

Report

**MONITORING & EVALUATION OF CAMPA WORKS
CARRIED OUT DURING 2011-12 & 2012-13 BY
DEPARTMENT OF FORESTS & WILDLIFE, GOVT. OF
NCT OF DELHI
Under Delhi CAMPA**



Submitted to

**Chief Conservator of Forest
Delhi Forest Department
New Delhi**



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Executive Summary

Asola Bhatti Wildlife Sanctuary, with a geographical area of 2782 ha, is located in South Delhi district of Delhi State of India. Though, the community land of villages Asola, Shapur & Maidangari (4707 Acre) was notified during 1986 & land of Bhatti (2167 Acre) was notified in 1991 for this Wildlife Sanctuary but the encroachments and illegal mining could not be controlled.

132 INF BN (TA) ECO-RAJPUT was raised as a Eco-Task Force (ETF) in the year 2000 for controlling the encroachments and illegal mining and eco-restoration of Asola Bhatti Wildlife Sanctuary.

For eco-restoration, two schemes (State scheme and CAMPA scheme) are being implemented by the ETF in the Asola Bhatti Wildlife Sanctuary. The State scheme is being implemented w.e.f 2001-02 and the CAMPA scheme w.e.f 2011-12. The Delhi Forest Department is providing funds and technical assistance to the ETF for the implementation of these schemes.

Ministry of Environment and Forests (MoEF), Govt. of India had issued guidelines on 2nd July 2009 for establishing Compensatory Afforestation Fund Management and Planning Authority (CAMPA) in the States/UTs and putting in place a funding mechanism for enhancing forest and tree cover and conservation and management of wildlife by utilising funds received towards Compensatory Afforestation (CA), Net Present Value (NPV), etc., currently available with the Adhoc CAMPA. Accordingly, the CAMPA was established in the Delhi State.

In CAMPA scheme, the ETF has planted 254,592 plants of 59 species of fruit, shady, ornamental, timber and medicinal value during 2011-12 and 2012-13 against the target of 200,000 plants fixed by the Delhi Forest Department resulting in 127% achievement. Further, ETF has achieved 100% target of soil and moisture conservation (SMC) works fixed by the Forest Department.

Third Party Evaluation of CAMPA works of the year 2011-12 and 2012-13 was done by the AFC India Limited, New Delhi, during January and February 2015. For this, 100% counting of pits dug up for planting and the surviving plants in the pits were done and general observations of height and growth of plantations were taken. Technical aspects of SMC works were evaluated and general observations of encroachments and illegal mining were made.

The results of evaluation were as given below:

- 1. The ETF has achieved the main objective of controlling the illegal mining and encroachment as no fresh mining/encroachment was observed in the Asola Bhatti Wildlife Sanctuary.*
- 2. The achievement of plantation was 125% against the target of 200,000 plants fixed by the Forest Department.*

The survival of plantation was very good (89.71%).

Though, 59 species of fruit, shady, ornamental, timber and medicinal value were planted but the maximum growth was of Shisham (Dalbergia sissoo), Bamboo

(Bamboo species), Pahari Papri (Holoptelia integrefolia), Neem (Azadirachta indica) and Kikar (Acacia nilotica).

Irrigation system installed has helped a lot in the survival and growth of plantations.

3. *The achievement of SMC works was 100% against the target fixed by the Forest Department.*

Though, the SMC works were serving their purpose up to some extent but these works need technical improvements. .

For further improvement in Asola Bhatti Wildlife Sanctuary, it is recommended that:

- i. *Presence of Eco-Task Force in the Asola Bhatti Wildlife Sanctuary should be continued.*
- ii. *Map of Asola Bhatti Wildlife Sanctuary showing all the roads, paths, ETF office and posts, Forest office, lake, monkey feeding points, etc. and the habitations on its boundary along with geo-references should be prepared.*
Year wise locations of all the sites of works carried out should be marked on the map.
This map should be updated every year.
Geo-reference of all the sites of works should be mentioned in the annual reports.
- iii. *Irrigation system should be extended in all the young plantations.*
- iv. *Services must be taken of an expert in soil and moisture conservation works.*
- v. *Tree groves of Neem (Azadirachta indica), Bar (Ficus benegalensis), Pipal (Ficus religiosa) and Gular (Ficus racemosa) should be raised on mounds encircled with deep trench.*

ABBREVIATIONS

APO	Annual Plan of Operations
CA	Compensatory Afforestation
CAMPA	Compensatory Afforestation Fund Management & Planning Authority
DCF	Deputy Conservator of Forests
ETF	Ecological/Eco Task Force
FCA	Forest (Conservation) Act
JJ	<i>Jhugi-Jhopdi</i>
GNCTD	Government of National Territory of Delhi
MoEF	Ministry of Environment & Forests
NPV	Net Present Value
PCA	Penal Compensatory Afforestation
SMC	Soil & Moisture Conservation
TA	Territorial Army
UT	Union Territory
WLS	Wildlife Sanctuary

INTRODUCTION

Ministry of Environment and Forests (MoEF), Govt. of India had issued guidelines on 2nd July 2009 for establishing Compensatory Afforestation Fund Management and Planning Authority (CAMPA) in the States/UTs and putting in place a funding mechanism for enhancing forest and tree cover; conservation and management of wildlife by utilising funds deposited in the form of Net Present Value and Compensatory Afforestation/Penal CA on account of diversion of forest land for non-forestry purposes under FCA 1980 and to utilize the money in phased manner to carry out CA and other forestry works. The money is being released to State/UT Governments yearly for raising Compensatory Afforestation and other forestry related works under CAMPA. CAMPA - Delhi was established in the Delhi State vide notification No. F.1/CF/FCA/07-08/Part-II/ 3517-3540 dated 05.10.2009.

It is mandatory for States to carry out monitoring of CAMPA works by third party. Therefore, the work of monitoring and evaluation was awarded by Forest & Wildlife Department, Government of National Territory of Delhi (GNCTD) to Agriculture Finance Corporation for the works carried out under CAMPA during the year 2011-12 and the year 2012-13 (Annexure-A) assigning following scope of work:

1.1 Scope of Work:

Initially AFCIL proposed to take twenty percent sample area of year 2011-12 & 2012-13 for the detailed M&E task. But at the time of issuing work order the Chief Conservator of Forests has directed to the AFCIL to cover hundred per cent plantation area of both the years instead of twenty percent sampling. Accordingly the AFCIL has been covered the entire plantation areas and assess the survival percentage through counting of each plants planted during 2011-12 & 2012-13 under CAMPA.

Under the M&E the focus was mainly on assessing the survival of plants planted in two different years. Besides quantitative assessment of the plantation the key personal of study team were interacted with the field functionaries through Participatory Approach and shared the technical lacuna immediately whenever come across during the enumeration of plants.

1.2 Background:

An area of 42.0225 ha of forest/deemed forest land has been diverted for non-forestry purposes under FCA for various developmental works in the State of Delhi till the Year 2012-13. The total Compensatory Afforestation/Penal CA to be carried out was 87.84 ha. Total amount realized against cost of Compensatory Afforestation, Penal Compensatory Afforestation and Net Present Value is **Rs. 3467.978 lakhs (Annexure-I)** and deposited under Adhoc CAMPA. As per CAMPA guidelines, Compensatory Afforestation had to be carried out on double the forest area diverted. The total CA/PCA to be carried out was 87.84 ha but the Department has carried out plantation of over 200 ha on degraded forest land in Asola Wildlife Sanctuary against 87.84 ha. First Annual Action Plan under CAMPA –Delhi was approved in the year 2011-12. Proposal for carrying out Compensatory Afforestation over 100 ha of degraded forest land in Asola Wildlife Sanctuary was approved under first Action Plan during the year 2011-12. Compensatory Afforestation over 100 ha has been carried out in Asola Wildlife Sanctuary as per approved Action Plan under CAMPA during the year 2011-12. Since, there was availability of degraded forest land in Asola Wildlife Sanctuary and enough funds were available under Delhi CAMPA, therefore, it was proposed to carry out afforestation on additional 100 ha in Asola Wildlife Sanctuary to increase the forest cover in the State and also to enhance facilities for wildlife by carrying out enrichment plantation and soil moisture conservation works. The proposal for carrying out afforestation on additional 100 ha under CAMPA was approved during the Annual Action Plan of the year 2012-13 along with other allied works. An area of 200 ha has been afforested against the target of 87.84 ha under Delhi-CAMPA along with allied works related to soil conservation and wildlife management.

1.3 Site Selection for CA:

Earlier, it was proposed to carry out CA on degraded forest land in Ayanagar in South Forest Division but later it was decided to carry out CA in Asola WLS considering the availability of degraded forest area as well as to create suitable habitat for wild animals in Delhi.

1.4 Institutional Mechanism for Implementation of CAMPA

It was observed in the Executive Meeting that there was acute shortage of trained forestry personnel and infrastructure in the Department of Forests & Wildlife, GNCTD. The project of

eco-restoration of Bhatti Mines was being implemented well by Eco Task force since October 2000 which is adjacent to Asola WLS, having similar edapho-climatic conditions and vegetation, extremely vulnerable to biotic interference because of its proximity to human habitations like Sanjay Nagar Slum & *Jhugi Jhopadi*. Therefore, it was proposed and decided to implement CAMPA jointly through ETF and DCF (South).

1.5 Asola Bhatti Wildlife Sanctuary

Southern Ridge had been put to various landuse practices from times immemorial like mining, grazing and illicit felling of trees. The active mining of quartzite, commonly known as 'Badarpur' had heavily seared and severely degraded the Southern ridge. The area also used to act as cattle/goat grazing site by local villagers, severely affecting the vegetation of the region. To safeguard the potential biological values and ecological functions by providing sufficient protection, and to put a check on any further degradation of the impoverished land, the mining activity was stopped and Asola and Bhatti areas were notified as Wildlife Sanctuary.

In order to preserve the sanctity of the area, 2679.26 acres of land was carved out from the community land of three villages viz. Asola, Sahurpur and Maidan Garhi and notified as Asola Wildlife Sanctuary under Wildlife (Protection) Act 1972 vide notification No. F.3(116)/CWLW/84/897-906 Dated 09.10.1986. After imposing of ban on the mining of Badarpur by Hon'ble Supreme Court, and in the larger interest of protection of ecology of the area, 2166.28 acres of village Bhatti was notified as sanctuary vide notification No. F.2(19)/DCF/90-91/1382-91 dated 15.04.1991 as Asola Bhatti Wildlife Sanctuary (4845.57 acres).



Location map of Asola Bhatti Wildlife Sanctuary

The Asola Bhatti Wildlife Sanctuary is located on the Southern Ridge of Delhi in South Forest Division of GNCTD. This Ridge is the northern terminal part of Aravalli Hills, one of the oldest Mountain Systems of the world. The epic remains of natural Dhok (*Anogeissus pendula*) Forests of Aravalli Hills are some of the attractions of this sanctuary.



Epic Remains of natural Dhok Forests

1.6 History of establishment of ETF

Though, the community land of villages Asola, Shapur & Maidangari was notified during 1986 and the land of Bhatti village was notified in 1991 as Wildlife Sanctuary but the encroachments and illegal mining could not be controlled. The mining was for the stone and red and golden Badarpur sand that are always in hot demand. The red Badarpur sand and stone are used for building and construction activities and the valuable golden sand found in deeper layers of mining pits is used for the manufacturing of glass.

To check the illegal mining and encroachment on the forest land in Bhatti area, a unit of TA viz. 132 INF BN ((TA) Eco-Rajput was established in the year 2000, commonly called as ETF.

This ETF in Delhi was raised in the year 2000 for achieving the following objectives in the Asola Bhatti Wildlife Sanctuary:

- i. To remove encroachments.
- ii. To stop illegal mining.
- iii. To restore the ecology of the area.

The project of eco-restoration of Bhatti Mines was being implemented well by Eco Task force since October 2000 which is adjacent to Asola WLS, having similar edapho-climatic conditions and vegetation, extremely vulnerable to biotic interference because of its proximity to human habitations like Sanjay Nagar Slum & JJ. Therefore, it was proposed and decided to implement CAMPA jointly through ETF and DCF (South).

There are a number of abandoned large-open-deep mining pits in the ground all over the sanctuary and some of the pits are turned into lakes.



Mining Pit converted into a deep Lake



Deep & Dry Mining Pit

Two schemes (State scheme and CAMPA scheme) are being implemented by the ETF in the Asola Bhatti Wildlife Sanctuary. The State scheme is being implemented mainly in Bhatti and Mandi area, whereas the CAMPA scheme in Asola area.

The State scheme is being implemented by the ETF w.e.f 2001-02 and the CAMPA scheme w.e.f 2011-12. ETF has taken assistance of South Forest Division for the implementation of CAMPA scheme in Asola Bhatti area.

The Delhi Forest Department is providing funds to the ETF for the implementation of these schemes.

An area of 42.80 ha of forest/deemed forest land was diverted for non-forestry purposes under various developmental works in the State of Delhi up to 31-3-2013. Total amount realized against the cost of CA, Penal CA and NPV was Rs.3467.97 lakh and it was deposited in the account of Adhoc CAMPA. Against 42.80 ha, the CA was to be carried out on 87.46 ha of degraded forest land.

First Annual Action Plan under CAMPA Delhi was approved in the year 2011-12 for carrying out CA on 100 ha of land by planting 100,000 plants in the Asola Bhatti Wildlife Sanctuary and this target was successfully achieved during the year 2011-12.

Since enough funds as well as degraded forest land were available, the Second Annual Action Plan under CAMPA Delhi was approved in the year 2012-13 for carrying out CA on another 100 ha of land by planting 100,000 plants in the Asola Bhatti Wildlife Sanctuary and this target was also successfully achieved during the year 2012-13.

Therefore, during the years 2011-12 and 2012-13, a target of 200 ha was achieved by planting 200,000 plants in the Asola Bhatti Wildlife Sanctuary against the target of 87.46 ha resulting in 229% achievement.

Presently, maintenance of plantations of the years 2011-12 and 2012-13 is in progress.

1.5 Third Party Monitoring and Evaluation (M&E)

The present third party M&E report pertains to the works carried out by the ETF in the Asola Bhatti Wildlife Sanctuary during the years 2011-12 and 2012-13 under the CAMPA scheme.

Quantitative Evaluation

2.1 CA

As per approved annual plan, the plantations were raised during the years 2011-12 and 2012-13 under CAMPA scheme in the Asola Bhatti Wildlife Sanctuary by the Eco-Task Force (ETF) under the supervision of Delhi Forest Department.

2.1.2 Achievement of Physical Targets

Since the area was tough with less soil depth and lack of soil moisture, it was planned to plant 30% extra plants in first year so that atleast one lakh saplings will survive finally. Annual closure reports (showing fixed and achieved physical targets) for the years 2011-12 and 2012-13 of CAMPA scheme were obtained from the Eco-Task Force (ETF) and analyzed and the results of analysis were as given in table- 2.1.

Table- 2.1: Physical targets of plantation

Year	Target	Achievement
2011-12	100000 saplings	137600 saplings
2012-13	100000 saplings	116992 saplings
Total	200000 saplings	254592 saplings

Against the above said target the year wise and pocket wise numbers of plants planted are given below.

2.1.3 Achievement of Physical Targets

The number of plants planted in different pockets during year 2011-12 and 2012-13 are as given in Table- 2.2.

Table- 2.2: Achievement of targets of plantation achieved

Sr. No.	Year	Pocket	No. of Plants Planted
1	2011-12	A	15,871
		B	25,499
		C	27,106
		D	16,819
		E	11,726
		F	18,438
		G	22,141
		Sub-total	137,600
2	2012-13	A	37,165
		B	43,596
		C	13,165
		D	23,066
		Sub-total	116,992
Total			254,592

It is evident from Table-2.2 that:

- i. 137,600 plants were planted during 2011-12 against the total fixed target of 100,000 plants resulting in a higher achievement of 37600 plants.
- ii. 116,992 plants were planted during 2012-13 against the total fixed target of 100,000 plants resulting in a higher achievement of 16,992 plants.
- iii. Thus, 254,592 plants were planted during 2011-12 and 2012-13 against the total fixed target of 200,000 plants resulting in a higher achievement of 54592 plants.
- iv. Further, 254,592 plants were planted during 2011-12 and 2012-13 against the target of 200,000 plants fixed by the Forest Department resulting in 127% achievement.

2.1.4 Species Planted

The details of the species planted in each pocket during the year 2011-12 is given in Table-2.3.

Table- 2.3: Pocket wise species planted during 2011-12

Sr. No.	Name of Species		Pocket wise number of plants planted							
	Local/ English	Botanical	A	B	C	D	E	F	G	Total
1	Ailanthus/ Maha Neem	<i>Ailanthus excelsa</i>				200			532	732
2	Akash Neem	<i>Millingtonia hortensis</i>							35	35
3	Alstonia	<i>Alstonia scholaris</i>		8					8	16
4	Amaltas	<i>Cassia fistula</i>	165	165	833	260	70	913	160	2566
5	Amla	<i>Emblica officinalis</i>	165	320	195	130	8	50	125	993
6	Amrood	<i>Psidium guava</i>	15	30		4				49
7	Arjun	<i>Terminalia arjuna</i>	90	385		207	17		15	714
8	Bahera	<i>Terminalia bellerica</i>	300							300
9	Bakain	<i>Melia azadirachta</i>	100	130		110	9	12	22	383
10	Bans	<i>Bamboo species</i>	10	3007		200	250	1200	2450	7117
11	Bargad/Bar / Bari (Desi)	<i>Ficus benegalensis</i>	90	471	8	12	4	8	10	603
12	Bel Pattar	<i>Aegle marmelos</i>	50	90					70	210
13	Beri	<i>Zizyphus mauritiana</i>			880	583	1000	1010	292	3765
14	Boganvillea	<i>Boganvillea</i>	40							40
15	Bottel Brush	<i>Callistemon viminalis</i>							10	10
16	Cassia siamea	<i>Cassia siamea</i>	805			88		38	60	991
17	Dhak	<i>Butea monosperma</i>						15		15
18	Gullar	<i>Ficus racemosa</i>	200	55			2	5		262
19	Gulmohar	<i>Delonix regia</i>		40						40
20	Imli	<i>Tamarindus indica</i>	50	140		450			140	780
21	Jamun	<i>Syzygium cumini</i>	150	130		3	38		45	366
22	Jand/	<i>Prosopis cineraria</i>	90	520	180	1220	245	1430		3685

Sr. No.	Name of Species		Pocket wise number of plants planted							
	Local/English	Botanical	A	B	C	D	E	F	G	Total
	Khezari									
23	Jangle jalebi	<i>Phithocelbium duice</i>	760	635	430	400	24	125		2374
24	Kachnar	<i>Bahunia variegata</i>		10		213				223
25	Karonda	<i>Carissa karonda</i>						10		10
26	<i>Kigelia</i>	<i>Kigelia pinnata</i>	30	3						33
27	Khair	<i>Acacia catechu</i>		30				2		32
28	Khairi	<i>Acacia senegal</i>	24	975	3100	228	350	1780	200	6657
29	Kikar	<i>Acacia nilotica</i>	3840	6515	5515	4150	4960	6875	4181	36036
30	Lagerstroe mia	<i>Lagerstroemia speciosa</i>				10				10
31	Lasura	<i>Cordia dichotoma</i>	17	3		5		10	42	77
32	Mahogany	<i>Swietenia mahagoni</i>	7							7
33	Maror phalli	<i>Bigoniaspecies</i>	70							70
34	Neem	<i>Azadirachta indica</i>	20	425	60	100	6	8	35	654
35	Papri	<i>Pongamia pinnata</i>	500	200		1231	11		55	1997
36	Pahari Papri	<i>Holoptelia integrefolia</i>		2550	1340	450	35	926	3625	8926
37	Pilkhan	<i>Ficus infectoria</i>	10	52	15	10	3	12	16	118
38	Pipal	<i>Ficus religiosa</i>	25	21	7	12	5	9	10	89
39	Ronj	<i>Acacia leucophloea</i>	760	1085	11505	1750	1825	1720	2550	21195
40	Mulberry	<i>Morus alba</i>	8	217	10	5				240
41	Teak	<i>Tectona grandis</i>		4						4
42	Semal	<i>Bombax ceiba</i>	30	10						40
43	Shisham	<i>Dalbergia sissoo</i>	7150	6333	3020	4788	2864	2255	7270	33680
44	Siris	<i>Albizia lebbeck</i>	300	940	8			25	178	1451
45	Sohanjana	<i>Moringa oleifera</i>							5	5
Total			15871	25499	27106	16819	11726	18438	22141	137600

It is evident from table-2.3 that during 2011-12:

- i. Total 137,600 plants of 45 species of fruit, shady, ornamental, timber and medicinal value were planted.
- ii. Maximum numbers of plants planted were of Kikar (36036) followed by Shisham (33680) and Ronj (21195).

The details of species planted in each pocket during the year 2012-13 is given in Table-2.4.

Table- 2.4: Pocket wise species planted during 2012-13

Sr. No.	Name of Species		Pocket wise number of plants planted				
	Local/ English	Botanical	A	B	C	D	Total
1	Ailanthus/Maha Neem	<i>Ailanthus excelsa</i>		800	7		807
2	Akash Neem	<i>Millingtonia hortensis</i>			25		25
3	Alstonia	<i>Alstonia scholaris</i>		10	2		12
4	Am/ Mango	<i>Mangifera indica</i>		20	8		28
5	Amaltas	<i>Cassia fistula</i>	350	600	50	250	1250
6	Amla	<i>Emblica officinalis</i>	150	350	35		535
7	Anar	<i>Punica grantum</i>				2	2
8	Anjeer	<i>Ficus carica</i>		15			15
9	Arjun	<i>Terminalia arjuna</i>	200	150	65		415
10	Bahera	<i>Terminalia bellerica</i>		185	5		190
11	Bakain	<i>Melia azadirachta</i>		50	60	10	120
12	Bans	<i>Bamboo species</i>	2000	3000	100	2000	7100
13	Bar/Bargad//Bari (Desi)	<i>Ficus benghalensis</i>	5	20	5	7	37
14	Bel Pattar	<i>Aegle marmelos</i>		125	25		150
15	Beri	<i>Zizyphus mauritiana</i>	150	350	125	1678	2303
16	Bottel Brush	<i>Callistemon viminalis</i>		50	50		100
17	Cassia siamea	<i>Cassia siamea</i>		100	150		250
18	Dhak	<i>Butea monosperma</i>	20	70	10		100
19	Gullar	<i>Ficus racemosa</i>		170	248		418
20	Harad	<i>Terminalia chebula</i>		65			65
21	Imli	<i>Tamarindus indica</i>		110	170		280
22	Jakrinda	<i>Jacaranda mimosifolia</i>		5	2		7
23	Jamun	<i>Syzygium cumini</i>	10	760	256		1026
24	Jand /Khezari	<i>Prosopis cineraria</i>				300	300
25	Jangle jalebi	<i>Phithocelbium duice</i>	340	300	125		765
26	Kachnar	<i>Bahunia variegata</i>			65		65
27	Kadam	<i>Anthocephallus chenensis</i>		18	5		23
28	Katahal	<i>Artocarpus heterophyllus</i>			2		2
29	Kanak Champa	<i>Pterospermum acerifolium</i>		20	3		23
30	Khairi	<i>Acacia senegal</i>	6400	1000	40	2610	10050
31	Kikar	<i>Acacia nilotica</i>	13200	10720	3890	5010	32820
32	Khazoor	<i>Phoenix dactylifera</i>		10			10
33	Kusam	<i>Schleichera oleosa</i>		25			25
34	Lagerstroemia	<i>Lagerstroemia speciosa</i>		10	5		15
35	Lesua/ Lasura	<i>Cordia dichotoma</i>		25	38		63

Sr. No.	Name of Species		Pocket wise number of plants planted				
	Local/ English	Botanical	A	B	C	D	Total
36	Mahuwa	<i>Madhuca indica</i>		10	4		14
37	Millingtonia	<i>Millingtoniaspp</i>		15			15
38	Neem	<i>Azadirachta indica</i>	125	85	125	15	350
39	Papri /Karanj	<i>Pongamia pinnata</i>			15		15
40	Pahari Papri	<i>Holoptelia integrefolia</i>	1261	8600	3356	1125	14342
41	Pilkhan	<i>Ficus infectoria</i>	5	10	5		20
42	Pipal	<i>Ficus religiosa</i>	7	15	5	6	33
43	Ritha	<i>Sapindus mukorossi</i>		25	5		30
44	Ronj	<i>Acacia leucophloea</i>	11120	11050	5	6535	28710
45	Sahtoot/Toot/ Mulberry	<i>Morus alba</i>			256		256
46	Sagwan/ Teak	<i>Tectona grandis</i>		165			165
47	Semal	<i>Bombax ceiba</i>		20	9		29
48	Shisham	<i>Dalbergia sissoo</i>	1560	4200	3780	2520	12060
49	Siris	<i>Albizia lebbeck</i>	250	235	20		505
50	Sohanjana/ Drum sticks	<i>Moringa oleifera</i>		5			5
51	Subabul	<i>Leucaena leucocephala</i>				1000	1000
Total			37153	43568	13156	23068	116945

It is evident from Table-2.4 that during 2012-13:

- i. Total 116,945 plants of 51 species of fruit, shady, ornamental, timber and medicinal value were planted.
- ii. Maximum number of plants planted were of Kikar (32,820) followed by Ronj (28,710), Pahari Papri (14,342), Shisham (12,060) and Khairi (10,050).

Finally, it emerged from Table-2.3 and Table-2.4 that:

- i. Total 254,545 plants of 59 species of fruit, shady, ornamental, timber and medicinal value were planted during the years 2011-12 and 2012-13 under CAMPA scheme in the Asola Bhatti Wildlife Sanctuary.**
- ii. Maximum number of plants planted were of Kikar (68,856) followed by Ronj (49,905), Shisham (45,740), Pahari Papri (23,268) and Khairi (16,707).**

2.2 Soil and Moisture Conservation Works

2.2.1 Achievement of Physical Targets

Annual closure reports (showing fixed and achieved physical targets) for the years 2011-12 and 2012-13 of CAMPA scheme were obtained from the Eco-Task Force (ETF) and analyzed and the results of analysis were as given in Table- 2.5.

Table- 2.5: Soil and Moisture Conservation Works

Sr. No.	Name of work	Unit	Target	Achievement
Year 2011-12				
	Construction of Water Bodies	No.	0	3
	Improvement in the existing Water Bodies	No.	2	4
	Construction of Check Dams	No.	3	3
Year 2012-13				
	Trenching	RM	0	6623
	Construction of small <i>Kuccha</i> Water Bodies in mining pits	No.	0	4
	Construction of Check Dams	No.	0	2

It is evident from above Table- 2.5 that:

- i. The targets of soil and moisture conservation works have been achieved by 100%.
- ii. Target of 6623 rm trench, 4 *Kuccha* Water Bodies and 2 Check Dams have been achieved over and above the fixed target.

Qualitative Evaluation

3.1 CA

In Asola Bhatti Wildlife Sanctuary, plantations were raised during the years 2011-12 and 2012-13 under CAMPA Scheme by the Eco-Task Force (ETF) under the technical supervision of Delhi Forest Department.

The plantations were raised in 7 Pockets (A to G) during 2011-12 and in 4 Pockets (A to D) during 2012-13.

Evaluation of plantations was done during January and February 2015 and the results of evaluation were as given below:

3.1.1 Earth Work

Earth work was carried out with JCB machine at a spacing of 3m x 3m. Though, the earth work was very good but the alignment of pits was not proper since it was a gap plantation in WLS.

3.1.2 No. of Pits dug up

The counting of pit was carried out 100% of dug up pits in all the pockets and 249,665 pits were found on the spot against 254,545 pits reported resulting in a shortfall of 4,888 pits. This minor difference of 1.9% pits might be due to human error in counting of pits in the forest area.

The dug up pits (249,665) found on the spot resulted in:

- i. Achievement of 125% against the target of 200,000 pits fixed by the Forest Department under CAMPA.

Year wise and pocket wise details of dug up pits reported and found on the spot were as given in Table-3.1



Counting of pits and surviving plants in 2012-13 plantation of 13000 wali Pocket

3.1.3 No. of Surviving Plants

The counting of surviving plants was done in all the pockets to the extent of 100% and 223,974 plants were found on the spot in the 249,665 dug up pits resulting in 89.71% survival, which was very good. Although the target of plantation was 200000 saplings under CAMPA and at site the saplings found were 223974. Therefore, the survival of saplings can be said more 100%.

The plants planted in the trenches dug up under soil and moisture conservation were not counted for evaluation.

Similarly, the surviving plants of seed sowing of different tree species on the dug up soil of pits were not counted for the purpose of evaluation.

Year wise and pocket wise details of number of surviving plants in the dug up pits were as given in Table-3.1

Table-3.1: Year wise and pocket wise details of plantations

Sr. No.	Pocket	Number of Pits		Number of Surviving Plants	Survival %	Av. Height (m)
		Reported	On the spot			
Year 2011-12						
1	A	15,871	17,216	16,078	93.39	1.75
2	B	25,499	26,821	25,256	94.17	2.00
3	C	27,106	23,956	21,141	88.25	1.20

4	D	16,819	17,111	16,027	93.66	1.50
5	E	11,726	11,264	10,216	90.70	1.00
6	F	18,438	17,402	15,268	87.74	0.70
7	G	22,141	21,614	20,028	92.66	1.00
Sub-total		137,600	135,384	124,014	91.60	-
Year 2012-13						
1	A (Khajur wala & Kabul wali Post)	37,165	38,552	33,130	85.94	1.00
2	B (Khajur wala, Neem wali & 20000 wali Post)	43,596	41,586	34,622	83.25	1.10
3	C (13000 Wali Pocket)	13,165	14,510	13,633	93.96	1.20
4	D (Water Tank Wali Pocket)	23,066	19,633	18,575	94.61	1.30
Sub-total		116,992	114,281	99,960	87.47	-
Total		254,592	249,665	223,974	89.71	-

3.1.5 Growth of Plants

Growth of plants was very good in the pockets with ensured irrigation whereas the growth in other pockets where irrigation facilities are far from, the growth was satisfactory.

Though, 59 species of fruit, shady, ornamental, timber and medicinal value were planted but the maximum growth was of Shisham (*Dalbergia sissoo*), Bamboo (*Bamboo species*), Pahari Papri (*Holoptelia integrifolia*), Bakayan (*Melia azadirach*) and Kikar (*Acacia nilotica*).



Shisham Plantation of year 2011-12 in Pocket A



Bamboo Plantation of year 2011-12 in Pocket B



Neem Plantation of year 2011-12 in Pocket B



Kikar Plantation of year 2011-12 in Pocket C

3.1.6 Irrigation System

Irrigation system installed as per approved Plan under CAMPA which has helped a lot in the survival and growth of plantations. It is a unique model in itself and may be replicated at other places. The water stored in mining pits has been successfully utilized for providing irrigation to plantations as well as to wildlife in the sanctuary. It included:

3.1.6.1 Installation of Submersible Pump on the Lake



Irrigation system installed at the lake for irrigation of plantation

3.1.6.2 Installation of Generator for running the Submersible Pump



Generator Set for running the Water lifting system

3.1.6.3 Installation of underground Tanks for Storage and Distribution of Water



Underground tanks for the storage and distribution of irrigation water

3.1.6.4 Installation of Pipes for further Distribution of Water



Pipe line for the distribution of irrigation water

3.1.7 Protection

Protection of land of Asola Bhatti Wildlife Sanctuary against the illegal mining and encroachment and the eco-restoration of the area was the main objective of handing over the area to the ETF and the ETF has achieved this objective up to a great extent. The protection measures taken included:

3.1.7.1 Construction of Posts where ETF staff remains on duty round the clock



ETF Post in Tauwala area

3.1.7.2 Construction of Roads and Path for patrolling



One of the Roads in Asola Bhatti Wildlife Sanctuary

3.1.7.3 Barbed wire Fencing strengthened with locally available biomass and contour trenching for protection of plantations against wildlife



Barbed wire Fencing strengthened with locally available biomass

3.2 Soil and Moisture Conservation (SMC) Works

3.2.1 Contour Trenches

Contour trenches dug up were playing their vital role in the soil and moisture conservation. The survival and growth of plants of planted in the trenches was very good due to availability of adequate moisture and silt. These plants were not counted for evaluation.



SMC Work (Bamboo Plantation in Trench) of 2012-13 in Asola-II

3.2.2 Water Bodies

Water bodies have been constructed in Asola Bhatti Wildlife Sanctuary for the soil and moisture conservation, recharging of sub-soil and for providing drinking water to the wild animals during the pinch period (April to June).

Though, the water bodies were playing their role in soil and moisture conservation and recharging of sub-soil but these were not providing drinking water to the wild animals during the pinch period.

Further, it would have been better if the services of some SMC expert were taken to avoid the following shortcomings:

- i. Small catchment area of water body leading to less collection of water in the pondage area of water body.
- ii. Porous bed of the water body leading to quick absorption of water in sub-soil.
- iii. Absence of adequate intake channels.
- iv. Non-strengthening of embankments.
- v. Use of mechanical machinery for digging the water body.



SMC Work (Inlet of water pond)



SMC Work (Pondage area of water pond)

3.2.3 Check Dams

Earthen check dams have been constructed in Asola Bhatti Wildlife Sanctuary for the soil and moisture conservation.

Though the check dams were playing their role in SMC but it would have been better if the services of some SMC expert were taken to avoid the following shortcomings:

- i. Non-compaction of soil.
- ii. Non-removal of stones.
- iii. Improper side slopes.
- iv. Non-dressing and non-compaction of side slopes.
- v. Non-planting of grass tufts on the outer side slope.
- vi. Ignorance about the concept of core wall and wing walls.
- vii. Less top width.

The above shortcomings may lead to breakage of check dam in case of heavy rains.



Earthen Check Dam

Conclusions

1. Eco-Task Force (ETF) has achieved the main objective of controlling the illegal mining and encroachment as no fresh mining/encroachment was observed in the Asola Bhatti Wildlife Sanctuary.
2. The achievement of CA was 125% against the target of 200,000 plants fixed by the Forest Department under CAMPA.
3. The survival of plantation was very good (89.71%).
4. Though, 59 species of fruit, shady, ornamental, timber and medicinal value were planted but the maximum growth was of Shisham (*Dalbergia sissoo*), Bamboo (*Bamboo species*), Pahari Papri (*Holoptelia integrefolia*), Bakayan (*Melia azadirach*) and Kikar (*Acacia nilotica*).
5. Irrigation system installed has helped a lot in the survival and growth of plantations.
6. The achievement of soil and moisture conservation works was 100% against the target fixed by the Forest Department.
7. Though, the soil and moisture conservation works were serving their purpose up to some extent but these works need technical improvements.
8. The pug marks of female panther were seen during enumeration of plantation by our core team members were a clear indication of improved habitat for the wildlife in Asola Bhatti Wildlife Sanctuary. It is a great achievement of the efforts of Delhi Forest Department.

Recommendations

1. Presence of Eco-Task Force in the Asola Bhatti Wildlife Sanctuary should be continued some more time.
2. Map of Asola Bhatti Wildlife Sanctuary showing all the roads, paths, ETF office and posts, Forest office, lake, monkey feeding points, etc. and the habitations on its boundary along with geo-references should be prepared.

Year wise locations of all the sites of works carried out should be marked on the map.

This map should be updated every year

3. Geo-reference of all the sites of works should be mentioned in the annual reports.
4. Irrigation system should be extended in all the young plantations.
5. Services must be taken of an expert in soil and moisture conservation works.
6. Tree groves of Neem (*Azadirachta indica*), Bad (*Ficus benegalensis*), Pipal (*Ficus religiosa*), Gular (*Ficus racemosa*) and other fruit species should be raised on mounds encircled with deep trench and number of these species should increase in future for habitat improved because this WLS is also being used for sifting of monkeys from habitations.

ANNEXURE-I**List of FCA cases approved by MoEF, GOI and details of CA/Penal CA/NPV realized upto the Year 2012-13**

Sr. No.	Name of the project under FCA	Area diverted (Ha)	Date of final clearance accorded by Ministry	CA area Proposed	NPV realized Rs. in Lakh	Cost of CA (Rs. in Lakh)	Cost of Penal CA	Total of CA/PCA/NPV (Rs. in Lakh)
1.	Diversion of 0.38 ha of forest land for construction of diaphragm wall of underground railway line	0.38	No.91235/2001ROC/1770-71 Dated 27.11.2002	0.38	3.50	-	-	3.50
2.	Diversion of 1.0869 ha of forest land for Upgradation of Talkatora Stadium of NDMC	1.0869	No.9DLB001/2008/CHA/748-52 Dated 22.01.2008	2.2	10.00	61.07	-	71.07
3.	Diversion of 1.134 ha of forest land for construction of Bridge over Neela Hauz of PWD	1.134	No.9DLB949/2007/CHA/747 Dated 22.01.2008	2.3	10.43	63.23	-	73.66
4.	Diversion of 5.56 ha of forest land for construction of Qutub Minar-Gurgaon Corridor of DMRC	5.56	No.9DLB663/2007/CHA/2763 Dated 31.03.2008	11.20	51.15	344.86	-	396.01
5.	Diversion of 2.84 ha of forest land for upgradation of S. P. mukherji Swimming pool Complex of CPWD	2.84	No.9DLB116/2008/CHA/2682 Dated 03.04.2008	3.23	13.71	104.27	-	117.98
6.	Diversion of 6.89 ha of forest land for construction of Airport Express Link of DMRC	6.89	No.9DLB117/2008/CHA/4760-66 Dated 03.06.2008	8.84	63.39	271.07	-	334.46
7.	Diversion of 3.1916 ha of forest land for upgradation/re-construction of Dr. Karni Singh Shooting Range, Tughalkabad	3.1916	No.9DLB610/2008/CHA/11010 Dated 22.12.2008	6.4	29.36	227.58	-	256.94
8.	Diversion of 4.2 ha of deemed forest land for construction of depot at Ghitorani for Qutub Minar-Gurgaon Corridor of MRTS Project of DMRC	4.20	No.9DLB488/2008/CHA/363 Dated 16.01.2009 and No.9DLB488/2008/CHA/970 Dated 17.02.2009	8.4 (CA) + 8.4 (PCA)	38.64	261.15	245.15	544.94
9.	Diversion of 0.94 ha of forest land for construction of 45 m R/w Master Plan road from T-Junction of Mahrauli-Mahipalpur Road and Nelson Mandela road towards southern side from RD o mtr to Rd 1000 mtr for Commonwealth Games	0.94	No.9DLB184/2010/CHA/Dated 27.04.2010	4.89	8.648	140.00	-	148.648
10.	Diversion of 2.80 ha of forest land comprising of 2.2527 ha of deemed forest and 0.5473 ha of PRF for upgradation of NH-236 between Andheria More to Delhi-Haryana Border by NHAI	2.80	No.9DLB636/2010/CHA/820 Dated 24.01.2011	5.60	25.76	191.41	-	217.17
11.	Diversion of 13.00 ha of deemed forest land at Garhi Mandhu for construction of Signature Bridge over river Yamuna by DTDC	13.00	No.9DLB241/2011/CHA/8581Dated 21.10.2011	26.00	111.60	1192.00	-	1303.60
	Total	42.0225		87.84	366.188	2856.64	245.15	3467.978

Abbreviations: CA-Compensatory Afforestation; PCA-Penal CA; NPV- Net Present Value

