMPB also seek to support programs for quality assurance and standardization through development of Good Agricultural and Collection Practices (GACPs), development of monographs laying down standards of quality, safety and efficacy; development of agro-techniques and credible institution a mechanism for certification of quality of raw drugs, seeds and planting material. Overall, NMPB's main objective is the development of medicinal plants sector through developing a strong coordination between various ministries/ departments/ organization for implementation of policies / programs on medicinal plants.

BUDGET FOR THE PROJECT

The budget requirements and expenditure details are as following:

Cost Analysis of the project and the resource evaluation		
I.	Farmer / ASU industry partner component of any cultivation scheme	5,333=00
II.	Atma Nirbhar Bharat scheme package offered by finance ministry	4,000=00
III.	Money invested by Pvt. (Parties CSR etc) / stakeholders as their 2/3 rd 's investment	2,000=00
IV.	NMCG program sanctioned component	55=00
V.	FY 2020-21 NAM Budget	112=00
B	Total amount contributed by all	Rs. Cr. 11,500=00

The budget requirements and expenditure details are as following:

Details of the project costing		Rs. In Cr	Rs. In Cr	Rs. In Cr
		2020-22	2020-21	2021-22
1.	Cost of cultivation (Vriksh-Ayush) component for 10,00,000 ha	3,720=00	1860=00	1860=00
2.	Mandi (Oushadhi Dham) component - budget 50 cr. x 5 No. [75 Ac (approx.) including 12 mobile testing labs @ Rs. 40 lac each]	250=00	125=00	125=00
3.	Namami Gange - NMCG program with 810 ha commercial cultivation of medicinal plants (and 3000 ha or conservation of med plants)	55=00	27=50	27=50
4.	Man power and other operational costs @ 2% cost NMPB new staff; SMPB & RCFC support	30=00	15=00	15=00
5.	Existing projects of NMPB under NAM scheme for 2020-21 (including 27 warehouses & 27 Post-Harvesting units)	112=00	112=00	--
Total Budget requirement		Rs. Cr. 4,167=00	2139.50	2027.50

Note: project wise expenditure and outcome revenue are mentioned in the budget / cost analysis annex.

COMPONENTS OF MISSION VRIKSH-AYUSH:

Mission *Vriksh-ayush* is meant for the following three major activities:

- 1.) *Cultivation of medicinal plants*
- 2.) *Improving the income of the farmers*
- 3.) *Establishment of mandis (Oushadha-Dham)*

1.) **Cultivation of Medicinal Plants in 10 lac ha:**

i. **Ashoka Setu:** (covers 16 states; 7 lac ha; Rs.)

Ashoka Plantation along with high selling med plants (top 10 herbs):

Ashoka (Saraca asoca) is an important tree species which grows as medium sized tree and its bark and other parts are used as herbal raw material for various ayurvedic medicines and health products. Its availability is a real concern for the industry as well physicians. Therefore, in an area of **7 lac ha**, **2 lac ha** area shall be brought under Ashoka plantation (about 700 tree plants per ha i.e., 14 cr. tree plants in total) and 5 lac ha shall be covered with high selling 10 herbaceous species. The medicinal herbs will be grown in mixed cropping or in intercropping pattern with *Ashoka* tree plantations for short term to medium term economic returns.

Cost of cultivation of Ashok & herbs together

Sl. No.	Common Name	Botanical Name	No. of ha. 2020-21	No. of ha. 2021-22	Cost per ha.	Total Cost / ha / yr	cost per year 2020-21	cost per year 2021-22
1	Ashok	<i>Saraca asoca</i>	1,00,000	1,00,000	1.40,000	2800 cr.	1400 cr.	1400 cr.
2	Other herbs	10 species	2,50,000	2,50,000	1,40,000	7000 cr.	3500 cr.	3500 cr.
		TOTAL	3,50,000	3,50,000	1,40,000	9800 cr.	4900 cr.	4900 cr.

Average cost of individual species (top 10-20 species)

Sl. No.	Common Name	Botanical Name	area under cultivation	Cost norms in the present scheme / ha	Total Cost in Cr
1	Asvagandha	<i>Withania somnifera</i>	7000	43757.55	12.25
2	Satavari	<i>Asparagus racemosus</i>	7000	109393.89	45.95
3	Tulsi	<i>Ocimum sanctum</i>	7000	52509.06	14.70
4	Guduchi	<i>Tinospora cordifolia</i>	7000	48133.31	13.48
5	Kalamegh	<i>Andrographis paniculate</i>	7000	43757.55	12.25
6	Bhumyamalaki	<i>Phyllanthus amarus</i>	7000	48133.31	13.48
7	Salaparni	<i>Desmodium gangeticum</i>	7000	78763.6	22.05
8	Prishniparni	<i>Uraria picta</i>	7000	72637.54	20.34
9	Mudgaparni	<i>Phaseolus trilobatus</i>	7000	72637.54	20.34
10	Mashaparni	<i>Teramnus labialis</i>	7000	70012.09	19.60
11	Barahmi	<i>Bacopa monnieri</i>	7000	70012.09	19.60
12	Mandukaparni	<i>Centella asiatica</i>	7000	70012.09	19.60
13	Musta	<i>Cyperus rotundus</i>	7000	109393.89	45.95
14	Usira	<i>Vetivera zizanioides</i>	7000	109393.89	45.95
15	Vacha	<i>Acorus calamus</i>	7000	109393.89	45.95
16	Punarnava	<i>Boerhavia diffusa</i>	7000	52509.06	14.70
17	Chitramamula	<i>Plumbago zeylanica</i>	7000	52509.06	14.70
18	Trivrit	<i>Operculina turpethum</i>	7000	58269.87	16.32
19	Jeevanti	<i>Leptadenia reticulata</i>	7000	109393.89	45.95
20	Sankhapushpi	<i>Convolvulus pleuricaulis</i>	7000	58269.87	24.47

Operational Details

Tree-species - Under Ashoka-Setu plantation model, Ashoka and its associate tree species shall be taken up for plantation in 16 states namely Arunachal Pradesh, Assam, Sikkim, West Bengal, UP, Bihar, MP, Rajasthan, Andhra Pradesh, Telangana, Tamil Nadu, Karnataka and Kerala where commercially viable plantation as well as natural populations of this species exist. About 700 saplings shall be planted per hectare.

Some other associate tree species of commercial importance shall also be included in combination with Ashoka, depending upon the agro-climatic suitability, like Bel (*Aegle marmelos*), Amla (*Emblica officinalis*), Rakat Chandan (*Pterocarpus santalinus*) etc.

Herb species for mixed-cropping - Roughly 70% of the space available in the land taken up for Ashoka plantation shall be utilized for planting of intercrop herbal species, either by direct sowing or through cuttings / rhizomes. The following 10 species will be priority viz., *Asvagandha*, *Shatavari*, *Giloj*, *Tulsi*, *Kalamegha*, *Bhumiamla*, *Salaparni*, *Prishniparni*, *Mudgaparni*, & *Mashaparni*. (**Note:** Another 10 species are listed as alternatives). The cultivation of herbal species in intercropping mode would enhance economic viability by ensuring short-term and long-term returns.

Quality Planting Material (QPM)

To meet requirement of QPM in the form of seedlings, seeds, Rhizomes and cuttings, the state medicinal plants board/ other implementing agencies under NMPB have maintained model nurseries, wherein 5 crores of saplings of Ashoka trees and its associate species are available for current year plantation. The balance QPM shall be arranged from certified authentic sources in private sector or from State Forest departments or Research organizations. For 2021-22 year, the advance work of QPM, production shall be initiated, to meet next year's requirement. The detail of model nurseries is mentioned below:

Sl. No.	Name of Nursery	State/District	QPM available / generated for plants during 2020-21	
1.	Kovel Foundation	Andhra Pradesh	Ashoka Raktachanan	2,00,000
	Bhagavatula Charitable trust	Andhra Pradesh	Ashoka Raktachana	1,00,000
2.	Forest Nursery	Arunachal Pradesh	Ativisha	5,00,000
	-do-	Arunachal Pradesh	Ashoka	2,50,000
3.	Pragya nursery	Assam	Pippali	2,00,000
	SMPB & forest nuresery	Assam	Ashoka	2,00,000
	Private	Assam	Ashoka	3,00,000
	Forest nuresries	Assam	Guduchi	10,00,000
4.	Botanical garden nursery	Chandigarh	Ashoka	1,00,000
	SMPB nursery	Chandigarh	Ashoka	1,000
	Forest dept nursery	Chandigarh	Ashoka	1,000
5.	Delhi Govt. forest nurseries	Delhi	Ashoka	1,00,000
	SMPB nurseries	Delhi	Ashoka	1,00,000
8.	Forest Dept. nursery	Haryana	Ashoka	1,00,000
		Haryana	Yashtimadhu	10,00,000
	SMPB nursery	Haryana	Ashoka	2,000
9.	KFRI, Trivendrum	Kerala	Ashoka Vidanga Raktachandana Saptachakra	10,00,000 2,00,000 1,00,000 2,00,000
10.	SMPB & Forest Dept	Karnataka	Ashoka Chandana Raktachandna	3,00,000 2,00,000 1,00,000
11.	SMPB	MP	Giloi Arjuna Haritaki Vibhitaki Amalaki Kanchanara Kutaja	5,00,00,000 2,00,000 1,00,000 1,00,000 5,00,000 1,00,000 2,00,000
	Pvt nurseries	MP	Brihat Panchamula	5,00,00,000
12.	Forest dept	Maharashtra	Pippali Chalumogra	2,00,00,000 1,00,000
	Pvt nureries	Maharashtra	Mudgaparni Mashaparni Bharangi	1,000 kg 1,000 kg 10,00,000

	SMPB / RCFC	Maharashtra	Brihat panchamula Bharangi	10,00,000 2,00,000
13.	Baitarani	Odisha	Triphala collection	
		Odisha	Ashok	2,50,00,000
14.	BRKR college nursery	Telangana	Ashoka Brihat Panchamula	2,00,000 5,00,000
	Forest nursery	Telangana	Ashoka	2,00,000
	-do-	Telangana	Ashoka	2,00,000
	-do-	Telangana	Ahoka Brihat Panchmula	2,00,000 5,00,000
	Pragati Bio-pharma	Telangana	Ashoka	1,00,000
15.	Asha Gramodyog nursery	Uttar Pradesh	Giloi Ushir Musta Prishniparni Shalaparni Bhumyamla Mandukaparni Brahmi Musta Vacha Mudgaparni Mashaparni	10,00,000 1000 kg 10,00,000 1000 kg 500 kg 500 kg 500 kg 500 kg 500 kg 50,00,000 1,000 kg 1,000 kg
16.	PVt. farmers	West Bengal	Kachur (Kaempforth galanga) Ushir	5,00,000 3,00,00
	SMPB / RCFC nursery	West Bengal	Ashoka	2,00,000
	Foest dept. nursery	West Bengal	Ashoka	5,00,000

ii. Guggulu Corridor: (covers 3 states; 10 k + 10 k = 20 ha; Rs. 280 + 140 cr.)

Guggulu (Commiphora wightii (Arn.) Bhandari) is a small tree / shrub which grows to a maximum height of 4 m (13 ft), with thin papery bark. Its gum-resin / oleoresin is used as herbal raw material for various ayurvedic medicines and health products. It is known for its importance in the management of arthritis, dyslipidemia, diabetes etc. It is a arid zone plant which can grow without any water requirement. Its companion species include several arid plants. At the same time various medicinal herbs can be intercropped with this tree when planted outside waste land or rocky soil. *Shatavari*, *Himsra*, *Jeevanti* are some of the associated species. It has been over exploited due to high demand creating scarcity of raw

material for AYUSH industry. It is IUCN listed critically endangered plant. Therefore, deserves immediate attention.

Operational Details:

Under Guggulu Corridor project Guggulu plant and its associate species shall be taken up for plantation in states namely Madhya Pradesh, Rajasthan and Gujarat where commercially viable plantation as well as natural plantation of this species exist. Mostly dry and non-irrigated lands will be used in this corridor to promote “desert cultivation” as a new model for medicinal plants cultivation.

The other tree species of commercial importance which shall be taken up for plantation under this plantation model, depending upon the agro-climatic suitability are: *Sallaki (Boswellia serrata)*; *Shatavari (Asparagus racemosus)*; *Himsra (Capparis sepiaria)*; *Sankhapushpi (Convolvulus pleuricaulis)*; *Isabgol (Plantago ovata)* etc. About 500 saplings shall be planted per hectare.

Cost of cultivation of Guggulu & herbs together

Sl. No.	Common Name	Botanical Name	No. of ha. 2020-21	No. of ha. 2021-22	Cost per ha.	Total Cost / ha / yr	cost per year 2020-21	cost per year 2021-22
1	Guggulu	Commiphora whightii	5,000	5,000	2,80,000	280 cr.	140 cr.	140 cr.
2	Sankhapushpi	C. pleuricaulis	5,000	5,000	1,40,000	140 cr.	70 cr.	70 cr.
		TOTAL	10,000	10,000	1,40,000	420 cr.	210 cr.	210 cr.

Details of mixed cropping species with Guggulu

Sl. No.	Common Name	Botanical Name	Propagation method	No. of ha for plantation	Quantity of seeds / plants required
1.	Sankhapushpi	Convolvulus pleuricaulis	Seed	4,000	200 g / ha = 800 kg
2.	Trivrit	Operculina turpethum	Seed	2,000	2 kg / ha = 4,000 kg
3.	Jeevanti	Leptadeni reticulata	Seed / cuttings	2,000	5000 cuttings / ha = 1 Cr cut
	Isabgol	Plantago ovata	Seed	--	--
	Satavari	Asparagus racemosus	Seed / root	--	--
	Sallaki	Boswellia serrata	Saplings	--	--

Short gestation Period Herbal Species:

Sankhapushpi (Convolvulus pleuricaulis), *Shatavari (Asparagus racemosus)*, *Isabgol (Plantago ovata)*, *Himsra (Capparis sepiaria)*, etc., have 6-15 months of gestation period while Guggulu will take 6-8 years for first tapping. About 70% of the space shall be used for plantation of these herbal species.

The cultivation of herbal species in intercropping mode would make it a viable working model for short term and long-term returns, depending upon the local conditions. Efforts shall be made to take a cultivation of local fodder / vegetables in the intercropping mode in convergence with agriculture department.

At the rate of 500 saplings to be planted per hectare, 50 lacs saplings of *Guggulu* are required for the 10,000 ha.

Plantation of Herbs:

About 70-75% of the space available in the land taken up for plantation shall be utilized for planting intercrop herbal species, either by direct sowing or through cuttings /rhizomes.

[Note: Wherever feasible and in consultation with producers, fodder / vegetables cultivation in intercropping mode would be promoted in convergence with agriculture department.]

Quality Planting Material (QPM)

To meet requirement of QPM of seeds and/or cuttings, the state medicinal plants board / other implementing agencies under NMPB have maintained model nurseries, wherein 50 lacs of saplings and/or cuttings of *Guggulu* plants available and its associate species seedlings are obtained from the available nurseries of NMPB in the current year plantation. Most importantly, the development areas for *Guggulu* will provide sufficient cuttings. If any QPM is further required, shall be arranged from certified authentic sources in private sector or from State Forest departments or Research organizations. For 2021-22 year, the advance work of QPM, production shall be initiated. **The details of models nurseries are provided in the table below:**

Sl. No.	Name of Nursery	State/District	QPM available / generated for plants during 2020-21	
1	NGO nursery	Gujarat	Guggulu	1,00,000
	GFDC nurseries No. 8	Gujarat	Guggulu	50,00,000
	SMPB nursery	Gujarat	Guggulu	5,00,000
	Dabur nursery	Gujarat	Guggulu	1,00,000
	Zandu nursery	Gikarat	Kapikacchu	2,00,000
2	SURE (NGO) nursery	Rajasthan	Guggulu	5,00,000
			Jeevanti	200 kg
			Sankhapushpi	100 kg
			Isabgol	1000 kg
			Trivrit	100 kg

		Sallaki	2,00,000
		Khadira	1,00,000
		Babbooala	5,00,000

iii. **Brihat Panchamul Cultivation:** (covers 6 states; 1 lac ha; Rs.)

Bilva (Aegle marmelos), Agnimantha (Premna integrifolia), Gambhari (Gmelina arborea), Patala (Sterospermum saveolens) & Syonaka (Oroxylum indicum) comprises *Brihat Panchamula*. These are all small to medium sized trees which grows to a maximum height of 5-10 m (15-30 ft) with light brown to yellowish brown or brown coloured bark. Originally their root / root bark is used in the texts which is replaced with stem bark by the pharmacopoeia committee. Through a five-year study with industry, NMPB established that their young roots when cultivated through short-term high-density plantation will have the same benefits as root bark or stem bark. All the five-plant stem bark is used as herbal raw material for various ayurvedic medicines and health products. All of them are known for their importance in the management of arthritis, female health, neurological diseases etc. They can be grown at almost all the places across India. This model will not use any intercropping as there is no scope for other species due to high density plantation of five species. *Brihat Panchamula* have been over exploited due to high demand creating scarcity of raw material for AYUSH industry.

Cultivation Model:

Under BPM project five plants species shall be taken up for plantation in states namely Madhya Pradesh, Chhattisgarh, Odisha, Telangana, Andhra Pradesh, and Maharashtra. About 11,00 saplings / cuttings shall be planted per hectare. Already there are cultivation projects ranging to more than 500 Ac are available and planting material is not a problem since the sowing and nursery procedures are well documented.

Herbal Species: *Agnimantha (Prmna integrifolia)* requires 6-9 months for harvesting; *Syonaka (Oroxylum indicum)* and *Gambhari (Gmelina arborea)* requires 12 months; *Patala (Stereospermum saveolens)* requires 18 months); and *Bilva (Aegelos marmelos)* requires 2 years before harvesting. 100% of the space shall be used for plantation of these tree species. The cultivation of herbal species as intercropping is not possible in this model due to high density plantation. At the

rate of 11,000 saplings to be planted per hectare, 110 Cr saplings / cuttings of *BPM (5 species)* are required for the 1,00,000 ha in 2 years which is easily achievable.

Plantation of Herbs: Entire 100% of the space available in the land taken up for plantation shall be utilized for planting intercrop herbal species, either by direct sowing or through cuttings /rhizomes. Wherever feasible and in consultation with producers, fodder / vegetables cultivation in intercropping mode would be promoted in convergence with agriculture department.

Cultivation of BPM as HDST (High Density Short Term) plantation

Sl. No.	Common Name	Botanical Name	No. of Plants / ha	ha 2021-22	ha 2021-22	No of plants 2020-21	No of plants 2021-22	Total area	No of plants
1	Bilva	Aegle marmelos	3000	10,000	10,000	4,00,00,000	4,00,00,000	20,000	8,00,00,000
2	Agnimanth	Premna integrifolia	3000	10,000	10,000	4,00,00,000	4,00,00,000	20,000	8,00,00,000
3	Gambhari	Gmelina arborea	3000	10,000	10,000	4,00,00,000	4,00,00,000	20,000	8,00,00,000
4	Patala	Stereospermum sav.	3,000	10,000	10,000	4,00,00,000	4,00,00,000	20,000	8,00,00,000
5	Syonaka	Oroxylum indicum	3,000	10,000	10,000	4,00,00,000	4,00,00,000	20,000	8,00,00,000

Cost of cultivation of BPM as HDST plantation

Sl. No.	Common Name	Botanical Name	No. of ha. 2020-21	No. of ha. 2021-22	Cost per ha.	Total cost per 1 lac ha	Cost / ha / yr in 2020-21	cost / ha / yr 2021-22
1	Bilva	Aegle marmelos	10,000	10,000	1,50,000	300 cr.	150 cr.	150 cr.
2	Agnimanth	Premna integrifolia	10,000	10,000	1,50,000	300 cr.	150 cr.	150 cr.
3	Gambhari	Gmelina arborea	10,000	10,000	1,50,000	300 cr.	150 cr.	150 cr.
4	Patala	Stereospermum saveolens	10,000	10,000	1,50,000	300 cr.	150 cr.	150 cr.
5	Syonaka	Oroxylum indicum	10,000	10,000	1,50,000	300 cr.	150 cr.	150 cr.
						1500 cr.	750 cr.	750 cr.

Note: a combination of 9 months to 24 months HDST plantation is developed for equal quantity of yield at the time of harvest of 24 month crop. Agnimanth, Syonak, & Gambhari can be harvested after 12 months while Paala & Bilva requires 24 months.

Quality Planting Material (QPM)

To meet requirement of QPM of seeds and/or cuttings, the state medicinal plants board / other implementing agencies under NMPB a10 x 50 ft would be 50-70 thousand seedlings for four species except Agnimanth. From existing farms and wild Agnimanth total quantity can be obtained in one year. If any QPM is further required, shall be arranged from certified authentic sources in private sector or from State Forest departments or Research organizations. For 2021-22 year, the advance work of QPM, production shall be initiated. **The details of model nurseries are tabulated below:**

Sl. No.	Name of Nursery	State/District	QPM available / generated for plants during 2020-21	
1	Kovel Foundation	Andhra Pradesh	Brihat panchamula	10,00,00,000
2	Forest nursery Dhamtari	Chhattisgarh		20,00,00,000
	SMPB nursery	Chhattisgarh		10,00,00,000
	Agriculture dep nursery	Chhattisgarh		10,00,00,000
3	TFRI	Madhya Pradesh	Brihat panchamul	5,00,00,000
	Pvt nurseries	MP	Brihat Panchamula	5,00,00,000
4	SMPB / RCFC	Maharashtra	Brihat panchamula	10,00,00,000
5	Baitarani & Forest nurseries	Odisha	Brihat Panchamula	30,00,00,000
6	BRKR college nursery	Telangana	Brihat Panchamula	5,00,00,000
	-do-	Khammam	Brihat Panchmula	5,00,00,000

NOTE: The seed / cutting requirement will be as following: Bael 4-5 kg; Agnimanth – 25,000 cuttings; Gambhar – 40-45 kg; Padal – 3-4 kg; and Syonak – 2.5 kg per ha.

iv. **Namai Gange - NMCG program: (covers 5 states; 800 ha; Rs.)**

NMPB's participation will be possible in three areas of NMCG program viz., Bio-Diversity; Afforestation; and Public awareness. This program is named as "NMPB-NMCG program". Total 5 states covering 1024 villages this program will cover an area of 810 ha with commercial cultivation of medicinal plants. Another 3000-3500 ha of area is meant for conservation; resource augmentation; bio-remediation; and IEC programs have been proposed worth of Rs. 55 cr (approx.) to Namami Gange Project implementation team. This budget is in principle agreed by NMCG team and will be funded by them. Along the identified villages, 20 medicinal tree bark species and 10 herbs / shrubs will be planted.

Tree species:

1. Arjuna (Terminalia arjuna)
2. Bakula (Mimusops elangi)
3. Kutaja (Wrightia tinctorial)
4. Babbula (Acacia nilotica)
5. Jambu (Syzygium jambosa)
6. Lodhra (Symplocos racemose)
7. Bilva (Aegle marmelos)
8. Patala (Stereospermum saueolens)
9. Kanchanara (Bauhinia variegata)
10. Nimba (Azadirachta indica)
11. Asvattha (Ficus religiosa)
12. Vata (Ficus benghalensis)
13. Udumbara (Ficus glomerate)
14. Parisha (Thespecia populnia)
15. Syonaka (Oroxylum indicum)
16. Gambhari (Gmelina arborea)

17. Sirisha (Albezia lebbek)
18. Ashoka (Saraca asoca)
19. Badara (Zizyphus jujubera)
20. Amalaki (Emblica officinalis)

Herbs / Shrubs:

1. Salaparni (Desmodium gangeticum)
2. Prishniparni (Uraria picta)
3. Musta (Cyperus rotundus)
4. Usira (Vetiveria zizanoides)
5. Lamajjaka (Cymbopogan jwarankusha)
6. Darbha (Desmostachya bipinnata)
7. Vamsa (Bamboosa aurundinacia)
8. Satavari (Asparagus racemosus)
9. Asvagandha (Withania somnifera)
10. Vrischikali (Martyna annua)

NMPB also plan to complete 150 herbal gardens in this area; plantation of 3-5 lakh trees; and cultivation of at least 800 ha of land. Organic cultivation and bioremediation will be the focused approaches. (**Project Plan attached**)

v. **Alpine & Temperate species corridor: (covers 12 states; 1 lac ha; Rs.)**

Alpine plants are plants that grow in an alpine climate, which occurs at high elevation and above the tree line. They include perennial grasses, sedges, forbs, cushion plants, mosses, and lichens. Alpine plants are adapted to the harsh conditions of the alpine environment, which include low temperatures, dryness, ultraviolet radiation, and a short growing season. However these plants are the main constituents of Ayurvedic System.

Cultivation Model:

India has a vast range of Alpine & Temperate area ranging from Jammu and Kashmir to Arunachal Pradesh. The area is abode of several high value endemic medicinal plants having high industrial demand (Goraya and Ved, 2017). Mainstreaming of communities living in high altitude with the help of medicinal plants cultivation would provide increased livelihood and decrease in migration. On the other hand, about 15 RET species of high-altitude are less available are often adulterated. Their availability issues are also cause of concern for AYUSH industry. Both the alpine and temperate species are address under this program.

Herbal Species:

Astavarga group consists of eight medicinal plants in Ayurveda viz., Riddhi (*Habenaria intermedia*), Vriddhi (*Habenaria edgeworthii*), Jeevaka (*Malaxis muscifera*), Rishabhaka (*Malaxis acuminata*), MahaMeda (*Polygonatum cirrhifolium*), Meda (*P. acerifolium*), Kakoli (*Roscoea alpina*) and Kshira Kakoli (*Lilium polyphyllum*). These plants are considered as a very good Rasayana with rejuvenating and health-promoting properties and are known to strengthen immune system and have immense cell regeneration capacity.

Under the temperate species, 15 Medicinal plants viz., *Ativisha* (*Aconitium heterophyllum*), *Daruharidra* (*Berberis aristata*), *Salam panja* (*Dactylorhiza tagirea*), *Sathi* (*Hedychium spicatum*), *Sea-buck thorn* (*Hippophae rhamnoides*), *Pushkarmamula* (*Inula racemose*), *Habusha* (*Juniperus cumminis*), *Jatamansi* (*Nardostachys jatamansi*),

Katuki (Picrorhiza kurroa), Revandchini (Rheum emodi), Kuth (Saussurea costus), Chirayata (Swertia chirata), Talisapatra (Abies pindrow), Tagara (Valeriana wallichii), Timur (Zanthoxylum alatum) are considered for high altitude.

Both *Astavarga* plants and temperate herbs will be taken up for cultivation in states the of Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, Assam, West Bengal, Arunachal Pradesh, Nagaland, Meghalaya, Tripura, Manipur, and Mizoram. These crops are commercially viable as well as threatened species.

For *Astavarga* species, 10,000 ha will be provided i.e., 1250 ha for each species and for rest of the 15 species an area of about 6000 ha will be allotted. This makes total coverage of 1,00,000 ha for alpine and temperate species together.

Cost of cultivation of alpine & temperate species

Botanical Name	Cost of cultivation	Area in hectare	Total cost of cultivation in Rs. Cr.
<i>Aconitum heterophyllum</i>	192533.24	6000	69.31
<i>Berberis aristata</i>	109393.89	6000	39.38
<i>Dactylorhiza hatagirea</i>	195533.24	6000	70.39
<i>Hedychium spicatum</i>	70012.09	6000	16.81
<i>Hippophae rhamnoides</i>	87515.11	6000	31.51
<i>Inula racemosa</i>	66160.7	6000	15.88
<i>Nardostachys jatamansi</i>	354436.2	6000	12.76
<i>Picrorhiza kurroa</i>	196909	6000	70.89
<i>Rheum emodi</i>	354436.2	6000	12.76
<i>Saussurea costus</i>	153151.44	6000	55.14
<i>Swertia chirata</i>	144399.94	6000	51.98
<i>Abies pindrow</i>	154399.94	6000	55.58
<i>Valeriana wallichii</i>	105018.13	6000	37.81
<i>Zanthoxylum alatum</i>	52509.06	6000	12.60
<i>Habenaria intermedia</i>	106018.13	1250	79.51
<i>Habenaria edgeworthii</i>	107018.13	1250	80.2
<i>Lilium polphyllum</i>	1069018.13	1250	80.18
<i>Malaxis acuminta</i>	102518.13	1250	76.89
<i>Microstylis muscifera</i>	106318.13	1250	79.74
<i>Polygonatum cirrhifolium</i>	106518.13	1250	79.89
<i>Polygonatum verticillatum</i>	107618.13	1250	80.72
<i>Roscoea purpurea</i>	108218.13	1250	81.22
<i>Juniperus communis</i>	108218.13	6000	38.96
Total		100000	957.42

Note: The cost of cultivation is as per existing NAM scheme.

Medicinal Plant Species Selected for Temperate/Alpine corridor

Sl. No.	Botanical Name	Common Name	Cost of cultivation	Planting Material required
	<i>Aconitum heterophyllum</i>	Atees	192533.24	2 kg seeds are required for raising seedlings for 1 hectare of land, 50 000 seedlings at a spacing of 45 cm x 45 cm may be planted.
	<i>Berberis aristate</i>	Daruhaldi	109393.89	As per agro tech developed by IIM Jammu
	<i>Dactylorhiza hatagirea</i>	Salampanja	195533.24	To develop plantlets when transplanted at 5.0cm -7.0 cm depth at a spacing of 15cm X 15 cm. about 1,11,150 tubers or tuber segments are required for one hectare of land and are transplanted 30 cm apart
	<i>Hedychium spicatum</i>	Kapurkachari	70012.09	About 64 000 propagules per hectare will be required At an optimum spacing of 45 cm x 30 cm.
	<i>Hippophae ramnoides</i>	Seabuckthorn	87515.11	By seed, sucker and cutting at the spacing of 1 to 2 meter in row to row.
	<i>Inularacemosa</i>	Pushkarmool	66160.7	1 kg seeds are required to raise about 40,000 seedlings which is required for 1 hectare of land.
	<i>Nardostachys jatamansi</i>	Jatamansi	354436.2	About 600 gm of seeds are required for raising seedlings for transplanting in 1 hectare of land.
	<i>Picrorhiza kurroa</i>	Kutki	196909	About 165 000 seedlings per hectare are needed, which means 1–1.5 kg seeds are required for raising saplings for 1 hectare of land. Rhizomes planted at a spacing of 30 cm x 20 cm
	<i>Rheum emodi</i>	Archa	354436.2	About 600 g of seeds are required to raise a nursery for planting at a spacing of 50 cm x 50 cm in 1 hectare
	<i>Saussurea costus</i>	Kuth,	153151.44	We propagate it only by seed.
	<i>Swertia chirata</i>	Chirata, Charayatah	144399.94	About 50 000 plants would be planted in 1 hectare at a spacing of 45 cm x 45 cm
	<i>Abies pindrow</i>	Pindrow fir	154399.94	
	<i>Valeriana wallichii</i>	Indian Valerian	105018.13	About 2.5–3 kg seeds are required to raise planting stock for 1 hectare of land. Planting in rows 40–50 cm apart and 20–30 cm spacing between plants in a row are recommended. Approximately, 75 000–85 000 plants are required for 1 hectare of plantation
	<i>Zanthoxylum alatum</i>	Timoor	52509.06	About 2–3 kg seeds are required to raise a nursery for plantation on 1 hectare. Direct sowing may require about 30–50 kg seeds per hectare at a spacing of 50 cm x 50 cm.
	<i>Habenaria intermedia</i>	Vridhi	106018.13	at a spacing of 20X20 cm will require 250,000 tubers.
1.	<i>Habenaria edgeworthii</i>	Riddhi	107018.13	at a spacing of 20X20 cm will require 250,000 tubers.
2.	<i>Lilium polphyllum</i>	Kshirakakoli	1069018.13	Bulbs
3.	<i>Malaxis acuminata</i>	Jeevaka	102518.13	About 1,11,100 bulbs are required for planting in one hectare area, The pseudobulbs should be planted during mid October to early November at 30X30 cm spacing accommodating
4.	<i>Microstylis muscifera</i>	Rishbhak	106318.13	About 1,11,100 bulbs are required for planting in one hectare area, The pseudobulbs should be planted during mid October to early November at 30X30 cm spacing accommodating
5.	<i>Polygonatum cirrhifolium</i>	Mahameda	106518.13	Rhizomes.
6.	<i>Polygonatum verticillatum</i>	Meda	107618.13	Rhizomes.
7.	<i>Roscoeapurpurea</i>	Kakoli	108218.13	Tuber and seeds are suitable for its propagation at the spacing of 15X10 cm.
8.	<i>Juniperus communis</i>	Hapusa		About 10,000 saplings are required for one hectare land. About 10,000 saplings are required for one hectare land. At spacing 45cm X 45cm X 45cm.

Quality Planting Material (QPM)

To meet requirement of QPM of Seedling, Seeds, Rhizomes and Cuttings the state medicinal plants board / other implementing agencies under NMPB have maintained model nurseries, wherein 5,000 of saplings of temperate / Alpine medicinal plants and Astvarga species are available for current year plantation. The balance QPM shall be arranged from certified authentic sources in private sector or from State Forest departments or Research organizations, ICAR research organizations and its branches will be consulted. For 2021-22 year, the advance work of QPM, production shall be initiated, to meet next year's requirement. **The details of model nurseries are with FRI, HRDI and RCFC-NE.**

vi. **Miscellaneous plantation: (covers 37 states/ UTs; 80 k ha; Rs.)**

About 80,000 ha are ear marked for the market dynamics based cultivation. States like Odisha, Jharkhand, Haryana, Punjab etc., will be specially prepared to take up tailor-made projects under this scheme. This component would encourage to protect each state and their requirements.

The number of species covered will be as per the existing list of 140 species.

The following activities will remain as the common factors to be considered for cultivation of medicinal plants:

Buy back arrangement:

NMPB and State implementation agencies shall facilitate the formal arrangement for buy back of produce between producers and buyer/entrepreneurs. The produce shall be purchased by the entrepreneur/buyer at mutually pre decided price. The agreement shall include the penalty clause for delayed payment and dispute redressal mechanism in the form of arbitrator whose award shall be binding on both the parties.

Modalities of subsidy disbursement to farmers:

A subsidy component of 50% of the total inputs cost of the species used for plantation shall be available to the farmers/cultivators.

The first installment of (50% subsidy amount) shall be paid by NMPB through DBT mode immediately after sanction of project. The buyer/entrepreneur shall enter into an agreement with farmers to arrange to pay upto 50% of the total input cost of cultivation during the cultivation period to make available working capital to producers.

On harvesting of the Crop, remaining 50% amount as IInd installment of subsidy shall be disbursed to producers/cultivators subject to condition that yield is not below 90% of prescribed level.

Incentives:

- i. If the yield of produce is upto 110% of the prescribed yield limit, 2% additional incentive shall be given to the cultivator over and above the subsidy amount.
- ii. If the yield is more than 110%, additional incentive of 4% over and above the normal subsidy shall be paid to cultivator.

Cultivation Models

The arrangements for engagement of farmers/cultivators, shall be regulated under:-

- (i) **Cluster mode**
- (ii) **PPP-mode**
- (iii) **Individual farmer mode**

The plantation cluster shall be designed based on the geo-climate conditions and market demand etc. The plantation species shall as for possible, would be mix of perennials tree species, with herbs and shrubs as per standardised plantation models details of some of the indicative plantation models are given in the annexure.

The implementation framework shall comprise of:

Action Plan

The project shall be implemented in 2 years, starting from 2020-21 to 2021-22.

Project shall have following 3 components: -

- 1 Cultivation of Medicinal Plants, including development of plantation corridor of medicinal plants along the banks of Ganga.
- 2 Post Harvesting Management.
- 3 Establishment of 5 Regional Mandis (marketplaces).

State Implementation Agency:

For each state/ UT an implementation agency (SIA) shall be nominated which may be the State Medicinal Plant Board, State Horticulture/Forest department etc. Its role and responsibility would be to ensure coordination, at different levels, nominate Regional Facilitation Centers, recommend the work proposals for sanction and oversee and monitor its implementation.

Regional Facilitation centre. (RFC)

- To facilitate the implementation of work in a district/ group of districts. RFC will be managed by a self-help Group / NGO / FPO / Cooperative which has the expertise and experience of working in the medicinal plants sector.
- The RFC shall establish Cluster of Farmers/producers who are willing to pool their land for taking up cultivation. It shall organize programmes for education, awareness generation and training of farmers registered in the cluster to develop capacity to take up the work of plantation and related activities.
- The RFC will extend continuous technical support to the farmers through field visits and on- site demonstration. It will support in arranging QPM/other inputs,

technical knowhow in GAP/GCP, post-harvest management, market up linking and issues like regulatory permissions etc for the farmers.

- RFC shall anchor the establishment of post-harvest handling centers with facilities like primary processing/ chopping, drying courtyards, covered drying facilities, solar dryers, weighing scale, godowns.
- The testing and certification as per approved protocols shall be supported through identified testing agencies which shall be notified for each cluster. Wherever required, mobile testing vans may be introduced to cover one or more clusters.
- The district level post-harvest management centers shall be integrated with regional Mandis for seamless marketing support. The existing infrastructure in post-harvest management practices shall be rationalized as per needs and wherever required; it would be strengthened / augmented.

Crop Insurance Cover:

To derisk and protect the interests of Farmers against vagaries of nature, the cultivation of medicinal plants shall be brought under the ambit of Pradhan Mantri Fasal Bima Yojna if possible. Otherwise IRDA approval shall be taken for inclusion of medicinal plants crops under insurance schemes.

The operational guidelines along with cost norms for various activities involved in the cultivation model are given in the annexure.

2.) Increase in the livelihood of farmers:

Backward integration as alternative / solution to Access & Benefit Sharing (ABS): Backward integration is a form of vertical integration in which a company expands its role to fulfill tasks formerly completed by businesses up the supply chain. Backward integration provides higher returns to the farmers and local communities. For example, out of Rs. 15,000 Cr estimated RM turnover value only 40-45% will be the farmer / local community share while rest is with middlemen in the current scenario. The traders / aggregators make major profit (100-150%) out of this deal. Through backward integration, the manufacturer(s) and the farmer(s) will

have an MoU indicating buy-back guarantee. In this process there is a definite scope for the farmer to double his income. Out of Rs. 15,000 Cr, 40% is equal to Rs. 6,000/- Cr per annum. Even if 60% target is achieved, in the next 18 months more than Rs. 5,000 Cr money will reach the farmers / local communities which doubles their income without a new scheme. This amount will be almost 8-10 times to the **Access & Benefit Sharing (ABS)** proposed by the NBA (National Bio-diversity Authority). At 5% (highest rate), the total ABS would be Rs. 750 Cr for the entire country. Whereas backward integration provided better livelihood. Therefore, backward integration should be the focus than ABS. The AYUSH industry will also be happy. The MSMEs will continue their purchases through proposed Mandis / *Oushadhi-dham* for their needs or they may also have MoUs with the small-marginal farmer clusters.

3.) Establishment of Mandis (Oushadhi-dham) to up linking farmers & market:

Marketing and supply chain management of medicinal plants is crucial for sustenance of the sector. For strengthening the marketing infrastructure assistance will be given for herbal collection and retail outlets, upgradation/creation of infrastructure at the village level, District/State agriculture mandis for trading of medicinal plants. These mandis are designated as *Ouhadhi-Dham* (abode for medicinal raw material).

NMPB will also support Market Promotion, Market Intelligence and Buy-back Interventions through e-charak (It is an online virtual platform www.e-charak.in and a mobile application for medicinal plants with a view to provide an online market portal for trade of medicinal plants) and having liaison with e-NAM (National Agriculture Market or e-NAM) for online trading which facilitate farmers, traders and buyers with online trading in commodities. e-NAM is also helping in better price discovery and provide facilities for smooth marketing of their produce.

A network of five (5) regional mandis will be established in different zones viz., (East, West, North, South, and Central) to provide market infrastructure for farmers/ collectors/ traders and industry involved in medicinal plant sector. The

proposed regional Mandi per unit cost may be up to Rs. 50 Cr. Efforts will be made to integrate these mandis with Agricultural produce market committee (APMC), wherever available, to facilitate pan India trade in medicinal plants, providing better price discovery through transparent auction process based on quality of produce along with timely online payment.

The major activities under this program will be:

- a. e-Charak:** It is an online virtual platform www.e-charak.in and a mobile application for medicinal plants with a view to provide an online market portal for trade of medicinal plants. An attempt will be made to connect the farmers with the e-Charak and with the e-NAM (National Agriculture Market or e-NAM) for online trading which facilitate farmers, traders, and buyers with online trading in commodities.
- b. Model Mandis:** Already Neemuch Mandi APMC has allocated 17 acres land in Madhya Pradesh. Another 5 acres are being procured for Baddi Mandi (HP). South, East, and West Mandis are also under process. They will be linked with e-NAM and e-Charak.
- c. Integration of APMCs** across the country through a common online e-NAM Portal, a market platform has been envisaged to facilitate pan India trade on herbal raw materials.

Marketing Infrastructure:

- The main objectives of providing assistance under this component are:-
 - To strengthen infrastructure of wholesale markets, agriculture mandies for marketing of medicinal plants.
 - To set up herbal collection and retail outlets wherever they do not exist.
 - To strengthen linkages between farmers and industry/traders.
 - To disseminate information on market prices, market trends to enable farmers in selection of appropriate medicinal crops.

Under this component herbal collection and retail outlets to be set up at the village level can be given assistance up to Rs 20 lakhs. Assistance will also be available for upgradation / creation of infrastructure in the agriculture Mandis for trading of medicinal plants wherever such Mandis exist at the village level. Similarly, assistance will be provided to District / State agriculture Mandis for creating and upgrading physical infrastructure for trading of medicinal plants. NMPB will support 1. *Market Promotion* 2. *Market Intelligence* 3. *Buy-back Interventions*.

Market Promotion - In marketing, promotion refers to any type of marketing communication used to inform or persuade target audiences of the relative merits of a product, service, brand or issue. It helps marketers to create a distinctive place in customers' mind. The aim of promotion is to increase awareness, create interest, generate sales or create brand loyalty. It is one of the basic elements of the market mix, which includes the four Ps, i.e., product, price, place, and promotion (McCarthy & Jerome 1964).

Market Intelligence - Market intelligence is the information relevant to a company's market - trends, competitor and customer (existing, lost and targeted) monitoring, gathered and analyzed specifically for the purpose of accurate and confident decision-making in determining strategy in areas such as market opportunity, market penetration strategy, and market development (Cornish S L 1997).

Buy-back Interventions – Buy-back interventions or Contract Farming is the mechanism where the farmers have a guaranteed purchase of the produce after harvesting at a pre-determined or mutually agreeable price.

Initiatives for providing Mandies are aimed to:

1. Assure remunerative and relatively stable price environment for existing & new farmers/growers which will induce them to increase production of medicinal plants to support the current domestic and international demand & supply chain.
 2. It will provide a specific space and marketing facilities for medicinal plant based raw materials at Mandi level in public private partnership.
 3. Ensure transparency in pricing system and transactions taking place in market area to industries and their transparency in pricing system;
 4. Support for proper documentation of base line data pertaining to arrivals and rates of raw produce brought into the market area for sale; and
 5. Provide better marketing of the agricultural produce especially medicinal plants based raw materials
 6. Ensuring direct contract of the producers-farmer and the consumers and thereby enhancing the distributional efficiency of the marketing system
 7. Increase the profitability of the medicinal plants based raw materials for the produces by minimization of marketing costs and the margin of the middlemen
 8. Ensure the timely availability of the medicinal plants based raw materials at reasonable price to the consumers
 9. Provide business techniques to the farmers so that in the long-run they may adopt these practices for other crops and enterprises too.
- Farmers/collectors will be encouraged for using Mandis having transparent online pricing mechanism and linkage with stakeholders' viz., traders and manufactures.
 - The proposed AYUSH Mandis will be developed on PPP mode with state government of the respective place. State government may develop AYUSH Mandis through AYUSH department or through suitable department.
 - DPR for each Mandi having implementation plan will be submitted by state governments to the Ministry of AYUSH. The expert committee will review the DPR and implantation plans submitted by the state and may also recommend a model DPR along with implementation plan to AYUSH for uniform regional AYSH Mandis.
 - These Mandis once developed, will be run in PPP mode having federation comprising on elected representatives of farmers, collectors, traders and

manufactures of medicinal plants sector under the supervision of AYUSH or selected department of the state.

- A board will be constituted to decide the tariffs and other issues along with maintenance of the Mandi having representation of all the related departments and elected representatives and members of federation. The board will.

NEED FOR MANDI DEVELOPMENT AGENCY / SERVICE PROVIDER

- To establish a mandi planning and implementation requires innovative strategies
- To provide balance between supply driven planning & implementation done at project initiation stage and subsequent demand driven planning & implementation that would arise at the later stage.
- To empower farmer groups and networks to plan & implement on a need-based market driven approach.
- To handle the entire implementation cycle starting from stakeholder's mobilization to consolidation of activities.
- To identify the potential areas for collection centers and common service center.

OBJECTIVES OF MANDI DEVELOPMENT AGENCY / SERVICE PROVIDER

- To promote direct purchase from farmers /farmers' association at Mandi.
- To involve private, public and cooperative sectors in an integrated and concentrated approach for developing MAPs specific value chain system with end-to-end facilities for production, processing, storage and marketing.
- To address the gaps in cultivation, wild collection, primary processing, marketing and certification for development of MAPs specific Value Chain.
- Building a database of resource persons and resources institutions for the Producer companies, networking them and making these persons and institutions available as and when required.
- Mentoring, backstopping and monitoring effectiveness of the Manufacturers or producer companies on regular basis and revising and adapting planning & implementation arrangement to respond to the emerging needs and demands.

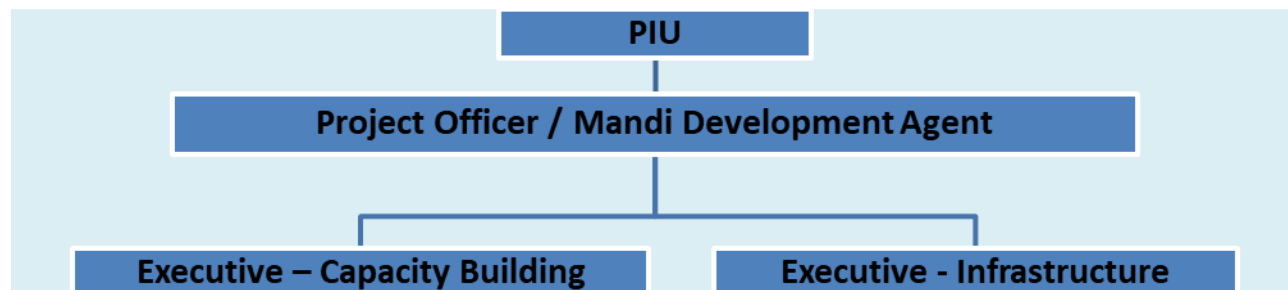
- To maintain a strategic buffer stock that would discourage hoarding and unscrupulous speculation.
- To protect consumers by supplying such commodities at reasonable prices through calibrated release of stock.
- To develop MAPs produce specific local Mandies of processing units with inbuilt mechanism for testing, certification, storage etc.
- To develop brands/labels for MAPs products and facilitate strong market access under the ownership of MAPs grower's organizations/cooperative societies.
- They will also serve as single window clearance to promote trade and export by having all the stakeholder's departments' offices at one place.

SPECIFIC DELIVERABLES BY THE SERVICE PROVIDER/AGENCY

- Diagnostic study and social mapping using participatory methods like participatory rural appraisal (PRA) techniques & tools.
- Awareness campaigning through individual contact and small group meeting, and trust building activities and group and Mandi envisioning and vision validation.
- Identification of target / affinity groups.
- Identification and training of group resource persons and book-keepers.
- Conversion of target/affinity members into groups.
- Assisting and facilitating the groups in preparation of byelaws, selection of group representatives, about time and place of meeting, naming of the group, about group activities, with emphasis on group marketing and bulk purchase of agriculture inputs
- Identification and launching of group activities like bulking of produce for marketing, bulk purchase of inputs, activities under contract farming etc.,
- Capacity building in identified activities.
- Establishment of accountability system
- Launching thematic communication campaign focusing on Mandi concept.
- Establishing partnerships & linkages with private and public sectors.
- Training of representatives/ members for managing business viability.
- Organizing exposure visits of group representatives/ group members.

- Organizing workshops/seminars/Field days.
- Assisting the groups in identification of Mandi level activities.
- Assisting and facilitating in preparation of Byelaws for Mandi level institutions.
- Capacity building of Mandi & Mandi representative.

ORGANIZATIONAL STRUCTURE OF PROJECT IMPLEMENTATION UNIT (PIU)



GOVERNING BODY OF PIU

Official	Designation
Secretary, Ministry of AYUSH	Chairman
CEO, NMPB	Member
Dy. CEO, NMPB	Member
Deputy Director Horticulture,	Member
Secretary, APMC,	Member
Representative SMPB	Member
Representative RCFC	Member
Independent Technical Expert	Member
Chairman, Service Provider Agency	Member
Representative, Medicinal Plant Trader	Member
Representative, Medicinal Plant Processors / Association	Member

FUNCTIONS OF THE PROJECT IMPLEMENTATION UNIT (PIU)

- Overall planning of Project implementation schedule, recruitment of staff and procurement of services required.
- Overall management and follow-up on the implementation of the Project by various agencies involved, as well as ensuring overall coordination between them.

- Preparing financial plan and annual budget for the project, ensuring availability of financial and human resources for successful implementation of the project and
- Organizing all the project activities and interventions on the basis of work plans, progress reports including outputs and inputs indicators.
- Back-stopping arrangements for the provision of technical assistance and consultancy related to business development, adoption/adaptation of and access to technology, promoting group action for development of value chains, linkages, producers' companies and coordination among stakeholders.
- Ensure accountability for Project funds assigned for the Project and also ensure proper audit of their utilization in accordance with agreed norms of accounting and audit standards to be followed.
- Ensure participation of all the stakeholders including small and marginal farmers' in the whole value chain for the medicinal plants.

ROLES & RESPONSIBILITIES OF PIU

- Mobilization of growers and producers for joint endeavor.
- Preparing the Annual Business Plan in consultation with all the project stakeholders for implementing project components and sub-components and obtaining necessary approvals of the PIU.
- Ensuring close coordination between NMPB, PIU, Directorate of Horticulture, GoMP, involved, banks and financial institutions, research institutions and other agencies involved in implementing project components and sub-components.
- Facilitating various stakeholders in preparing proposals related to medicinal plant production, post-harvest infrastructure development, training and other activities for forwarding these to NMPB and Banks for grant and loan approval.
- Establishing and implementing proper monitoring, reporting and audit arrangements for achieving objectives of the integrated business model.
- Organizing regular meetings of PIU as well as facilitating interactions between the key stakeholders involved such as Producers' company in implementing sub-components.
- Managing and supervising the work of the professional and other staff of PIU.
- Any other activity felt suitable by the PIU members / stakeholders for increasing business, providing services etc. to the stakeholders.

STRUCTURE / HUMAN RESOURCE REQUIREMENT

- Team leader: Coordination with Project Implementation Unit (PIU), Mandi Board and other experts as needed, provide strategic support for market linkage issues, rural marketing, legal issues for producer group registration. Facilitate field implementation in tandem with the PIU.
- Experts – Subject Matter specialist: For specific areas like strategic planning, and training. Institution Mandi development organization, market linkage with trade and industries, create partnerships with potential buyers, suppliers of inputs and other services who might co-operate with the Mandi, linkages with financial institutions and other knowledge institutions.
- District Task Managers: Hand holding support for all the activities and deliverables as per the ToR and in association with state level subject matter specialist.
- Mandi organizers: Field level facilitation team, who would be directly working in the Mandi implementation cycle, with the groups

MARKET INFORMATION AND INTELLIGENCE SYSTEM (MII)

- Integrated Market Intelligence & Information System, which could serve through e-Charak, Mandis will also be linked with e-NAM.
- Marketing of produce, production systems and technologies, weather, and other production related aspects.
- Information of demand and supply situation at local, national & international level.
- Information related to market prices at local, national & international level.
- Community mobilization and awareness among the stakeholders.

INFRASTRUCTURAL FACILITIES AT MANDI

Activity	Size (m)	Quantity	Area Sqm
PLOT AREA			23780
AUCTION PLATFORM / DRYING SHED	30 X 15	6	2700
WAREHOUSES	12 X 12	12	1728
LOADING / UNLOADING PLATFORMS	24 X 3	6	432
LOADING / UNLOADING TRUCK BAYS	64 X 8	6	3072

SHOP BLOCK				
SHOPS	6 X 4	50		1200
CIRCULATION VERANDAH	100 X 4	2		800
ADMINISTRATION				
OFFICE	30 X 20	1		600
UTILITIES/ FACILITIES				
PRIMARY PROCESSING CENTRE	60 X 15	3		2700
PLOT AREA				23780
AUCTION PLATFORM / DRYING SHED	30 X 15	6		2700
WAREHOUSES	12 X 12	12		1728
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UTILITIES/ FACILITIES				
PRIMARY PROCESSING CENTRE	60 X 15	3		2700

DIVISION OF FACILITY INTO VARIOUS SECTIONS

- Loading and Unloading Bay
- Separate Auction Blocks
- Primary processing facility (Sorting, cleaning, Grading and Packing)
- Humidity Controlled Storages (Warehouses)
- Wholesale Shops
- Administrative Section
- Other facilities (Internal Roads, Parking Area, Site Entry and Exit, Public conveniences)

PROJECT COST FOR ESTABLISHMENT OF REGIONAL MANDI

S. No.	Total Construction / Development	Rs.(in Lakhs)
1	Basic Cost of land	53.52
2	Land Leveling, Cutting & Filling	38.61
3	Green Area	1.89
4	Plantation	9.9
5	Boundary wall / Fencing	36.63
6	Entry Points & Gates	13.2
7	Signage	3.3
8	Parking	11.88

9	Internal Roads	282.54
10	Drainage & Sewage Lines	84.75
11	Electric Poles	23.76
12	Shop Construction	277.2
13	Circulation Verandah	132
14	Block A -Auction platform / drying shed	118.8
15	Warehouses	133.05
16	Loading / unloading platforms	23.76
17	Loading / unloading truck bays	33.78
18	Block B -Auction platform / drying shed	118.8
19	Warehouses	133.05
20	Loading / unloading platforms	23.76
21	Loading / unloading truck bays	33.78
22	Block C - Auction platform / drying shed	118.8
23	Warehouses	133.05
24	Loading / unloading platforms	23.76
25	Loading / unloading truck bays	33.78
26	Office, training hall, canteen	143.22
27	Primary processing centre	623.7
28	Laboratory	83.16
29	Toilet blocks	26.4
30	Dg set platform	1.98
31	Security post	1.5
32	Weigh Bridge	4.74
33	Sorting & Grading System (incl. Colour Sortex & Packaging machine)	363
34	Herbs powder plant	429
35	Processing plant for other products / Steam sterilization unit	495
36	Laboratory equipment's	150
37	Electronic Weighing machines	6.93
38	Pallets	118.8
39	Office Furniture & Computer Systems	6.6
39	Office Furniture & Computer Systems	6.6
40	Weigh Bridge	26.4
41	Fire Fighting Equipment	6.6
42	D.G.Set	22.29
43	Transformer, Feeder & Electrical Equipment's	66
44	Water Distribution System	33
45	Communication System	3.3
46	Administrative Overheads	19.08
47	Salary & Wages	64.11
48	Interest During Construction Period	132.78
49	Consultancy & Architect Fee	90.18
50	Deposits For Electricity & Telephone Exchange	31.8
51	Contingency / Apportionment	
	Grand Total	4846.92

DESIGNING OF BUILDINGS

- Provide adequate working space and storage room to allow for satisfactory performance of all operations.
- Facilitate efficient and hygienic operations by allowing a regulated flow in processing from the arrival of the raw medicinal plant materials at the premises to the dispatch of the processed medicinal plant materials.

- appropriate control of temperature and humidity in warehousing areas.
- Permit the separation by partition or other means of processes that may cause cross contamination, especially to isolate dirty areas (drying and milling) from clean areas.
- Permit control of access to different sections, where appropriate.
- Permit easy and adequate cleaning and facilitate proper supervision of hygiene.
- Prevent the entry of environmental contaminants such as smoke, dust, etc.
- Prevent the entrance and harboring of pests, livestock, and domesticated animals.
- Where appropriate, prevent direct sunlight from entering a particular section.

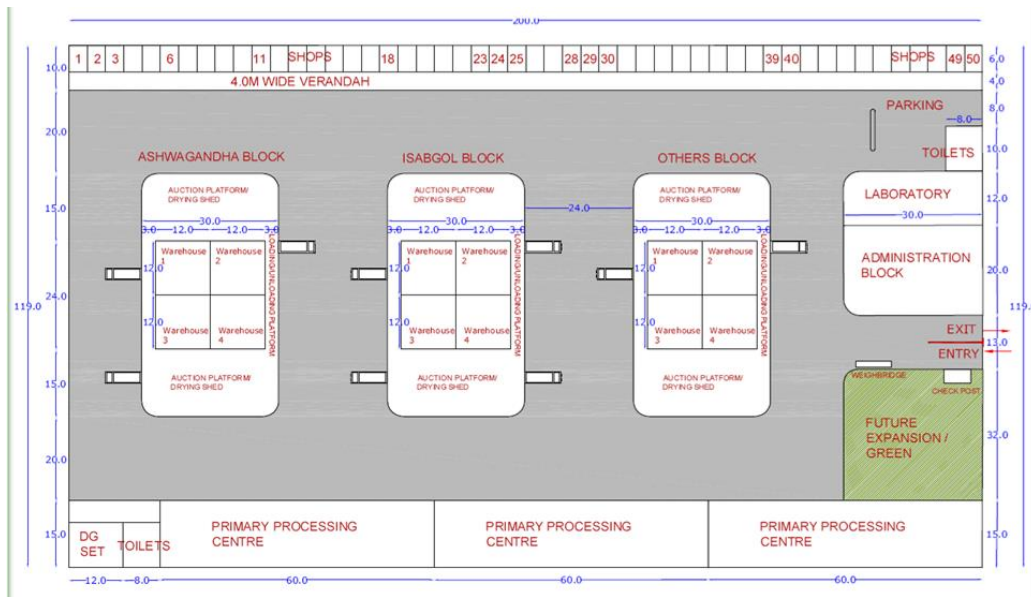
ESTIMATED PROFITABILITY STATEMENT (Revenue)

The market volumes are expected to be around 8090 MT in the first year, going up to 11460 MT by 10th year of operation. Based on the above analysis throughput of the facility has been estimated at 40 MT/day amounting to 11460 MT/annum of throughput.

Following is the profitability statement of Regional Mandi:

PROFITABILITY STATEMENT Particulars	Rs. In Lakh			
	Year 1	Year 2	Year 3	Year 4
INCOME	469.34	487.01	506.83	526.13
Mandi Fee	56.79	60.01	63.52	67.31
Entry Fee	0.93	0.98	1.03	1.08
Lease Rentals	56.1	56.1	56.1	56.1
Maintenance Charges	69.52	69.52	69.52	69.52
Charges from weigh bridge	15.62	16.72	17.88	19.14
Use Charges from processing center (Rs/MT) (Processing + packaging)	252.9	265.5	279.9	293.4
Warehouse storage charges	9.24	9.9	10.56	11.22
Income of lab	0.5	0.54	0.58	0.62
Interest earned on security deposit	7.74	7.74	7.74	7.74
EXPENDITURE	81.83	89.1	96.58	104.15
(1) VARIABLE	41.86	43.47	45.22	47.12
Kisan Sadak Fund	28.39	30.01	31.76	33.65
ELECTRICITY COST	10.57	10.57	10.57	10.57
FUEL COST	2.89	2.89	2.89	2.89
(2) FIXED	39.98	45.63	51.36	57.04
ADMINISTRATIVE /OFFICE EXP	5.16	5.42	5.69	5.86
SALARY	21.37	22.44	23.56	24.74
REPAIR & MAINTENACE	8.66	12.99	17.32	21.65
INSURANCE	4.79	4.79	4.79	4.79
MARKETING & COLLECTION EXPENSES	-	-	-	-
GROSS PROFIT	387.51	397.91	410.25	421.98

ARCHITECTURAL DESIGN OF REGIONAL MANDI OF MEDICINAL AND AROMATIC PLANTS IN INDIA



Indian trade being mostly non-regulated; the Demand and Supply data and a portal on MAPs trade will play an important role in this. Certifications such as ORGANIC and FAIR TRADE would promote domestic trade as well as IMPORT-EXPORT of herbs. Undertake a more in- depth global overview of the demand and supply of medicinal plants, herbal products and herbal drugs in order to clarify market issues and consider more effective solutions. Many of the issues require market-specific analysis because of the differences in market conditions, approaches used, and materials and products being focused on. Case studies of successful marketing approaches may help other organizations or countries.
