



**Restoration of Degraded Forest Habitat:  
Monitoring Report  
Satchari National Park  
2005-06 & 2006-07**

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## Restoration of Degraded Forest Habitat: Monitoring Report Satchari National Park 2005-06 & 2006-07

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## Executive Summary

1. Near about 162 ha of plantations raised by the Forest Department as buffer (2 plantations), enrichment (2 plantations), special fruit tree plantation (one) for Wildlife and one coppice plantation during the FY 2005-06 & 2006-07 in and around Satchari National Park.
2. These plantations were surveyed during October of 2007 by the monitoring team of Nishorgo Support Project. Subsequently for each plantation a separate report was send to Dhaka office for later compilation. This is the compiled report which summarized site preparation activities, species planted, spacing maintained, maintenance operations, survival percentage of planted seedlings and information on other related activities.
3. Survival percentage of seedlings in plantations raised during the FY 2006-07 is above 95% to 100%. The same for plantations established in the FY 2005-06 ranges from 70% to 80% from sample survey. Establishment of Teak Coppice can not be estimated as information on number of coppice retained per ha was not available.
4. Height of the established seedlings/saplings (for teak coppice) for 2005-06 plantations ranges from 2.5 meter for buffer, 1.15 meter for enrichment and 5 meter for coppice plantation. The same for 2006-07 plantations ranges around 1 meter.
5. In adjacent Reserved Forest areas at Satchari and Telmachara Beat buffer plantations were raised, main species being Acacia Hybrid. Although Plantation Journal of Telmachara Beat mentioned that species like Gamar, Chickrassi & Bohera were also was planted, but in our sample survey only Acacia hybrid was found.
6. Enrichment plantations or special fruit tree plantations for wildlife were raised with local forest species, with emphasis on fruit bearing species **inside of National Park and outside as well** in places dominated by scattered trees along with weeds and bush.
7. For some plantations, weed species was found to be suppressing the established seedlings despite regular operations due to high rain fall. In this context, CMC can and may provide support by deploying community members / beneficiaries if properly approached. Such initiative will not only save cost but also increase ownership of the community.
8. Forest Department was found to maintain plantation journal.
9. In all cases & in varying degrees, CMC members were informed, consulted and involved in plantation activities.

## 1. Background of the Report

Forest Department under Nishorgo Support Project has been doing different habitat restoration activities since FY 2005-06 and 2006-07 in and around the five pilot Protected Areas under Component 2 of contract between USAID & IRG (stated as Objective 6 of approved PP). Major habitat restoration activities include raising enrichment, buffer, special fruit/fodder tree plantation, assisted natural regeneration, grass plantation etc. Operationally, raising of these plantation and subsequent monitoring activities are done by the Department itself. However, the Project Director recently in a letter has recently asked monitoring team members of Nishorgo to actively engage in the monitoring of these plantation activities with a view to help field level FD's officials to properly raise these plantation according to the guidelines specified in the respective management plans and also to amend error, if any, while doing such activity. Accordingly, methodology and format for data collection was developed in Dhaka and distributed to field level monitoring officials of NSP for data collection. Based on the format and methodology, brief reports on each type of plantations were sent back to Dhaka office for compilation. This compiled Plantation Monitoring Report of Satchari National Park is based upon reports done by Gazi Sazzad Hossain, PMO northern region, and compiling, mapping and editing by Nasim Aziz (ESMS).

## 2. Objectives of the Report

The objectives of the report are:

- to show performance of the raised plantation and
- to identify any irregularities
- to suggest better species selection if needed
- to suggest better site selection if needed

## 3. Scope of the Report

It has to be noted that Nishorgo monitoring team was authorized only to monitor plantation raised under the FY 2006-07. The team however felt that it would be more helpful for the purpose of documentation if plantation raised under FY 2005-06 also been evaluated. Hence, plantation raised by the Department under Nishorgo Support Project for both FY 2005-06 & FY 2006-07 were monitored (Table 1).

The survey was limited only to **the performance** of the raised plantation (Table 1), **not the financial evaluation** of the related activities.

**Table 1: Plantation raised under Nishorgo Support Project at Satchari National Park**

Sl	Year	Plantation Type	Forest Division	Range	Beat	Area (ha)
1	2005-06	Buffer Zone	WMND	Satchari WR	Satchari	10
2		Enrichment	WMND	Satchari WR	Satchari	30
3		Teak Coppice	WMND	Satchari WR	Satchari	5
4	2006-07	Buffer Zone	WMND	Satchari WR	Telmachara	49.32
6		Enrichment	WMND	Satchari WR	Satchari	17
7		Special fruit trees for WL.	WMND	Satchari WR	Satchari	50.47

Note: WMND – Wildlife Management & Nature Conservation Division, Sylhet; WR – Wildlife Range

## **4. Methodology**

There are different ways of monitoring plantations. We the monitoring team of NSP consulted Working Plan Division of Forest Department so that our methods are similar to that of FD's to avoid any confusion and to be consistent in the methodology. In the sections below, the traditional rules and the methods we followed are described below.

### **4.1 Buffer Plantation**

Generally Forest Department has some thumb rules to raise different kinds of plantation. For block/woodlot plantation (i.e., buffer plantation) the rule is to plant 2500 seedlings in 1 ha area. Similarly for ease of monitoring couple of sample plots of 0.01 ha is taken where survival percentage is measured. For 100% successful plantation, 25 seedlings have to survive in the sampled 0.01 ha. Generally, if average survival percentage is equal or greater than 80, then it is considered a successful plantation and vice-versa. Such plots were laid out for evaluating performance of the buffer plantations mentioned above (Table 1).

Again, for evaluation, generally Forest Department lays out 0.01 ha plots per hectare. As total area of buffer plantation raised in 2005-06 and 2006-07 is 73 ha (Table 1), a total of 73 plots of 0.01 ha is required for evaluation. However, number of plots becomes too many for timely evaluation and hence 5 well spread out plots were established for each buffer plantation (in this case 3 buffer plantation X 5 plots = 15 plots of 0.01 ha).

### **4.2 Enrichment Plantation**

Evaluating enrichment plantation is difficult as seedlings are planted sporadically over an open canopy area to enrich the existing trees. In such case, easy way to evaluate is to take some individual seedlings as a sample. Another method is to lay a transect (of workable width and length based on situation in the field) then subsequently measure number of seedlings found planted and survived. In both cases, number of seedlings planted for enrichment needs to be known.

At Satchari National Park, for evaluating 97 ha enrichment & special fruit tree plantations, 0.1 ha circular plots were established (Table 1).

### **4.3 Coppice Plantation**

Traditional method of raising coppice plantation is to retain 300 saplings per hectare provided that the existing plantation is monoculture. Depending on the type of plantation and existing situation in the field the number of retained coppice may vary. In any case, the number of saplings retained should be documented while raising such coppice plantation.

For monitoring Teak coppice plantation, sample plot of 0.1 ha was laid out.

### **4.4 Data Collected**

Apart from data to measure survival percentage, additional data was collected (tried to collect) on:

- GPS location of each plantation,

- planting materials (age and height),
- species wise number of seedlings,
- site preparation activity, spacing,
- soil works and treatment,
- protection activity,
- weeding & refilling,
- if consultation with CMC was done while or before plantation activity and lastly
- if plantation journal was maintained properly.

## **5. Limitation of the collected data**

1. The survey couldn't actually measure the area reported for various plantation to see actually if there is any discrepancy in the reported area and actual area in the field. It was planned that traversing the boundary of each plantation will be done using hand held GPS to map the raised plantation and subsequent area estimation. Due to heavy rainfall, and heavy undergrowth the attempt failed and later abandoned. Only the point location was taken and mapped.
2. Due to heavy rainfall and limitation of time, statistically adequate samples/ plots could not be taken for each type of plantation.

## **5. Observations**

### **5.1 Site Preparation Activities**

1. For all plantations of different kinds, site preparation works were taken before hand. These works includes bush clearing, alignment and stacking (spacing), pit digging & or soil treatment.
2. Depending on the type of plantation spacing varied, however, 2m by 2m spacing was maintained for all buffer plantations. For other plantations the spacing varied.
3. Soil was mixed with dung and chemical fertilizer at the ration of 2:2:1 only for only enrichment & special fruit tree plantation of 2006-07.
4. Spot weeding of 1 meter dia around planting spot was done for enrichment plantation.

### **6.2 Number & Species Selection**

5. For buffer plantation 2500 seedlings per ha, enrichment plantation 625 seedlings, and for special fruit tree plantation 1250 seedlings per hectare was planted.
6. For buffer plantations main species was Acacia hybrid as per the Simplified Management Guidelines of Satchari National Park (2006). Species like Gamar, Chikrashi, Bohera were used in addition to Acacia hybrid according to Plantation Journal for Telmachara Beat, however, sample survey found on the Acacia species.
7. Coppice of Teak (5 ha) was retained in the previous Teak plantation south of National Park. However, number of saplings retained was not found. The best saplings of above or equal to 1 feet height were retained. The Simplified Management Guidelines of SNP (2006) however does not mention any procedure to maintain / enhance coppice plantation.

**Table 2: Summary of Plantation Activities in the Plantation Raised at Satchari National Park**

Sl	Year	Plantation Type	Beat	Area (ha)	Site Preparation & soil works	Number of seedlings	Maintenance & Refilling	Plantation Journal	Cost in Taka
1	2005-06	Buffer Plantation	Satchari	10	Purchased & raised seedlings, age: 1year, height: 90 cm; Bush Cutting, alignment and stacking was done; 2mX2m spacing; Pit size: 45cm X 45cm X 45cm.	100% hybrid Acacia; 25,000 nos	Gap felling & weeding done.	At DFO office for approval.	2,81,250
2	2005-06	Enrichment	Satchari inside National Park	30	Raised and purchased; age: 1year, height: 90 cm; spacing minimum 15 feet depending on tree presence; Pit:1.5/1.5/1.5 feet; no soil treatment.	18,750 nos of seedlings of fruit bearing forest trees.	Weeding or gap filling done.	Yes; available.	2,25,000
3	2005-06	Teak Coppice	Satchari	5	Best coppice (1feet) kept, cutting down (1.5feet radius) others coppice, bamboo stick tied with that coppice and then soil is put on the lower portion of the stump.	no information about number of coppice retained.	Weeding done.	Yes; available.	25,000
4	2006-07	Buffer Zone	Telmachara	49.32	Seedlings raised and purchased, age: 0.6 yr, height: 60cm; Cutting was done; Alignment and stacking was done; 2mX2m spacing; Pit size: 45cmX45cmX45cm	Acacia hybrid, Gamar, Chikrashi, Bohera 125,000 nos;	Gap filling & weeding done.	Yes; available.	9,43,627.4
5	2006-07	Enrichment, outside NP	Satchari	17	Raised and purchased, age: 1yr. Ht: 90cm; clearing (1.0 m dia) at planting spot, 1 kg cow dung and chemical fertilizer at the ratio of 2:2:1 was used, no spacing, wherever suitable; No Soil treatments.	10,625 nos seedlings of indigenous forest trees	Gap filling & weeding done.	Yes; available.	1,14,504
6	2006-07	Special fruit trees for WL	Satchari Beat (45ha) & NP (5.47 ha)	50.47	Raised and purchased, age: 1yr. Ht: 90cm; Spot clearing, no spacing, Pit: 45cm X45cmX45cm; 1 kg cow dung and chemical fertilizer at the ratio of 2:2:1 was used.	63,088 nos seedlings of indigenous forest trees	Gap filling & weeding done.	Yes; available.	6,79,875



**Table 3: Summary of Performance of Plantations Raised at Satchari National Park under Nishorgo Support Project**

Sl	Year	Plantation Type	Beat	Area (ha)	Survival (%)*	Avg height (m or cm)	Consultation with CMC	Problems	Recommendations
1	2005-06	Buffer Plantation	Satchari	10	72	2.5m	Discussed in the CMC meeting and participants were selected consulting with CMC.	Some participants have not received their plot and don't take care of the plantation.	MOU should always be done before or during plantation activity. Delayed handover of the MOU / agreement always cause problems.
2	2005-06	Enrichment	Satchari inside National Park	30	80	1.15m	Yes	Weed infestation.	Weeding should be done immediately. There is evidence of natural regeneration which can be assisted through proper weeding (spot clearing).
3	2005-06	Teak Coppice	Satchari	5	Unknown, see column 7, Table 2.	5m	Yes, informed.	Weed has grown again, Illicit felling.	Weeding is needed. Community patrolling should be intensified to protect illegal felling of existing Teak trees.
4	2006-07	Buffer Zone	Telmachara	49.32	100	75cm	Yes, about plantation activity, participant selection, CMC monitored.	No apparent weed infestation.	MOU with the beneficiaries should be done before plantation work.
5	2006-07	Enrichment, outside NP	Satchari	17	96	1m	Discussed at CMC meeting about plantation activities.	Weed, & reed - Nalkhagra ( <i>Phragmites karka</i> )	Weeding necessary. Nalkhagra can not withstand repeated cutting, it can also be used as fodder for cattle.
6	2006-07	Special fruit trees for WL	Satchari Beat (45ha) & NP (5.47 ha)	50.47	96	1m	Yes, informed	Weed infestation.	Range Officer suggested weeding should be done 4 times a year.

\* Note – this figure was estimated before gap filling work.

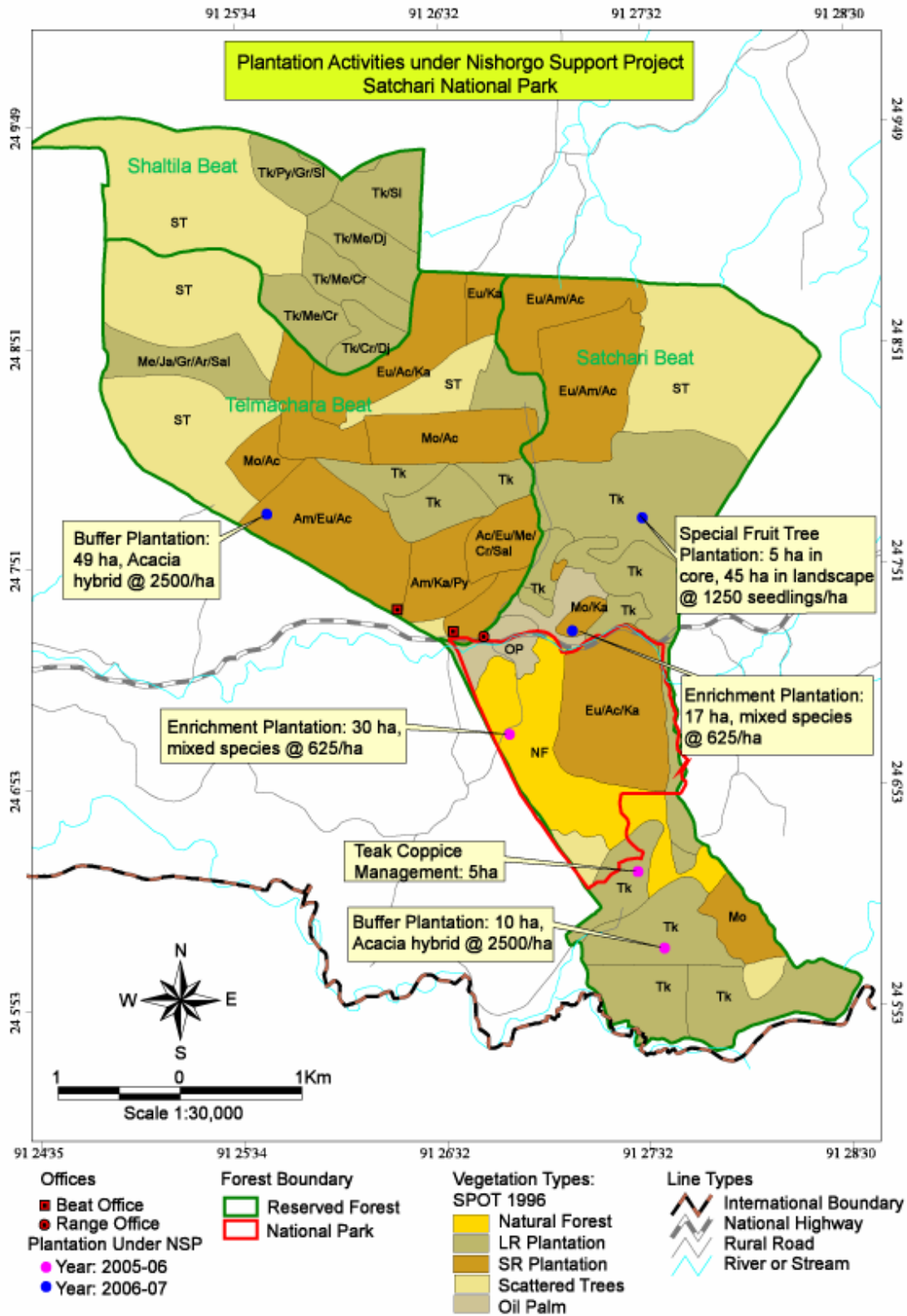


Figure 1: Location of Plantation Sites Raised under Nishorgo Support Project

8. Species wise number of seedlings planted for two enrichment plantations raised in 2005-06 & 2006-07 and one special fruit tree plantation of 2006-07 was not found in the plantation journal. However, the following Table (4) list the types of species used.

**Table 4: Species used in enrichment & special fruit tree Plantation**

SI No	Species
1	Chandan
2	Jam
3	Amloki
4	Bahera
5	Chapalish
6	Lukluki
7	Guava
8	Jackfruit
9	Horitoki
10	Mango
11	Dumur
12	Gamar
13	Tetul
14	Jolpai
15	Neem
16	Chalta
17	Sonalu

9. Choice of species found to be appropriate as per management guideline, giving preference to fruit bearing trees, which in future will ensure food supplies for wildlife therein (it seems from the list that fruit trees are of domesticated types, not the forest varieties, for example, mango can be of two variety, Uri Amm is forest variety which apparently was not use, similar is applicable for Jackfruit or Jam, Guava).

### **6.3 Maintenance & Refilling**

10. Weeding and/or refilling have been done so far for plantations. But due to heavy rainfall and faster growth of weed species enrichment plantations requires further weeding (Table 2 & 3).
11. Management guideline prescribes weeding operations for enrichment plantation as - 3 weeding operations in 2<sup>nd</sup> year and 2 weeding operation in 3<sup>rd</sup> year.

### **6.4 Seedlings Establishment**

12. Survival percentage of plantations raised in FY 2006-07 was found to be very satisfactory more than 95% survival rate (Table 3) based on the samples taken and can be said to be successful due to more than 80% survival rate.
13. Comparatively lower survival percentage (70-80%) of the 2005-06 plantations may be due to competitions from weed species and less protection / or care from the beneficiaries for buffer plantation. This issue was raised by the Range Officer at CMC meetings and through CMC, beneficiaries were asked to sign MOU. All the documents have sent to DFO office for approval. After getting approval it will be handed over to the participants.

14. Growth of planted seedlings in general was also found to be satisfactory (Table 3).

#### **6.5 Site Selection**

15. Overall site selection followed the general norms i.e., indigenous local species in core area and fast growing species in adjacent buffer area (Reserved Forest).

16. Although it is not mentioned (or prohibited) in the simplified Management Guidelines that enrichment plantations can not be done outside core area, but two enrichment plantations of FY 2006-07 were done adjacent reserved forest to National Park. This may help to extend food availability for wildlife outside the National Park.

#### **6.6 Documentation**

17. Plantation journal was prepared for all plantations (Table 2).

18. However, proper information is some times lacking, like for coppice plantation, number of saplings retained per hectare or number of seedling planted by species in enrichment plantations.

#### **6.7 Consultations with CMC Members**

19. Reported by local level FD staffs that for all plantations, CMC members were informed, consulted and necessary field visit was done by the CMC members.