

Publication No.;855
Evaluation Study No.:135



Evaluation Study of Rehabilitation of Degraded Forests Scheme in Haryana

Issued by:
Economic & Statistical Adviser
Planning Department, Haryana
2006

PREFACE

An Evaluation study entitled Rehabilitation of Degraded Forests has been conducted to ascertain the implementation and impact of the scheme in terms of employment generation and to suggest corrective measures to be applied for improvement.

The scheme which is a state plan ongoing scheme was introduced to the State Govt.during the year 1998-99. The primary object of this scheme is to provide the local people fuel wood, fodder, small timber and other minor forests produced. Conserving soil and moisture in situ, generating employment and reforesting the degraded hills are the other main objectives of this schemes. The study covers the implementation period from 2002-03 to 2004-05 of the scheme. A total area of 690 hect. was covered under plantation during 2002-03 to 2004-05.

The survey revealed that survival rate the plantation of 7 sampled sights was good in comparison to the survival rate in Manakpur herval park which was lowest. The percentage of Eucalyptus plant was highest. Besides during the course of survey some gaps were noticed in implementation of the scheme for which suitable suggestions have been given for rectification.

I am thankful to the Principal Chief Conservator of Forests, Haryana and his staff for their cooperation in supplying the required information/data necessary for the evaluation study.

The report has been prepared by Sh. Harjeet Singh, Research Officer with the assistance of Sh. Kehar Singh, Assistant Research Officer(Now Research Officer) under the supervision of Sh. Samar Singh Bhoria, Dy. Economic & Statistical Adviser and overall guidance of Sh. R.K. Bishoni, Addl. Economic & Statistical Adviser,Haryana.

It is hoped that the findings and suggestions made in the evaluation report will prove useful to the State Forest Department in the effective and smooth implementation of Rehabilitation of Degraded Forests Scheme. The information contained in the report may also be helpful to the planners, researchers and educationists.

Dated: 4-10-2006
Place:Chandigarh.

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CHAPTER-I

Introduction

God has created human beings, animals and forests. Trees are backbone of life on the earth as they purify the air and give us oxygen without which we can't live. They also give us food, shelter, medicines, fuel etc. They help to maintain the ecological balance and add beauty to the nature.

Man is continuously destroying the forest at a very fast speed to earn money, make buildings, industries and infrastructure to fulfill his basic needs. At the same time he forgets the fact that he is inviting disaster for himself as cutting trees result in global warming which is the major problem faced by the world. Planting trees is the only solution of this problem.

As per mandate of the national forest policy the hill and plain areas should have 66 and 33 percent forest cover respectively. But in Haryana forest cover is only 3.5 percent of the total geographical area of the state. Shisham and Kikar, the two of the most significant tree species are recording a severe decline all over the Indian subcontinent. Although several national and international seminars have been organized to assess the causes of mortality in these commercial valuable species, no specific causes has yet been ascertained. Besides, there had been excessive felling and grazing in the Shiwalik hills. This accentuated the problem of degradation of forest. The problem of soil erosion and degradation is all the more serious in southern parts of the State. Keeping in view of this, the rehabilitation of the degraded forest area is essential for environmental stability and to increase productivity under the scheme of rehabilitation of degraded forests. Hence a new component namely Rehabilitation of degraded forests was added during 1988-89. The primary objective of this component is to provide the local people fuel wood, fodder, small timber and other minor forest produce. Conserving soil and moisture in situ, generating employment and reforesting the degraded hills are the other main objectives of this component

1.1 Evaluation Study

The Economic & Statistical Organisation, Haryana took up the Evaluation Study "Rehabilitation of Degraded Forests in Haryana" as per decision taken by the Financial Commissioner & Principal Secretary to Govt. Haryana, Planning Department in the meeting held on 11.10.2004. The following are the objectives of evaluation of the scheme conveyed by the Forest Department.

- I. To assess the physical and financial performance of the scheme.
- II. To evaluate the adequacy of implementation mechanism including monitoring mechanism of the scheme.
- III. To study the impact of scheme in terms of employment generation to the local people.
- IV. To assess the factors contributory to the success of survival and protection of plantation done and also those contributory to mortality.
- V. To suggest measures for improving the performance of the scheme Including identification of areas for research and development.

1.2 Methodology

The study is based on primary and secondary data. The secondary data was collected from the State Forest Department and offices of three selected Divisional Forest Officers (DFO) viz. Ambala, Kaithal & Panchkula. Besides, discussions were also held with the officers/ officials implementing the scheme. For assessing the impact of the scheme, plantation raised during the year 2002-03 to 2004-05 was covered under the sample study.

1.3 Sampling Design and Coverage

The following sampling design was adopted for the sample study keeping in view the methodology of the study.

1. Out of 10 forest divisions, three divisions having maximum area covered under plantation were selected and out of 43 sites of the selected divisions 8 sites were selected on the random sampling basis for conducting the study.
2. Views of Divisional Forest Officers / Range Officers of selected divisions/ sites were obtained to ascertain various factors relating to the scheme.

1.4 Tools of the Study

Three schedules were designed for collecting requisite data and information for the study. Schedule 'A' was meant for obtaining data from DFOs. Schedule 'B' was used for obtaining the observation of the selected sites where the plantation work were taken up. In Schedule 'C' views of knowledgeable persons who were residing nearby villages of the selected sites of plantation were taken.

1.5 Reference Period

The requisite necessary data for the year 2002-03 to 2004-05 was collected from the Forest Department for the purpose of the study. The survey work was carried out in between October 2005 to November 2005.

CHAPTER – II

Programme Implementation

This chapter is devoted to analyse the implementation and achievement of the Rehabilitation of degraded forest,(RDF) scheme. The RDF is a state plan and on going scheme. The funds for implementation of this scheme are fully provided from the resources of the state government. The Forest Department allocates funds to the Divisional Forest Officers under this scheme for preparation of nurseries. Plantation is done on the Govt. land and Panchayat land. The scheme is being implemented in the 10 forest divisions of the State. The analysis given is based on the information collected from the Forest Department Haryana and relates to the year 2002-03, 2003-04 and 2004 –05.

2.1 Organisational Set-up

The RDF scheme is being implemented in the 10 territorial forest divisions of the State, each division is manned by a Divisional Forest Officer. The divisions have been sub-divided into forest ranges and a division has 3-4 ranges. Range is the unit of execution of plantation work and the Range Officer is the overall in-charge to carry out the work in the identified sites. He is assisted in his work at block level by Deputy Rangers and Foresters. A range comprises of blocks and block comprises of forest beats. The“ forest beat” is the smallest and grass root level unit and forest guard is in-charge of the beat. He is responsible for plantation, protection and maintenance of plants.

2.2 Norm of Plantation

The prescribed norm fixed for plantation is 1100 plants per hect. The eucalyptus plants were raised on ridges and distance of 1m x 1m of one plant to another plant was maintained. The other species of plants were raised in pits (45x45x30 cm.) and distance of 3mx3m was followed between the plants. The distance between one ridge to other ridge as well as one pit to other pit was maintained 3 meter.

2.3 Choice of Species

The selection of species for raising the plants (seedlings/saplings) to rehabilitate the degraded forest vary from place to place, depending upon climatic factors and soil condition. Species like Safeda (Eucalyptus), Khair (Acacia catechu), Shisham (Dalbergia sissoo), Neem (Azadirachta indica) Papri, Kikar (Acacia Nilotica), Allanthus, Teak (Tectona grandis), Chir (Pinus roxburghi), Toon (Odrelea toong), Bakain(Melia azadirach), Kadam (Anthocephalus cadamlia), Pilkhan (Ficus infactoria), Silver Oak (Grevillea Robusa), Mango (Mangifera indica), Amrood (Psidium gyava), Jammun (Syzyguim cuminii), Jammaoa (Syzygium cuminii), Anwla (Phyllanthus emblica), Imlī (Tamarindus indica), Bahera (T.bellerica), Harars, Jatropha (Jatropha hispida) etc. were planted as per the conditions prevailing in the area.

2.4 Maintenance and Protection of Plants

Survival as well as proper growth of plantation done under any forestry scheme is solely dependent on the maintenance and protection measures taken by the Forest Department. Water for plants is arranged locally or brought through water tankers. First irrigation is done immediately after plantation provided if it does not rain and second watering is done in winter. Replacement for dead plants is carried out in the second and third year in order to achieve the maximum plantation. The protection of plants from human and animals is also important. At gross root level forest guards have been assigned this task in their respective beats under their control.

2.5 Monitoring of Plantation

A separate Monitoring and Evaluation Division is functioning in Karnal under the overall control of DFO. The monthly progress reports regarding monitoring of plantation are being sent by DFO to concerned CCF, HQ. Haryana and appropriate action is being taken on these reports.

The instructions provided in the Red Data Book (Operational guide) by Food and Agriculture Organisation (FAO) 1986 Monitoring and Evaluation,

Manual of Social Forestry in India for conducting monitoring and evaluation are being followed year-wise.

2.6 Utilization of Funds

An outlay of Rs. 25.00 lakh, Rs. 41.60 lakh and Rs, 45.00 lakh was allocated under the scheme for the year 2002-03, 2003-04 and 2004-05 respectively. The following table depicts year wise outlay and expenditure incurred under the RDF scheme.

Table 2.1

Outlay and expenditure under Rehabilitation of Degraded Forests scheme.

(Rs. in lakh)

Year	Outlay	Expenditure	% of expenditure to outlay
2002-03	25.00	25.00	100.00
2003-04	41.60	41.60	100.00
2004-05	45.00	45.00	100.00
Total	111.60	111.60	100.00

The scheme is wholly financed by the State Government. The above table reveals that the forest department had utilized whole of the allocated amount in each year.

2.7 Area Covered under Plantation

The targets and achievements of plantation done under the Rehabilitation for Degraded Forests Scheme during the year 2002-03, 2003-04 and 2004-05 is given in the following table:-

Table 2.2

Target and achievement of plantation under Rehabilitation of Degraded Forests scheme during 2002-03 to 2004-05

(Area in hect)			
Year	Target	Achievement	Percentage of achievement
1	2	3	4
2002-03	198	198	100.00
2003-04	256	256	100.00
2004-05	236	236	100.00
Total	690	690	100.00

It can be seen from the above table that a target of 690 hect. of plantation for the year 2002-03 to 2004-05 under the RDF scheme was fully achieved. The plantation area during the year 2002-03 was 198 hect. The planted area during 2003-04 increased to 256 hect. due to more funds allocated under the scheme. The area during the year 2004-05 declined to 236 hect. as part of funds were utilized for maintenance purpose also.

2.8 Plantation of different Species

The species-wise number of plants raised during the 3 years viz. 2002-03, 2003-04 and 2004-05 has been given as under:-

Table 2.3

Species wise number of plants raised during the year 2002-03 to 2004-05.

Sr. No.	Name of species of plants	No. of plants			Total	Percentage to total
		2002-03	2003-04	2004-05		
1.	Eucalyptus(Safeda)	108600	93100	58450	260150	34.18
2.	Shisham	3350	34954	62923	101234	13.30
3.	Khair	13200	44800	33061	91061	11.96
4.	Kikar	60080	9750	2500	72330	9.50
5.	Teak	-	42900	17070	59970	7.88
6.	Neem	550	6720	17100	24370	3.20
7.	Papri	16450	2545	4050	23045	3.03
8.	Bamboo	-	18600	-	18600	2.44
9.	Bakain	670	1650	13730	16050	2.11
10.	Chir	-	6600	9400	16000	2.10
11.	Arjun	2150	850	8350	11350	1.49
12.	Anwla	-	3550	6480	10030	1.32
13.	Jamun	-	4400	5600	10000	1.31
14.	Toon	-	4400	4500	8900	1.17
15.	Allanthus	6000	-	2700	8700	1.14
16.	Jatropha	-	-	8200	8200	1.08
17.	Cassiasamia	4050	-	400	4450	0.59
18.	Silver Oak	-	17	2900	2917	0.38
19.	Miscellaneous	2700	6764	4379	13843	1.82
Amrood,Kajeli,Frans, Kadam, Gulmohar						
Total		217800	281600	261800	761200	100.00

The above table reveals that 761200 plants were raised under the scheme during three years 2002-03 to 2004-05, out of which 260150 (34.18%) Eucalyptus plants were planted. The number of Shisham plants were 101234 and Khair plants were 91061 i.e. 13.30 and 11.96 percent respectively of the total

planted plants. The percentage of Arjun, Anwla, Jamun, Toon, Allanthus, Jatropa, Cassiasamia, Silver oak and misc. plants as shown in the table was very low.

2.9 Employment Generation

Information regarding employment generated to the local people was collected. People were engaged in activities like preparation of ridges, digging pits, planting species and maintenance/ protection of species. The extent of employment generated by the department during the year 2002-03 to 2004-05 is set out in the table given below:-

Table 2.4
Employment generated under the RDF scheme during the year
2002-03 to 2004-05

Sr.No.	Name of district/ forest division	No of mandays generated			Total	% to total
		2002-03	2003-04	2004-05		
1	2	3	4	5	6	7
1.	Ambala	5655	6164	1544	13363	13.51
2.	Faridabad	3972	1230	602	5804	5.87
3.	Jind	3984	-	-	3984	4.03
4.	Karnal	-	-	-	-	-
5.	Kaithal	-	4884	13670	18554	18.76
6.	Kurukshetra	3062	2225	744	6031	6.10
7.	Panchkula	-	12671	13950	26621	26.92
8.	Sirsa	-	-	5548	5548	5.61
9.	Sonipat	2816	648	308	3772	3.82
10	Yamunanagar	-	9530	5680	15210	15.38
Total		19489	37352	42046	98887	100.00

The information given in the above table shows that a total number of 98887 mandays were generated during the year 2002-03 to 2004-05 by the 9 DFO's of the Forest Department. The maximum mandays i.e. 26.92% of the total were generated by Panchkula Divisional Forest Officer and minimum mandays i.e. 3.82% by the DFO Sonipat. The information of Karnal division was not supplied by the department.

CHAPTER - III

Field Survey

A sample study was conducted in three selected forest divisions namely, Ambala, Kaithal and Panchkula (at Morni-Pinjore DFO) out of ten forest divisions with a view to study the adequacy of implementation mechanism including monitoring mechanism and performance of the Rehabilitation of Degraded Forests scheme. The divisions were selected keeping in view the maximum area covered under plantation during three years i.e. 2002-03 to 2004-05 by adopting purposive method of sampling. The opinion of three Forest Divisional Officers, 8 Range Officers/Forest guards and 16 knowledgeable persons were also ascertained. The fieldwork of study was carried out during the months of October/November, 2005. The broad findings of the study are as under:-

3.1 Selection of Forest Division

There are 10 forest divisions in which the Rehabilitation of Degraded Forests scheme is being implemented. As many as 3 forest divisions out of 10 divisions were selected and has been shown in the following table.

Table 3.1
Selection of division
(2002-03 to 2004-05)

(Area in hect.)

Sr.No.	Name of forest division	Area covered	No. of site	Name of selected div.	No. of selected site
1	2	3	4	5	6
1.	Ambala	90	7	Ambala	2(28.57)
2.	Faridabad	38	4	-	-
3.	Jind	30	4	-	-
4.	Karnal	45	8	-	-
5.	Kaithal	120	17	Kaithal	3(17.65)
6.	Kurukshetra	50	9	-	-
7.	Panchkula	159	19	Panchkula	3(15.79)
8.	Sirsa	58	10	-	-
9.	Sonipat	25	3	-	-
10.	Yamunanagar	75	8	-	-
Total		690	89	-	8(8.99)

(Figures in brackets are percentages)

It can be seen from the above table that the maximum area of 159(23.04%) hect. was covered under plantation in Panchkula forest division followed by an area of 120 hect. (17.39%)and 90 hect. (13.04%) covered in Kaithal and Ambala forest divisions respectively. The selection of sampled site of the total sites constitutes 8.99%.

3.2 Sampled Sites

There were 43 plantation sites in the 3 selected forest divisions. A sample of 8 sites was selected at random out of the 43 sites for the purpose of this study. The sampled sites selected for examining the implementation and performance of the Rehabilitation of Degraded Forests scheme have been shown in table 3.2

Table 3.2

Division wise sampled sites under the RDF Scheme
(2002-03 to 2004-05)

Sr.No.	Name of division	Total (no.) sites	Sampled sites (no.)	Percentage to total sites
1	2	3	4	5
1.	Ambala	7	2	28.57
2.	Kaithal	17	3	17.65
3.	Panchkula	19	3	15.79
	Total	43	8	18.60

The data in the above table reveals that 18.60% of the total sites were selected. As many as 2 sites out of 7 i.e. 28.57% of Ambala division, 3 sites out of 17 i.e. 17.65% of Kaithal division and 3 sites out of 19 i.e.15.79% of Panchkula division were selected for survey purpose.

3.3 Plantation Area of Sampled Sites

The plantation under the scheme depends on the area available in various divisions as well as availability of funds. The extent of area planted in selected divisions and sampled sites during the year 2002-03 to 2004-05 is indicated in the table No. 3.3:-

Table 3.3
Plantation area covered in sampled sites
(2002-03 to 2004-05)

(Area in hect.)

Sr.No.	Name of forest division/sampled sites	<u>Area covered</u>			Total area covered	%age to total area
		2002-03	2003-04	2004-05		
1	2	3	4	5	6	7
<u>Ambala</u>						
1.	Bharog	20	-	-	20	20.41
2.	Manakpur Herbal Park	-	1	-	1	1.02
<u>Kaithal</u>						
1.	Saraswati Drain	-	-	30	30	30.61
2.	Deban Nagura Road	-	2	-	2	2.04
3.	Mahmoodpur Khabera Road	-	-	12	12	12.25
<u>Panchkula</u>						
1.	Thandog Reserve Forest	-	-	15	15	15.31
2.	Bir Shikargarh Mallah Reserve Forest	-	-	10	10	10.20
3.	Mirpur Reserve Forest	-	-	8	8	8.16
Total		20	3	75	98	100.00

During the period 2002-03 to 2004-05 the maximum plantation of 44 hectare was done in Kaithal division and minimum 21 hect. in Ambala division. As far as the area coverage of sampled sites is concerned the maximum area of 30 hect. (30.61%) of Saraswati Drain sampled site was covered under plantation followed by an area of 20 hect. (20.41%) and 15 hect. (15.31%) of sampled sites of Bharog and Thandog Reserve Forest respectively. Minimum area coverage of 1 hect. was found in sampled site of Manakpur Herbal Park of Ambala division.

3.4 Plantation Period

Primarily the survival, good health, crown etc. depends on the plantation period of any seedling. Keeping in view of this it was noticed during the course of field survey that plantation work was done normally in July and August in 7 sampled sites in the rainy season. Whereas plantation work in one sampled site i.e. Manakpur Herbal Park was completed in Oct/Nov 2003. The seedlings at this site thus have been planted in dry season thereby deviating the normal practice.

3.5 Modes/Technique adopted in the plantation

To know what mode/technique were adopted in the plantation while implementing the scheme, the surveyors visited the sites of the plantation and observed that species of eucalyptus plant were found planted/raised on ridges. The other species of plants were raised in pits. The distance between ridge to ridge and line to line was found 3 meter. The distance between the eucalyptus plant to plant was found 1 meter as per norm. The distance between plants of other species was found 3 meter.

3.6 Species-wise Plantation in the Sampled Sites

The selection of species of plants for raising in any forestry scheme varies from place to place, depending upon climatic factors and soil conditions. In order to know the selection of species adopted in the sampled sites, the information collected in this regard is displayed in the table given below:-

Table 3.4

Species wise plants raised in the sampled sites during the year 2002-03 to 2004-05

Sr.No.	Name of species of plants planted	No. of plants			Total	% to total
		2002-03	2003-04	2004-05		
1	2	3	4	5	6	7
1.	Eucalyptus	16500	2200	24200	42900	39.80
2.	Khair	5500	-	6900	12400	11.50
3.	Neem	-	250	10000	10250	9.50
4.	Chir	-	-	9400	9400	8.72
5.	Teak	-	-	7700	7700	7.14
6.	Bakain	-	-	7680	7680	7.12
7.	Arjun	-	200	4400	4600	4.27
8.	Toon	-	-	4500	4500	4.17
9.	Papri	-	-	2850	2850	2.64
10.	Anwla	-	150	2350	2500	2.32
11.	Jatropha	-	-	2100	2100	1.95
12.	Shisham	-	-	330	330	0.31
13.	Bahera	-	250	-	250	0.23
14.	Kadam	-	-	90	90	0.08
15.	Jamun	-	50	-	50	0.05
16.	Jamova	-	50	-	50	0.05
17.	Alistonia	-	50	-	50	0.05
18.	Suhanjana	-	50	-	50	0.05
19.	Imli	-	40	-	40	0.04
20.	Kachnar	-	10	-	10	0.01
Total		22000	3300	82500	107800	100.00

The analysis of the above table reveals that the percentage of Eucalyptus, Khair, Neem, Chir, Teak, Bakain, Arjun, Toon, Papri, Anwla, Jatropha planted under this scheme was 39.80%, 11.50%, 9.50%, 8.72%, 7.14%, 7.12%, 4.27%, 4.17%, 2.64%, 2.32% and 1.95% respectively during the year 2002-03 to 2004-05. The percentage of plantation of other species was found very low.

3.7 Type of Plants Raised

During the course of field survey information pertaining to type of species planted was collected. The information collected in this regard is analysed in the subsequent table:-

Table 3.5

Type of plants raised in the sampled sites during the year 2002-03 to 2004-05

Sr.No.	Name of species planted	No. of plants raised	Type of plants			
			Clone	Hybrid	Desi	Grafted
1	2	3	4	5	6	7
1.	Eucalyptus	42900	11000	-	31900	-
2.	Khair	12400	-	-	12400	-
3.	Neem	10250	-	-	10250	-
4.	Chir	9400	-	-	9400	-
5.	Teak	7700	-	-	7700	-
6.	Bakain	7680	-	-	7680	-
7.	Arjun	4600	-	-	4600	-
8.	Toon	4500	-	-	4500	-
9.	Papri	2850	-	-	2850	-
10.	Anwla	2500	-	-	2500	-
11.	Jatropha	2100	-	-	2100	-
12.	Shisham	330	-	-	330	-
13.	Bahera	250	-	-	250	-
14.	Kadam	90	-	-	90	-
15.	Jamun	50	-	-	50	-
16.	Jamova	50	-	-	50	-
17.	Alistonia	50	-	-	50	-
18.	Suhanjana	50	-	-	50	-
19.	Imli	40	-	-	40	-
20.	Kachnar	10	-	-	10	-
Total		107800	11000 (10.20%)		96800 (89.80%)	-

(Figures in brackets are percentages to total)

The data represented in the above table reveals that as many as 107800 plants were raised in the sampled sites of various species under the scheme during the year 2002-03 to 2004-05. As far as the type of species of plants is concerned as many as 11000 (10.20%) seedlings of clone type of eucalyptus were planted and remaining 96800 (89.80%) seedlings were of desi type.

3.8 Survival Rate

With a view to ascertain survival rate of plantation, the observation of the surveyor in this regard is given in the following table:-

Table 3.6

Survival rate of plantation raised in forest divisions/ sampled sites during the year 2002-03 to 2004-05.

Sr. No.	Name of forest division	Name of sampled site	No. of plants raised	No. of plants found survived	Survival rate
1.	Ambala	1. Bharog	6600	4849	73.47
		2. Manakpur Herbal Park	1100	180	16.36
2.	Kaithal	3. Saraswati Drain	15720	14229	90.52
		4. Deban Nagura Road	2200	1892	86.00
		5. Mahmoodpur Khabera Road	4400	3564	81.00
3.	Panchkula	6. Thandog Reserve Forest	11500	9665	84.04
		7. Bir Shikargarh Mallah Reserve Forest	8800	6288	71.45
		8. Mirpur Reserve Forest	3600	4485	71.19
		Total	56620	45152	79.75

It is observed from the above table that the survival rate varied from site to site. The survival rate of site of Saraswati Drain was highest i.e. 90.52% and lowest 16.36% of Manakpur Herbal Park. The survival rate of other 6 sites was between 71.19% to 86.00% .

3.9 Species-wise Survival Rate (Sampled Sites)

1. Division Ambala

For the success of any plantation programme survival rate of trees (SRT) is an important component of the scheme. During the course of field survey

survival rate of species of plant planted in the sampled sites was observed and the result worked out on this aspect is shown in the following tables:-

Table 3.7
Species-wise survival of plants raised in
forest division Ambala during 2002-03 to 2004-05

Name of forest division	Name of site	Species of plant	No. of plants checked	No. of plants found survived	Survival percentage
Ambala	1. Bharog	1. Eucalyptus	4400	3349	76.11
		2. Khair	2200	1500	68.18
	Total		6600	4849	73.47
	2. Manakpur Herbal Park	1. Jamun	50	10	20.00
		2. Neem	250	100	40.00
		3. Bahara	250	50	20.00
		4. Anwla	150	Nil	0.00
		5. Arjun	200	Nil	0.00
		6. Imlı	40	Nil	0.00
		7. Jamova	50	10	20.00
		8. Alistonia	50	Nil	0.00
		9. Kachnar	10	Nil	0.00
		10. Suhanjans	50	10	20.00
	Total		1100	180	16.36
	Grand total		7700	5029	65.31

The information in the above table shows that the survival rate of species of Eucalyptus at Bharog site was 76.11% and in respect of Khair was 68.18%. The survival rate of species of plant raised at Manakpur Herbal Park site was 16.36%, which was not satisfactory. The survival rate of plants viz. Jamun, Neem, Bahera, Jamova & Suhanjans were observed 20.00%, 40.00%, 20.00%, 20.00% and 20.00% respectively. The reason of low survival rate was the plantation time i.e. October/ November, which was not proper time of plantation.

2. Division Kaithal:

Table 3.8

Species-wise survival of plants raised in forest division
Kaithal during 2002-03 to 2004-05

Name of forest division	Name of Site	Species of plants	No. of plants checked	No. of plants found survived	Survival percentage
Kaithal	1. Saraswati Drain	1. Eucalyptus	3300	3150	95.45
		2. Neem	3300	3135	95.00
		3. Arjun	2200	2000	90.91
		4. Kadam	90	70	77.78
		5. Shisham	330	200	60.61
		6. Bakain	2200	2014	91.54
		7. Papri	2200	1980	90.00
		8. Jatropa	2100	1680	80.00
	Total		15720	14229	90.52
	2. Deban Nagura Road	1. Eucalyptus	2200	1892	86.00
	3. Mahmoodpur Khabera Road	1. Eucalyptus	4400	3564	81.00
	Grand Total		22320	19685	88.19

The above table shows that the survival rate of the species planted in Kaithal forest division varied from site to site. The survival rate of Eucalyptus species was highest (95.45%) at Saraswati Drain site and lowest(60.61%) in respect of Shisham. The survival rate of Eucalyptus species at site namely Deban Nagura Road and Mahmoodpur Khabera Road was 86.00% and 81.00% respectively. The overall survival percentage of the sampled sites of Kaithal forest division was 88.19 which was satisfactory.

3. Division Panchkula

Table 3.9

Species wise survival of plants raised in forest division,
Panchkula during 2002-03 to 2004-05

Name of forest division	Name of site	Species of plants	No. of plants checked	No. of plants found survived	Survival percentage
Panchkula	1.Thandog Reserve Forest	1. Chir	4400	3815	86.70
		2. Toon	4500	3890	86.44
		3. Bakain	2600	1960	75.38
		Total		11500	9665
	2. Bir Shikargarh Mallah Reserve Forest	1. Khair	1100	790	71.82
		2. Teak	3300	2328	70.54
		3. Arjun	2200	1650	75.00
		4. Anwla	2200	1520	69.09
	Total		8800	6288	71.45
	3. Mirpur Reserve Forest	1. Khair	3300	2370	71.82
		2. Papri	650	470	72.31
		3. Teak	2200	1550	70.45
		4. Anwla	150	95	63.33
	Total		6300	4485	71.19
	Grand total		26600	20438	76.83

The data indicated in the above table reveals that the survival rate of plants raised at Thandog Reserve Forest in respect of species of Chir, Toon and Bakain plants was observed 86.70%, 86.44% and 75.38% respectively. At Bir Shikargarh Mallah Reserve Forest, the survival rate of plants namely Khair, Teak, Arjun and Anwla was observed 71.82%, 70.54%, 75.00% and 69.09% respectively. The survival rate of Anwla species was found below the standard survival rate, i.e. 70.00% as fixed by the department. The survival rate of plants viz Khair, Papri, Teak and Anwla was assessed 71.82%, 72.31%, 70.45% and 63.33% respectively at Mirpur Reserve Forest site. The survival rate of Anwla

species was also found below the standard survival rate i.e. 70% as fixed by the Forest Department.

3.10 Health of Species of Plant

The health of species of plant found survived during field survey of sampled sites is indicated in the following table: -

Table 3.10
Sampled site-wise health of plants during
2002-03 to 2004-05

Sr. No.	Name of sampled sites	Name of species of plant raised	No. of plant found survived	Health of plant in % to total survived plants		
				Good	Normal	Below
1.	Bharog	1. Euclyputs	3349	70	20	10
		2. Khair	1500	50	30	20
2.	Manakpur Herbal Park	1. Jamun	10	-	40	60
		2. Neem	100	-	50	50
		3. Bahera	50	-	10	90
		4. Jamova	10	-	-	100
		5. Suhanjans	10	-	-	100
3.	Saraswati Drain	1. Eucalyptus	3150	70	20	10
		2. Neem	3135	60	30	10
		3. Arjun	2000	50	30	20
		4. Kadam	70	40	40	20
		5. Shisham	200	50	30	20
		6. Bakain	2014	50	35	15
		7. Papri	1980	40	30	30
		8. Jatropa	1680	60	20	20
4.	Deban Nagura Road	1. Eucalyptus	1892	80	15	5
5.	Mahmoodpur Kbabera Road	1. Eucalyptus	3564	60	30	10
6.	Thandog Reserve Forest	1. Chir	3815	75	15	10
		2. Toon	3890	70	25	5
		3. Bakain	1960	75	15	10
7.	Bir Shikargarh Mallah Reserve Forest	1. Khair	790	50	40	10
		2. Teak	2328	60	30	10
		3. Arjun	1650	40	40	20
		4. Anwla	1520	40	45	15
8.	Mirpur Reserve Forest	1. Khair	2370	40	40	20
		2. Papri	470	40	30	30
		3. Teak	1550	50	30	20
		4. Anwla	95	30	40	30

The data presented in the table No. 3.12 is in the form of percentage reveals about the health status of plants which is one of the qualitative parameters. Health of the plants of sites namely Bharog, Saraswati Drain, Deban Nagura Road, Mahmoodpur Khabera Road and Thandog Reserve Forest was observed better than the health of plants of sites of Bir Shilkargarh Mallah Reserve Forest and Mirpur Reserve Forest.

The health of plants raised in Mankpur Herbal Park was observed not to the expectation of the norm of the department.

3.11 Monitoring Mechanism

Regular and effective monitoring by the expert of the Forest Department or high-ups is very essential and plays a key role in the smooth implementation of the scheme, keeping in view the aspect, DFO as well as RO were enquired about the monitoring of the sampled sites of plantation of the RDF Scheme.

During the course of survey, it was observed that no record was maintained by the office of Divisional Forest Officers of monitoring done by the DFO concerned to the plantation sites. However, the DFO told that they visit the site of plantation as and when they feel necessary. It was found after getting the copy of monitoring report from DFO Kaithal that only CF H.Q. visited the site 'Saraswati Drain' on 18/19 November, 2004. The DFO Monitoring having H.Q. at Karnal had not monitored any sampled sites.

3.12 Employment Generation

Information regarding employment generated under the scheme was obtained from the three-selected Divisional Forest Officers. Whole plantation work involves labour and mostly local people were also provided employment. The information collected on this aspect is analyzed in table given below: -

Table 3.11

Employment generated under Rehabilitation of Degraded Forests scheme by the selected DFOs during 2002-03 to 2004-05.

(Rs. in lakh)

Sr.No.	Name of DFO	Outlay	Expenditure on employment generation	No. of mandays generated	No. of local people employed
1.	Ambala	14.91	14.74	17113	857
2.	Kaithal	17.61	17.22	19350	911
3.	Panchkula	23.38	23.11	26621	1011
	Total	56.10	55.07	63084	2779

The data represented in the table shows that a sum of Rs. 55.07 lakh had been utilized on employment generation during the years 2002-03 to 2004-05. As many as 63084 mandays were generated during the aforesaid period. The highest no. of mandays i.e. 26621(42.20%) were generated in Panchkula forest division with a fund of Rs. 23.11 lakh which was Rs. 86.81 per manday. While 19350(30.67%) and 17113 mandays (27.13%) were generated in the Kaithal and Ambala forest divisions against Rs. 17.22 lakh and Rs. 14.74 lakh which was Rs. 88.99 and Rs. 86.13 per manday respectively. While overall wages per manday is Rs. 87.30. The further analysis of the information reveals that as many as 2779 local people were employed in the plantation activities in the three forest divisions during the years 2002-03 to 2004-05.

3.13 Observations regarding maintenance and protection measures adopted by the Forest Department under Rehabilitation of Degraded Forests scheme

An attempt has also been made to assess the measures adopted for maintenance/protection of plantation done under the RDF scheme during the year 2002-03 to 2004-05. The sample-wise observations as obtained during the course of survey are summarized as under:-

1. Bharog

The plantation on this site was done during the month of July & August 2002. The site was visited during the month of Oct. 2005, when the plantation was of 3 years and 2 months old. Watering operation was not proper. Weeding and hoeing operation were also not taken up in the plantation of eucalyptus as well as of khair as observed on date of survey. Sarkanda was found standing among the khair plants, hampering the proper growth of the Khair plants. Termite (white ant) attack was also found on some plants and no measures were taken up to control this attack.

2. Manakpur Herbal Park

The plants on this site were planted during the month of Oct.2002 and the plantation was of 3 years old. It was found that weeding and hoeing operations were not taken up and watering was also not done. White-ant attack was found on the plantation. No adequate arrangements were made to protect the plantation.

3. Saraswati Drain

The plantation on this site was done during the month of July, 2004. The plantation was of 16 months old. The watering was not done, weeding and hoeing operations were also not carried out. No adequate arrangement of maintenance and protection like fencing were taken up. Arjun plants were found affected by termite attack. Porcupine attack on neem plants was also observed.

4. Deban Nagura Road

The plantation on this site was done during the month of July 2003. The plantation was of 2 years and 4 months old. Illicit felling of some eucalyptus was observed. The growth of plantation found good. Weeding and hoeing operations as well watering was not found done on the site during the course of field survey.

5. Mahmoodpur Khabera Road

Plants were planted on this site during the month of July 2004. The plantation was as old as 16 months. Watering was found done. Weeding/ hoeing operations were found done. Termite (white ant) attack was observed on some eucalyptus plants and no measures were taken up to control this type of attack. Protection measures like barbed wire were not adopted.

6. Thandog Reserve Forest

The species of plant i.e. Chir. Toon and Bakain were planted on this site during the month of July and August 2004. The plantation was found as old as 16 months. Weeding and hoeing operations were done. Watering depends mainly on rain. Grazing of plants by wild animals i.e. Kakkhar and Langoor was observed. Protection measures such as barbed wire were not taken up.

7. Bir Shikargarh Mallah Reserve Forest

Seedlings namely, Khair, Teak, Arjun and Anwla were planted on this site during the month of July and August 2004. The plantation was found as old as 15 months. Weeding operations were found proper. No watering was observed. Adequate maintenance/protection measures such as protection from frost and cold was not done. Weeds growth viz. lantana and shrubs were observed and these weeds were hampering the growth of plants.

8. Mirpur Reserve Forest

The plantation of species of plants like Khair, Papri, Teak and Anwla was found done on this site during the month of July 2004. Weeding was found done and watering to plantation was not done. Protection measure like chhapa binding to save the plants from frost and grazing of plants from the wild animals were not taken up.

3.14 Display of Signboard

In order to know whereabouts relating to the work/ activity carried out by the Forest Department it is necessary that a signboard should be prepared and

displayed at the site so that the visiting officer can easily differentiate the plantation work done at particular site.

During the course of field survey of Kaithal Forest Division of Mahmoodpur Khabera Road it was observed that the plantation work of two schemes namely Strip Plantation and Plantation of Rehabilitation of Degraded Forests Scheme was taken up on the same site. The plantation work under Strip Plantation was done in between the birm and ridge place raising the seedling of shisham, neem and arjun respectively whereas the plantation under the RDF scheme was done on ridges. So during the course of field survey it was difficult to differentiate the plantation done under which scheme i.e. strip plantation/RDF. It was found that on all the 8 sampled sites where the plantation done have been under the RDF scheme there was no signboard displayed.

3.15 Views of Divisional Forest Officers

1. The clonal type of plants should be raised to achieve good survival as well as to achieve success of the implementation of RDF scheme.
2. Cost norms must be increased.
3. Local community must be involved in the planning of the forestry scheme.
4. Soil and moisture conservation measures should also be taken in view for the plantation activities.
5. Sufficient funds for maintenance should be provided by the department.

3.16 General Observation of Surveyors

1. Proper plantation time/period was not adhered to while raising plants on the site of Manakpur Herbal Park. Hence survival of plants was found at a very low level.
2. Inadequate control for termite (white ant) and spray of insecticides/ pesticides to prevent disease affected plantation observed.
3. Monitoring of the scheme was not done at the desired level.

4. Species of plants being prepared in departmental nurseries from desi/local seeds were found planted on the all 8 sampled sites.
5. Lack of adequate protection and maintenance arrangement to save the plantation.
6. Lack of weeding and hoeing operations observed.
7. Watering of Plants not done except at one site.
8. Health of species of plants viz. Jamun, Bahera, Jamova, Suhanjana, Kadam, Papri, Anwla was observed poor.

3.17 Views of Knowledgeable Persons:

In order to know the extent of involvement of local people, views of 16 knowledgeable persons were obtained during the field survey, all were from rural area.

Out of these knowledgeable persons, 4 were matriculate, 5 middle, 4 primary and 3 illiterate. The knowledgeable persons contacted were Numberdar, Sarpanch/Ex sarpanch, Panch and Agriculturist. The view expressed by them about the implementation of the scheme are summarized as below:-

1. All the 16 knowledgeable persons were aware about the plantation of the 8 sampled sites. But they were not aware of the name of scheme under which plantation work was done.
2. As many as 3 knowledgeable persons were not satisfied with the work of plantation done under this scheme.
3. All the 16 knowledgeable persons were not aware of the watering done on the sites.
4. As many as 11 (68.75%) knowledgeable persons were aware of the employment provided to the local people.
5. All the 16 knowledgeable persons opined that regular watchman should be deployed to watch the plants and to save them from the wild animals.

Chapter IV

Summary of Findings, Shortcomings and Recommendations

Rehabilitation of Degraded Forests scheme is State Plan scheme. Under this scheme the forest department is involved in plantations on government forest land and also on village panchayat and community land. This scheme was launched by the forest department during the year 1988-89. Under this scheme seedlings of different species prepared in the departmental nurseries are raised on the government forest land and panchayat land. This component ensures the total involvement of the functionaries of the forest department.

The primary object of this scheme is to provide the local people with fuel wood, fodder, small timber and other minor forest produce. Conserving soil and moisture in situ, generating employment and reforesting the degraded hills are the main objectives of this component.

A decision was taken in the meeting held on 11.10.2004 under the chairmanship of the Financial Commissioner and Principal Secretary to Govt. Haryana, Planning department that an evaluation study be carried out to ascertain the impact of the Rehabilitation of Degraded Forests Scheme in its implementation and to suggest necessary corrective measures to be adopted for implementation so as to get intended benefits of the scheme. The study is based on the primary as well as secondary data.

Three forest divisions out of 10 divisions were selected keeping in view the maximum area coverage during the year 2002-03 to 2004-05 and 8 sites of the three forest divisions namely Ambala, Kaithal and Panchkula were selected by adopting random sampling technique for carrying out the survey.

The main findings of the study are as under: -

1. The percent coverage of sampled sites (total 8 sites) was 8.99 of the total sites.

2. An area of plantation of the all 8 sampled sites covered was 98 hect under the scheme.
3. Plantation time period in Manakpur herbal park was not adhered to.
4. The eucalyptus plants were raised on ridges while other species were planted in pits.
5. A total of 107800 plants of different species were planted in the sampled sites out of which 42900 (39.80%) plants of eucalyptus were planted. 56620 plants were checked which is 52.52% of the total.
6. Out of the total 42900 eucalyptus plants, as many as 11000 (25.64%) clone type of plants were planted.
7. The survival rate of the plantation of 8 sampled sites was assessed 79.75% during the year 2002-03 to 2004-05.
8. The survival rate of Bharog of Ambala division was observed 76.11% of eucalyptus and 68.18% of khair plants.
9. The survival rate of plants raised in Manakpur herbal park was observed 16.36%, which was lowest among all the plantation sites.
10. The survival rate of plants of Sarswati drain was assessed 60.61% and 90.52% and Deban nagura road and Mahmoodpur khabra road was assessed 86.00% and 81.00% respectively.
11. The survival rate of plants raised in Thandog reserve forest was observed between 75.38% to 86.70%.
12. The survival rate of plants of Bir Shikargarh mallah reserve forest site was observed between 69.09% to 75.00%.
13. The survival rate of plants of Mirpur reserve forest site was observed between 63.33% to 72.31%.
14. The survival rate of anwla of Bir Shikargarh mallah reserve forest as well as Mirpur reserve forest was found 69.09% and 63.33% respectively, which is the lowest survival rate as fixed by the forest department.

15. The health of plants of sites namely, Bharog, Sarswati drain, Deban nagura road, Mahmoodpur khabera road and Thandog reserve forest was found good.
16. The Health of plants of sites namely manakpur herbal park, Bir Shikargarh mallah reserve forest and Mirpur reserve forest was found not good.
17. As per record made available in respect of monitoring mechanism the monitoring of only one site of Sarswati drain was done by the Conservator of Forest head quarter.
18. All the 8 sampled sites were monitored by the DFO but record in this respect was not made available which can ensure the visits of DFO to the respective sites.
19. Adequate and timely maintenance arrangements were not done in all the 8 sampled sites.
20. A sum of Rs. 55.07 lakh out of Rs. 56.10 lakh was utilized on employment generation under the RDF scheme.
21. A total number of 63084 mandays were generated under the RDF scheme during the year 2002-03 to 2004-05.
22. As many as 2779 local people provided employment under the RDF scheme during the years 2002-03 to 2004-05.
23. Sign boards with particulars of plantation were not found displayed on all the sampled sites.
24. Divisional .forest officers opined that the clonal type of plants should be raised to achieve good survival of plants.
25. Lack of wide publicity about the scheme was observed.

26. Village forest committees were not constituted for the implementation of the RDF scheme.
27. Lack of regular watch on the plantation sampled sites was observed.

Shortcomings /bottlenecks

The study has highlighted certain shortcomings/bottlenecks as per observations made by the surveyors in smooth execution of the scheme which include (i) non adherence of time period of plantation in Manakpur herbal park (ii) low survival rate of plantation of site of Manakpur herbal park. (iii) inadequate maintenance and protection measures to protect the plantation (iv) lack of effective control from termite (white ant) attack and lack of spray of insecticides/pesticides for the prevention of disease affected plants (v) lack of desired level of monitoring at all levels (vi) lack of wide publicity of the scheme (vii) lack of involvement of local elected persons of Panchyati Raj Institutions (viii) lack of regular watch of the plantation site. (ix) non maintenance of record relating to monitoring at RO and DFO level. (x) no identification of areas for research and development.

Recommendations

On the basis of various findings and observations the following recommendations have been proposed for qualitative improvement in the implementation of the scheme.

1. Appropriate soil and water conservation measures like contour bunds, gully plugs and check dams in the plantation area are essential for soil and moisture conservation in Shivalik and Aravali areas.
2. The Forest Department should ensure completion of pre plantation activities before the rainy season and proper plantation time period (rainy season) should be strictly adhered to.

3. Selection of species of plants should be done keeping in view the type of soil, topography of soil, climatic condition and biotic factors. In this regard research and experimental activities should be done well in advance before implementation of the scheme.
4. Only well developed plants with a long and spreading root system should be planted, so that they may establish quickly and may send down roots to deeper layers of soil for moisture.
5. The plantations are mostly carried out in non-agricultural land, waste land, panchayat land, degraded land etc. These lands are low in fertility, poor in nutrient status and low soil moisture retention capacity. Therefore, provision of irrigation at the initial stage is important for survival of plants. Suitable mode of irrigation i.e. hand watering, sprinkler or drip should be made available on each plantation site.
6. It is desirable that weed growth in plantation should be kept under control through mechanical cutting and uprooting or by spraying of suitable weedicides.
7. Adequate and sufficient funds for maintenance should be provided to the DFOs.
8. Adequate and timely maintenance measures such as watering, weeding and hoeing, protection from frost and termite attack etc. should be taken as per norm fixed by the department.
9. Norm for monitoring should be fixed. Monitoring at each level be ensured and record of the same should be maintained at DFO level and follow up actions should also be taken up.
10. Lantana a foreign weed found in abundance should be controlled for the proper growth of plantation.

11. Signboards with particulars viz. name of site, year of plantation, name of scheme, name of species of plants and area covered under plantation should be prepared and displayed at every site of plantation.
12. Regular watch should be ensured for the protection of the plantation.
13. Village forest committee should be constituted for the involvement of the local people.

Annexure-I

Area of Plantation covered under RDF Scheme

(Area in hect.)

Year	Area covered
1988-89	520
1989-90	870
1990-91	2119
1991-92	-
1992-93	185
1993-94	191
1994-95	40
1995-96	100
1996-97	-
1997-98	-
1998-99	-
1999-2000	-
2000-01	-
2001-02	-
2002-03	198
2003-04	256
2004-05	236

Annexure-II

DFO wise target and achievement under RDF scheme
during 2002-03 to 2004-05

(Area in hect.)

Sr. No.	Name of district	Target			Total achievement	% to Total
		2002-03	2003-04	2004-05		
1	2	3	4	5	6	7
1.	Ambala	50	40	0	90	13.04
2.	Faridabad	38	0	0	38	5.51
3	Jind	30	0	0	30	4.35
4.	Karnal	25	20	0	45	6.52
5.	Kaithal	0	30	90	120	17.39
6.	Kurukshetra	30	20	0	50	7.25
7.	Panchkula	0	86	73	159	23.04
8.	Sirsa	0	0	58	58	8.41
9.	Sonipat	25	0	0	25	3.62
10	Yamunanagar	0	60	15	75	10.87
	Total	198	256	236	690	100.00
