



बिहार सरकार
कृषि विभाग

कृषि रोड मैप

2012-2017





“मेरा सपना है कि हर भारतवासी के थाल में
बिहार का एक व्यंजन हो।

— नीतीश कुमार
माननीय मुख्यमंत्री, बिहार

Chapter-7

Plantation & Environmental protection

1. Vision:

An important component of the Road map for development of agriculture in Bihar is raising tree cover. The current tree cover in Bihar is 9.79% of total geographical area (as per FSI State of The Forest Report 2011), out of which approximately 3% is outside the recorded forest area. The aim of the mission is to raise the tree cover from the current 9.79 % to 15% over the next five years. To achieve this goal 5.3% of the net geographical area outside forest has to be brought under tree cover. It means that approximately 4600 sq km (4.6 lakh ha) of area is to be brought under additional tree cover. This is an extremely challenging task due to the immense pressure on land due to dense population and the pre-eminence of agriculture in the economy of the people. Since there is no scope to expand forest area, the remaining area has to be from non forestland i.e farmland. The Haryali Mission will have following aims :

- Raising the tree cover in Bihar to 15% by the end of 2017.
- Development of watersheds, soil and moisture conservation over 2000 sq km of forest areas which will include rehabilitation of 1000 sq km of degraded forests by plantation.
- Rejuvenation of forest areas of Bihar by raising the quality of forest cover.
- Providing additional/ enhanced income to farmers through farm forestry.
- Providing means of livelihood to BPL families through Vriksha Patta of the trees being planted as part of the mission.
- Increasing the availability of forest produce for meeting the domestic needs.
- Making available raw material for wood based industries for strengthening industrial development
- Establishing environmental stability and negating the negative effects of climate change
- Special plantation along embankments, canals and areas not suitable for agriculture

2. STRATEGY:

The strategy to achieve the above vision shall be as follows:

- Development/conservation of environment in forest areas and implementation of soil and moisture conservation to prevent soil erosion along with increasing the productivity of forest land by improving the stocking/quality of forest lands through rehabilitation measures.
- Raising of plantations on Government and private lands including wastelands.
- Farm forestry to supplement/enhance farm income.
- Involvement of BPL families in protection of plantations to ensure security of plants and provide supplemental income to the BPL families.
- Making available good quality planting material from Government nurseries, farmers' nurseries and private nurseries
- Raising of successful plantation of appropriate species depending on the location, local & market requirements

3. Programmes:

(a) **Rejuvenation and improved stocking of existing forest lands**

This shall involve following detailed strategy:

- Converting 1000 sqkm (100000 Ha.) of degraded forest by 2017 into dense forest, by following different strategies for the areas, as per availability of existing root stock
- Areas having negligible root stock shall be afforested by intensive plantation of 2500 plants per ha.
- Areas having root stock shall be cleaned by cropping the bushes and gap filling by approx. 1000 plants per ha.
- Areas having good root stock shall be developed into good tree stock by Silvicultural operation and trench fencing of the area.
- A total of 1025 lakh plants will be planted.

(b) **Watershed Development:**

- Watershed treatment of 2000 sqkm (200000 ha) of forest land including 1000 sq km shown above, to retain moisture and bring back green cover) which will be based on Guiding Principles on Watershed

Development Issued by Rural Development Dept. in 2008. The programme will be implemented with following main objects,

- Livelihood development & in-situ conservation of moisture.
- Cluster approach for minor watershed development.
- Scientific approach including information technology, website development and remote sensing.
- Technical expertise will be developed by training of staff and holistic approach.
- Scientific innovations such as ICT, website development and remote sensing will be used for mission activities.

(c) Raising of plantations on Government Lands including wastelands: To achieve this objective following strategy will be adopted,

- Plantation on about 2200 Km river embankment (43.60 lakh plants)
- Plantation on about 6235 Km canal embankment (83.00 lakh plants)
- Road side plantation along 4000km RCD roads (53.40 lakh plants) and 38000 km of RWD roads (380 lakh plants)
- Block plantation on Government wasteland, waterlogged areas and urban forestry over 33600 ha (210 lakh plants)

(d) Farm forestry to supplement/ enhance farm income

- Planting of 600 lakhs plants on farmers land along boundaries @ 3m intervals and block plantations at 6mx10m. At a notional tree cover @ 1ha/150 trees, it will cover 40000 ha.
- Popularisation of short term (6-10 yrs) varieties of plants among farmers, such as Bamboo, Poplar, Euclapytus, Semal, Kadamb, Sahtoot, Arjun -the last two for silk cocoon rearing
- Making available other medium term (15-20 yrs) species like Gamhar and Shisham as well as long term (25 years) species like Sagwan, Mahogany to farmers, specially large farmers
- Almost 75-80% of the additional tree cover shall be Secured through farm forestry endeavors.
- Nurseries for almost 80% of the plants to be used in farm forestry are to be raised through Kisan nurseries, thus giving them additional income

(e) Involvement of BPL families in plantation to ensure security of plants and supplemental income to the BPL families:



- All canal side, river embankment and roadside plantation to be given to BPL families on tree patta
- Plantations on Government wastelands to be given to BPL families on tree patta
- The families shall be involved right from plantation stage to ensure security of the plants
- Free distribution of bamboo plants and other plants to those BPL families who have their own homestead land for plantation

(f) Making available good quality planting material from Government nurseries, farmers' nurseries and private nurseries

The most important component of the mission is to make available good quality planting material. This shall be achieved through the following sources:

- Forest department nurseries will raise 4.50 crore plants. This will be done in 64 nurseries with an area of 63.5 Ha. of existing permanent nurseries, 100 nurseries on land made available by the Horticulture department. This will be supplemented by 3 existing Hi-tech nurseries and 8 Hi-tech nurseries in the process of being set up.
- Kisan nurseries will be raised in 9940 acres which will produce 5.82 crore ETPs of Poplar. These plants will be purchased by the department at rates to be fixed by the department for distribution under agro-forestry.
- Plants, mainly fruit bearing trees from the nurseries of Horticulture department will also form a part of the Hariyali mission
- Private nurseries: Private entrepreneur will be encouraged to establish nurseries with a buy back arrangement. 2350 nurseries with a capacity of 20000 each will be established to produce 4.70 crore plants.

(g) Selection of appropriate species

- Selection of species will depend on the location, utility and the bio-geographical conditions. List of species are as below:
- **Farm Forestry:** Poplar (*Populus deltoids*), Bamboo, Eucalyptus, Kadam, Semal, Gamhar, Sagwan, Shisham etc
- **River embankments:** Bamboo, Eucalyptus, Kadam, Semal Shisham, Fruit bearing trees etc.
- **Canal embankments:** Bamboo, Kadamb, Jackfruit, Aanwla, Jamun, Gamhar, Semal, Sahjan, Shisham, Eucalyptus, Arjun, Sagwan, etc

- **Roadside Plantation:** Shisham, Kadamb, Jackfruit, Sahjan, Mango, Semal, Aanwla, Jamun, Eucalyptus etc
- **Waterlogged areas:** Arjun, Eucalyptus, Jamun and Kadamb
- **Urban plantation:** Ornamental plants such as Gulmohar, Amaltas, Peltophorum, Jacaranda, Kachnar etc.
- **Schools:** Jackfruit, Sahjan, Neem, Jamun, Aanwala, Mango etc.

Wastelands: Mixed species as per soil quality

Degraded Forest land:

- **Good quality soil** – Gamhar, Bamboo, Sagwan, Shisham, Kadamb, Karanj, Aanwla, Neem
- **Hard soil** – Acacia, Neem, Karanj, Chilbil, Khair, Aanwla
- **Waterlogged areas** – Arjun, Jamun, Kadamb

While selecting species for plantation on forest lands care will be to maintain the local biodiversity.

- 4. Infrastructure support for the Mission:** The project will be executed in a mission mode with the following structure for its effective implementation. The mission shall be called Hariyali Mission.

(A) Governing Body

Chairman: Chief Minister, Bihar

Dy. Chairman: Minister, Environment & Forest Dept.

Members: Ministers of Finance/Agriculture/ Rural Development/ PWD/ RWD/ Irrigation/Panchayati Raj/Minor Irrigation/Chief Secretary/ Development commissioner.

Member Secretary:

Principal Secretary/ Secretary, Environment & Forest

(B) **Executive Committee**

Chairman: Chief Secretary

Deputy Chairman: Development commissioner.

Members: Principal Secretary/ Secretary of Finance/Agriculture/ Rural Development/ PWD/RWD/Irrigation/ Panchayati Raj/ Minor Irrigation/ Environment & Forests/ Principal Chief Conservator of Forests



Member Secretary: Mission Director

(C) Execution Machinery

Mission Director	:	1
Additional Director	:	2
DFOs at functional level		
IIFM professionals at HQ. level	:	4
Post Graduate (Agriculture/Forestry) at District level	:	38
Graduates (Agriculture/Forestry) at Block level	:	534
One Vriksh Mitra on 4/5 per Panchayat	:	2200

5. PHYSICAL TARGETS AND COST

(i) Physical & Financial Targets for 2012-13 (Rs. In lakh)

S No	Form of Land	Component	Ha/KM	Plants (lakhs)	Outlay
1	Forest Land	Rehabilitation of Degraded Forest	17500 ha	135.00	3085.87
		Soil & Water Conservation	40000 ha		3000.00
2	Government land outside forest areas	River Bank	218 km	4.36	9040.85
3		Canal Bank	415 km	8.30	
4		Road side RCD Road		43.34	
5		Road side RWD Road			
6	Degraded Land	Wasteland & Waterlogged land & Urban Forestry (112000 Ha.)		21.90	
7	Farmers Land	Agroforestry along with Agriculture (includes administrative cost)		25.00	
		Total		237.90	15126.72

(ii) Physical & Financial Targets for 2013-14

(Rs. In lakh)

S No	Form of Land	Component	Area	Plants	Outlay
1	Forest Land	Rehabilitation of Degraded Forest	23000	185.00	7641.40
		Soil & Water Conservation	29600		3000.00
2	Plantation on Government land outside forest areas	River Bank		8.72	13751.13
3		Canal Bank		16.55	
4		Road side RCD Road		86.70	
5		Road side RWD Road			
6	Degraded Land	Wasteland & Waterlogged land & Urban Forestry (112000 Ha.)		42.00	
7	Farmers Land	Agroforestry along with Agriculture crop (includes administrative cost)		90.00	
		Total		428.97	24392.53

(iii) Physical & Financial Targets for 2014-15

(Rs. In lakh)

S No	Form of Land	Component	Area (ha.)	Plants	Outlay
1	Forest Land	Rehabilitation of Degraded Forest	23000	235.00	17823.92
		Soil & Water Conservation	40000		3000.00
2	Plantation on Government land outside forest areas	River Bank		10.90	17272.67
3		Canal Bank		20.80	
4		Road side RCD Road		108.33	
5		Road side RWD Road - 95000 Km			
6	Degraded Land	Wasteland & Waterlogged land & Urban Forestry (112000 Ha.)		52.05	
7	Farmers Land	Agroforestry along with Agriculture crop (includes administrative cost)		127.50	
		Total		554.58	38096.59

**(iv) Physical & Financial Targets for 2015-16****(Rs. In lakh)**

S No	Form of Land	Component	Area (ha.)	Plants	Outlay
1	Forest Land	Rehabilitation of Degraded Forest	24000	235.00	30093.42
		Soil & Water Conservation	40000		3000.00
2	Plantation on Government land outside forest areas	River Bank		10.90	19277.97
3		Canal Bank		20.80	
4		Road side RCD Road		108.33	
5		Road side RWD Road			
6	Degraded Land	Wasteland & Waterlogged land & Urban Forestry (112000 Ha.)		52.05	
7	Farmers Land	Agroforestry along with Agriculture crop (includes administrative cost)		142.50	
		Total		569.58	52371.39

(v) Physical & Financial Targets for 2016-17**(Rs. In lakh)**

S No	Form of Land	Component	Area (ha.)	Plants (In lakh)	Outlay (In lakh)
1	Forest Land	Rehabilitation of Degraded Forest	20000	235.00	35018.78
		Soil & Water Conservation	40000		3000.00
2	Plantation on Government land outside forest areas	River Bank		8.72	19880.40
3		Canal Bank		16.55	
4		Road side RCD Road		86.70	
5		Road side RWD Road			
6	Degraded Land	Wasteland & Waterlogged land & Urban Forestry (112000 Ha.)		42.00	
7	Farmers Land	Agroforestry along with Agriculture crop (includes administrative cost)		215.00	
		Total		603.97	57899.18

(vi) **Consolidated targets (2012-17):** The consolidated targets for the five years under haryali mission programme will be as follows,

(A) **Physical target**

S No	Type of Land	Component	Total Area (ha.)	Targeted area	No of Plants (in lakhs)
1	Forest Land	Rehabilitation of Degraded Forest and Soil & Water Conservation	350000 Ha	200000Ha	1025.00
2	Plantation on Government land outside forest areas	River Bank - 3629 Km	3629 Km	2200Km	43.55
3		Canal Bank - 10392 Km	10392Km	6235Km	83.05
4		Road side RCD Road - 8000 Km	8000Km	4000Km	53.40
5		Road side RWD Road - 95000 Km	95000Km	38000Km	380.00
6	Degraded Land	Wasteland & Waterlogged land & Urban Forestry (112000 Ha.)	112000 Ha	33600ha	210.00
7	Farmers Land	Agroforestry along with Agriculture crop (Assuming 80% of geo. area under Agriculture) Poplar-75% Other A & E group plants - 25%	75,33,120 Ha.	400000 ha	600.00
		Total			2395.00

**(B) Financial target :**

Component	Activities	Outlay (2012-17) (Rs in lakh)
Rehabilitation of degraded Forests	a. Plantation on blank area of forest @2500 plants/ha b. Plantation on partly degraded lands @ 1000 plants/ha c. Rehabilitation of good root stock @ 200 plants/ha	93663.39
Soil & Water Conservation in Moderately dense & Dense Forest area	For prevention of erosion and improving the water regime of a area by contour trenching & Gully plugging etc.	15000.00
Plantation outside forest areas (Cost per plant Rs 58.00 including nursery, planting and infrastructure)	Plantation & Nursery Cost - Raising of nurseries for 15.02 crore plants a. 4.5 Cr. in depar tmental nursery - for FD & Agroforestry b. 4.7 Cr. in private nursery - for Panchayat c. 5.82 Cr. in kisan nursery -for Agroforestry plantations.	62504.26
	Administrative Cost -	16718.75
	Total	187886.40
	Contingent 2%	3757.73
	Price Escaltion	55442.83
	Grand Total	247086.96