



**USAID**  
FROM THE AMERICAN PEOPLE

*ipac*

# INTEGRATED PROTECTED AREA CO-MANAGEMENT (IPAC)

## GROWING STOCKS OF THE SUNDARBAN RESERVED FOREST



**November 11, 2010**

This report was produced by IRG for review by the United States Agency for International Development under Contract No. EPP-1-00-06-00007-00

# INTEGRATED PROTECTED AREA CO-MANAGEMENT (IPAC)

## GROWING STOCKS OF THE SUNDARBAN RESERVED FOREST

**USAID Contract N° EPP-I-00-06-00007-00**

Order No : EPP-I-01-06-00007-00

*Submitted to :*

**USAID/Bangladesh**

*Prepared by:*

**Dr. M. A. Latif**

***Ex-Director, Bangladesh Forest Research Institute, Chittagong***

*Submitted for :*

**International Resources Group (IRG)**

With subcontractors:

WWF-USA, dTS, East-West Center

Environmental Law Institute, Epler-Wood International

World Fish Center, CIPD, CNRS, CODEC

BELA, Asiatic M&C, Oasis Transformation

Module Architects, IUB/JU



**International Resources Group**

12 11 Connecticut Avenue, NW, Suite 700

Washington, DC 20036

202-289-0100 Fax 202-289-7601

[www.irgltd.com](http://www.irgltd.com)

# Table of Contents

Executive Summary .....	1
1. Introduction .....	2
2. Materials and Methods.....	2
3. Results and Discussions .....	5
4. Goran Results .....	12
5. Species Composition of Sundarban .....	13
6. Annual Allowable Cut (AAC) .....	15
7. Comparison of the Result with Previous Inventories.....	16
8. References .....	19
Annex 1: List of Tables Prepared to Meet to Write IRMP for the SRF.....	20

## List of Tables

Table 1: Plant categories, plant sizes and plot radii used for the inventory data collection .....	2
Table 2: Statistics estimated for different plant sizes for data compilation in Sundarban in 2009.....	3
Table 3: Seedlings, saplings and poles for the years 2009 and 1996 in the Sundarbans .....	6
Table 4: Differences/Changes in between 2009 and 1996 for seedlings, saplings and poles.....	6
Table 5: Trees Statistics (N/ha, BA (m <sup>2</sup> ) and V10 (m <sup>3</sup> ) in 2009 for different DBH (cm) classes and important species.....	8
Table 6: Differences in between 2009 and 1996 for trees Statistics in DBH (cm) Classes and Species (data 2009 - data 1996) .....	9
Table 7: The Change for different statistics expressed in percentage (%) for Sundarban in 2009 from 1996	9
Table 8: Volume of poles (DBH 10-15 cm) and Trees in Sundarban in 2009 & 1996 .....	9
Table 9: DBH (cm) class distribution of different important species of Sundarbans in 2009 & 1996.....	10

Table 10: Goran in different size classes (N/ha, Volume & Weight) in Sundarban in 2009 & 1996.....	12
Table 11: Comparative species compositions in 2009 and 1996 .....	13
Table 12: Annual Allowable Cut (AAC) for different species in the Sundarban RF .....	15
Table 13: Comparative per hectare estimate of no. of trees and volumes of trees 15-cm DBH and bigger..	16
Table 14: Comparative per hectare estimate for number of stems of big pole & trees 10-cm DBH and bigger .....	18
Table 15: Tree Volumes V10 (m <sup>3</sup> ) by compartment and species, 15 cm+ DBH in Sundarban in 2009.....	20
Table 16: Tree Number (N/ha) by compartment and species, 15 cm +DBH in Sundarban in 2009 .....	21
Table 17: Tree Basal Area (BA, m <sup>2</sup> ) by compartment and species, 15 cm+ DBH in Sundarban in 2009 ..	22
Table 18: Change in volume (m <sup>3</sup> ) for trees in between 2009 and 1996 by compartment and species.....	23
Table 19: Change in number of trees in between 2009 and 1996 by compartment and species .....	24
Table 20: Tree Volume (m <sup>3</sup> ) for sundri by compartment and DBH class, 15 cm+ DBH in in 2009 .....	25
Table 21: Tree number for sundri by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009 ...	26
Table 22: Tree Volume (m <sup>3</sup> ) for Gewa by compartment and DBH class in Sundarban in 2009 .....	28
Table 23: Tree number for gewa by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009.....	29
Table 24: Tree Volume (m <sup>3</sup> ) for keora species by compartment and DBH class .....	30
Table 25: Tree number for keora species by compartment and DBH class, 15 cm+ DBH .....	30
Table 26: Tree Volume (m <sup>3</sup> ) for baen by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009 .....	30
Table 27: Tree number for baen by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009.....	31
Table 28: Tree Volume (m <sup>3</sup> ) for other species by compartment and DBH class .....	32
Table 29: Tree number for other species by compartment and DBH class, 15 cm+ DBH.....	33
Table 30: Goran in different size classes (Volume, Weight and N/ha) in different compartments.....	34
Table 31: Number of saplings and Poles by Compartment and DBH class.....	35
Table 31: (Continued) Number of saplings and Poles by Compartment and DBH class .....	36

Table 32: Distribution of volume (V10/ha) of poles 10-15 cm DBH class in Sundarban in 2009 .....	37
Table 33: Distribution of number of stems of poles 10-15 cm DBH class in Sundarban in 2009.....	38
Table 34: Tree Volumes V10 (m <sup>3</sup> ) by compartment and species, 15 cm+ DBH in Sundarban in 1996.....	40

## List of Figures

Figure 1: The number of poles of different sizes and trees (N/ha) in 2009 and in 1996 .....	7
Figure 2: Volumes of big poles and trees in Sundarban in 2009 & 1996 .....	10
Figure 3: Diameter class distribution (N/ha) for sundri in the Sundarban in 2009 and 1996.....	11
Figure 4: Diameter class distribution (N/ha) for gewa in the Sundarban in 2009 and 1996.....	11
Figure 5: Diameter class distribution (N/ha) for other species in the Sundarban in 2009 and 1996 .....	12
Figure 6: Change in species (Trees) compositions in the Sundarban during the period 1996 to 2009.....	14
Figure 7: Change in species (Poles+ Trees) compositions in the Sundarban during the period 1996 to 2009 .....	14
Figure 8: Estimated Annual Allowable Cut (AAC) for different species in Sundarban.....	16
Figure 9: Comparison of stems/ha with previous inventories of Sundarban .....	17
Figure 10: Comparison of V10/ha (cum) with previous inventories of Sundarban.....	17
Figure 11: Estimate for number of stems/ha of big pole & trees 10-cm DBH and bigger .....	18

## Executive Summary

Two sets of tree measurement data of 1996-97 and 2009-10 of the Sundarban Reserved Forest, made available by the Forest Department, the data were analyzed and different tables for the important species of the Sundarban were prepared. It was observed from the analyzed data that the number of seedlings (height<1.5m), poles ( $2.5 \text{ cm} \leq \text{DBH} \leq 14.9 \text{ cm}$ ) and tree ( $\text{DBH} \geq 15.0 \text{ cm}$ ) have increased since 1996. Only, Keora was the exception as the no. this species has decreased. The basal area (BA/ha,  $\text{m}^2$ ) and volume (V10/ha,  $\text{m}^3$ ) of the big poles ( $10 \text{ cm} \leq \text{DBH} \leq 14.9 \text{ cm}$ ) and trees have also increased but keora has decreased.

The Annual Allowable Cut (AAC) was also estimated and it was found that significant resources are available for harvest. But, considering different factors, only the present prescribed level of harvest as per the on-going Working Plan for the Sundarban Reserved Forest is suggested to be implemented, in case the Government of Bangladesh decides to lift the ban on tree felling.

About 19 additional tables required for writing the IRMP were prepared to estimate the number of stems/ha, BA/ha and volumes/ha for the important species of the Sundarbans in different Compartments. The tables have been included in the report.

# I. Introduction

The Sundarban Reserved Forest (SRF) is the largest continuous mangrove forest tract in the world. The forest is being scientifically managed since long. By the time, the resources of the SRF were inventoried in 1959-61 (Canadian Forestry Forestal), 1981-85 (ODA), 1995-1997 (FRMP) and latest re-measurements of the selected 150 sample clusters (plots) were taken in 2009-2010 by the assistance of US Forest Service (USAID). These 150 sample clusters (plots) were selected from the 1204 sample plots laid out during FRMP inventory. The data collection procedures were approximately similar to full fill the objectives of the studies. This Report on Volume Assessment for IRMP includes existing growing stock and temporal assessments, and annual allowable cut based on the 2009-2010 data.

## 2. Materials and Methods

A detailed inventory of the Sundarban Reserved Forests in Bangladesh was carried out in 1995-1997 (Revilla, 1996). Data were collected approximately from 1204 sample plots for the inventory and data of 150 sample plots were available for the present study. USDA Forest Service made carbon assessment of the Sundarban collecting data from these 150 sample plots (Donato *et al* 2009). Data of this carbon assessment was also available. These two sets of data were used to prepare the present report.

Data from the 150 sample plots of the 1995-1997 inventory were compiled (Table 3-7) and compared with the report prepared from 1204 sample plots (Tables at pages 27-30 and 92-95, Revilla 1996). It was observed that the results of the analyses are approximately similar and comparable. Then data collected by USDA Forest Service were compiled following the same procedures. The data were organized as given Table 1.

Table 1: Plant categories, plant sizes and plot radii used for the inventory data collection

Plant category	Size (DBH in cm)	Plot radius in 1996 (meters)	Plot radius in 2009 (meters)
Seedlings	Height < 1.5 m	1.0	2.0
Saplings	0-2.4	2.0	2.0
Small Poles	2.5-9.9	5.0	2.0
Big Poles	10.0-14.9	5.0	10.0
Trees	DBH $\geq$ 15.0	11.0	10.0
Goran			2.0
Size Class	Stem Size at Base	Mean biomass of stems (kg/stem):	
Small	0 - 0.6 cm	Small	0.000

Medium	0.6 - 2.5 cm	Medium	0.336
Large	2.5 - 7.6 cm	Large	3.637
Extra-Large	> 7.6 cm	X-large	10.551

The data were categorized and analyzed as given in Table 2:

Table 2: Statistics estimated for different plant sizes for data compilation in Sundarban in 2009

Plant category	Estimated
Seedlings	Number of stems per hectare (N/ha) for sundri, gewa, keora, baen and other species grouped together as "Others".
Saplings	N/ha for sundri, gewa, keora, baen and other species grouped together as "Others".
Small Poles	N/ha for 2.5-4.9 cm and 5.0-9.99 cm DBH classes for sundri, gewa, keora, baen and other species grouped together as "Others".
Big Poles	N/ha, Basal area per hectare in m <sup>2</sup> (BA/ha) and Volume up to 10.0 cm top end diameter in cubic meters (m <sup>3</sup> ) per hectare (V10/ha) for sundri, gewa, keora, baen and other species grouped together as "Others".
Trees	N/ha, BA/ha and V10/ha for different DBH classes and Total for sundri, gewa, keora, baen and other species grouped together as "Others".

The data were compiled using the normal procedures as given below:

Statistics	Estimation procedures	Remarks
N/ha	Total number of stems recorded in the samples/sampled area	
BA/ha, m <sup>2</sup>	$\sum \pi * (DBH/2)^2 / \text{sampled area}$	
V10/ha, m <sup>3</sup>	Different volume equations developed by FRMP inventory as given below (Revilla, 1996) were used to estimate the volume of each big pole and tree:	
Species	Volume Equations:	
Sundri	$V10 = -0.00006083 * D^{1.9631} * h^{0.8270}$	V10=0 if D<10
Gewa	$V10 = 0.0004218 * D^2 - 0.002032 - 0.2506/D$	V10=0 if D<10
Keora	$\ln(V10ub) = -15.9104 + 5.1158 * \ln(D) - 0.0707/D$	If D>+72, Otherwise V10ub = 2.407
Passur	$\ln(V10ub) = 10.3302 + 3.0802 * \ln(D) - 0.03026 * d$	If H>+10.7, D<12
Dundul	V10ub= 0.040	if 10<=D<12



	$V_{10ub} = 0.070$	if $12 \leq D < 17.5$
	$V_{10ub} = 0.153$	if $17.6 \leq D < 22.5$
	$V_{10ub} = 0.289$	if $22.6 \leq D < 27.5$
	$V_{10ub} = 0.436$	if $D > 27.5$
Kankra	$\ln(V_{10ub}) = -6.6346 + 1.4818 \cdot \ln(D) + 0.02088 \cdot D$	if $H > 10.7$
	$\ln(V_{10ub}) = -7.4828 + 1.7169 \cdot \ln(D) + 0.01095 \cdot D$	if $h < 10.7$
Baen	$\ln(V_{10ub}) = -9.4214 + 2.610 \cdot \ln(D) - 0.01155 \cdot D$	
Goran	$V_t = 0.001429 - 0.001111 \cdot D + 0.0004294 \cdot D^2$	
	$W_t(\text{KG}) = 1.337 - 0.8816 \cdot D + 0.3876 \cdot D^2$	
Misc. tree	$\ln(V_{10ub}) = -10.8153 + 3.2840 \cdot \ln(D) - 0.05561 \cdot D$	if $D < 59$ , Other wise $V_{10ub} = 0.494$
Where:	D is Diameter at Breast Height in centimeter	
	H is Height in meters	

The basal areas (BA) of each big pole and tree were estimated with the formula  $\pi \cdot (\text{DBH}/2)^2$ . Then the basal area for each big pole and tree was added to get the total for each species as required and then these totals were divided by the sampled area to convert to per hectare basis. It was observed that at about 700 sub-plots out of 750 sub-plots of 150 plots seedlings/saplings/poles/trees were available. Similarly, the volume of each big pole and tree were estimated first by using the desired volume equation followed by conversion per hectare basis.

### 3. Results and Discussions

The number of seedlings, saplings, poles and trees for whole of the Sundarban Reserve Forest (SRF) on per hectare basis for sundri, gewa, keora, baen, and other species grouped together as “Others” and total for all the species have been estimated and presented in Table 3. Similarly, the basal area in square meters (BA/ha,  $M^2$ ) and volumes ( $V_{10}$ /ha,  $M^3$ ) of poles (DBH 10-15 cm size) and trees of different DBH classes for sundri, gewa, keora, baen, others and total for all the species for the whole of SRF on per hectare basis (ha) have also been estimated and presented in Tables 3 & 5. To estimate the change of different statistics, the differences of these statistics have also been estimated and presented in Tables 4 & 6. The changes expressed in percents are given in Table 7.

From the results it shows that, about 53806 number of seedlings per hectare were grown in 2009 compared to 34723 number of seedlings per hectare in 1996. The reasons for this big increase are the fact that the seedlings grow during rainy seasons and gradually a portion die out during the dry seasons and so only a small portion of seedlings survive. Siddiqi (1988) reported from his seven years study that the average number of seedlings regeneration in each year is about 35, 625 number per hectare. So, the seedlings number in 1996 is very close to the average and 2009 data is on high side.

The total number of saplings for all the species survived is 5545 per hectare in 2009 which is less compared to 8088 number of saplings per hectare in 1996. The decrease for saplings (N/ha) is about 31%.

The total number of poles for all the species of sizes 2.5-5.0 cm and 5.0-10.0 cm DBH classes increased from 1008 to 5003 & 1133 to 4364 per hectare, which is about 31 and 21 percent increase respectively. The detailed estimates for the species sundri, gewa, keora, baen and all the remaining species grouped together as “others” are given in Tables 3-7. The number of poles of size 10-15 cm DBH classes and number of trees for all the species have also increased from 384 to 507 & 142.4 to 297.48 respectively, which are about 396% and 109% increase respectively. Similarly, the BA/ha and  $V_{10}$ /ha for poles of DBH class 10-15 cm and trees increased about 285, 32, 113 & 135 percent respectively. The tree N/ha, BA/ha and  $V_{10}$ /ha have increased for all the DBH classes. The volume increment for the species sundri was 29.188  $m^3$ /ha (from 19.016  $m^3$ /ha in 1996 to 48.204  $m^3$ /ha in 2009) (Table 5 & 6). Similarly, the volume increment for the species gewa was 5.572  $m^3$ /ha (from 2.268  $m^3$ /ha in 1996 to 7.84  $m^3$ /ha in 2009).

Table 3: Seedlings, saplings and poles for the years 2009 and 1996 in the Sundarbans

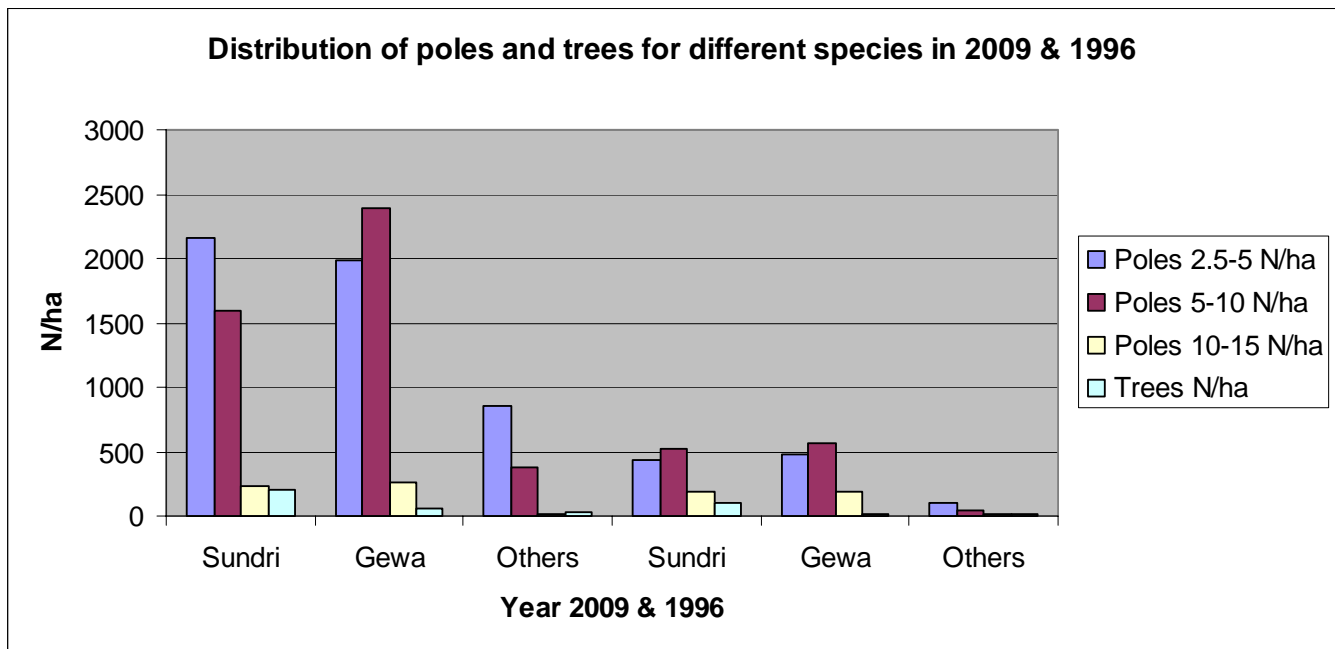
Year 2009	Seedlings	Saplings	Poles in DBH class in cm				
Size class	Ht<1.5m	DBH<2.5 cm	2.5 – 5	5 -10	10-15		
Species	N/ha	N/ha	N/ha	N/ha	N/ha	BA/Ha (m <sup>2</sup> )	V10/ha (m <sup>3</sup> )
Sundri	34776	3044	2166	1596	234	2.818	13.922
Gewa	13235	1266	1984	2393	255	2.929	9.844
Baen	42	0	0	0	0	0.001	0.005
Keora	5	5	3	9	1	0.016	0.067
Others	5748	1231	850	366	17	0.199	0.651
Total	53806	5547	5003	4364	507	5.963	24.490
Year 1996							
Species	N/ha	N/ha	N/ha	N/ha	N/ha	BA/Ha(m <sup>2</sup> )	V10/ha (m <sup>3</sup> )
Sundri	20522	3957	428	523	188	2.165	10.397
Gewa	5971	2627	476	560	184	2.045	6.647
Baen	23	6	1	1	1	0.002	0.005
Keora	5	3	1	0	0	0.006	0.025
Others	8203	1495	100	49	10	0.118	0.384
Total	34723	8088	1008	1133	384	4.336	17.457

Table 4: Differences/Changes in between 2009 and 1996 for seedlings, saplings and poles

	Seedlings H<1.5 m	Saplings D<2.5	Poles 2.5-5	Poles 5-10	Poles 10-15 cm DBH (D)		
Species	N/ha	N/ha	N/ha	N/ha	N/ha	BA/Ha (m <sup>2</sup> )	V10/ha (m <sup>3</sup> )
Sundri	14255	-913	1737	1073	46	0.653	3.525
Gewa	7264	-1361	1508	1833	70	0.884	3.197
Baen	19	-6	-1	-1	0	-0.001	0.000
Keora	0	1	2	9	1	0.010	0.042
Others	-2456	-264	750	317	7	0.082	0.267
Total	19083	-2542	3995	3231	123	1.627	7.032

The number of trees (N/ha), Basal Area (BA/ha, m<sup>2</sup>) and volume up to 10 cm top end diameters (V10/ha, m<sup>3</sup>) for the poles with DBH 10-15 cm have increased for all the important species (Table 4). The number of trees per hectare (N/ha), BA/ha and V10/ha has increased for all the species sundri, gewa, baen and others (Table 6). Only, keora has decreased. The N/ha for poles and trees have also been shown in Figure 1 to show the change.

Figure 1: The number of poles of different sizes and trees (N/ha) in 2009 and in 1996



From the data, it was observed that the number of seedlings is high followed by reduction of number of saplings. So, some positive and good measures may be taken to increase the number of saplings followed by small poles. There are scopes as there are a huge number of seedlings.

The volumes of the big poles and trees for all the species (sundri, gewa, keora + baen + others as others) are given in Table 8. The figures are given in Figure 2 to have a clear overview.

The distribution of numbers of saplings, poles and trees for sundri, gewa, keora, baen and others in different DBH classes have been estimated for 1996 and 2009 (Table 9). The data have been also shown in Figure 3, & 5 for sundri, gewa and other together for a clear overview.

Table 5: Trees Statistics (N/ha, BA (m<sup>2</sup>) and V10 (m<sup>3</sup>) in 2009 for different DBH (cm) classes and important species

Year 2009												
DBH Class	15-20			20-25			25-30			30-40		
Species	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha
Sundri	117.4	2.733	16.028	54.02	2.084	14.479	21.69	1.235	8.883	10.64	0.931	6.917
Gewa	50.0	1.116	5.143	8.78	0.323	1.613	2.18	0.121	0.623	0.73	0.065	0.344
Keora	0.2	0.004	0.012	0.18	0.007	0.039	0.18	0.010	0.070	0.36	0.033	0.271
Baen	0.7	0.018	0.088	0.68	0.028	0.148	0.73	0.042	0.234	0.82	0.075	0.449
Others	7.4	0.171	0.648	6.09	0.238	0.948	4.64	0.276	1.076	4.23	0.392	1.381
Total	175.7	4.042	21.919	69.76	2.680	17.227	29.42	1.684	10.885	16.78	1.496	9.362
DBH Class	40-50			50-60			60+			Total		
Species	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha
Sundri	1.09	0.164	1.203	0.32	0.066	0.485	0.09	0.029	0.211	205.26	7.242	48.204
Gewa	0.14	0.022	0.118	0.00	0.000	0.000	0.00	0.000	0.000	61.80	1.647	7.840
Keora	0.27	0.041	0.379	0.05	0.009	0.083	0.09	0.034	0.212	1.32	0.139	1.066
Baen	0.50	0.076	0.471	0.36	0.085	0.535	0.82	0.655	3.147	4.64	0.978	5.071
Others	1.36	0.199	0.578	0.50	0.112	0.242	0.23	0.072	0.111	24.46	1.461	4.984
Total	3.36	0.502	2.748	1.23	0.272	1.344	1.23	0.790	3.681	297.48	11.467	67.166
Year 1996												
DBH Class	15-20			20-25			25-30			30-40		
Species	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha
Sundri	63.4	1.509	7.874	30.4	1.157	6.613	8.4	0.473	2.880	2.6	0.217	1.413
Gewa	14.4	0.320	1.473	3.0	0.116	0.580	0.6	0.032	0.164	0.1	0.010	0.052
Keora	0.4	0.010	0.034	0.3	0.013	0.070	0.1	0.007	0.045	0.8	0.072	0.611
Baen	0.6	0.014	0.068	0.6	0.022	0.115	0.3	0.015	0.082	0.4	0.034	0.206
Others	4.4	0.104	0.395	3.3	0.130	0.516	3.3	0.191	0.746	2.9	0.258	0.922
Total	83.1	1.957	9.844	37.6	1.438	7.893	12.6	0.718	3.917	6.7	0.590	3.203
DBH Class	40-50			50-60			60+			Total		
Species	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/ha	V10/ha
Sundri	0.0	0.007	0.035	0.0	0.009	0.038	0.0	0.040	0.165	104.8	3.412	19.016
Gewa										18.1	0.477	2.268
Keora	0.5	0.085	0.778	0.2	0.043	0.368	0.2	0.097	0.523	2.6	0.327	2.429
Baen	0.1	0.017	0.109	0.1	0.025	0.159	0.4	0.217	1.214	2.4	0.345	1.953
Others	0.5	0.071	0.207	0.1	0.019	0.037	0.1	0.038	0.054	14.5	0.811	2.877
Total	1.2	0.180	1.128	0.4	0.096	0.602	0.8	0.393	1.956	142.4	5.372	28.543

Table 6: Differences in between 2009 and 1996 for trees Statistics in DBH (cm) Classes and Species (data 2009 - data 1996)

DBH Class	15-20			20-25			25-30			30-40		
Species	N/ha	BA/ha	V10/ha	N/ha	BA/h <sub>a</sub>	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/h <sub>a</sub>	V10/ha
Sundri	54.0	1.224	8.154	23.7	0.927	7.866	13.3	0.762	6.003	8.1	0.714	5.503
Gewa	35.6	0.796	3.670	5.7	0.207	1.033	1.6	0.089	0.459	0.6	0.055	0.292
Keora	-0.2	-0.006	-0.022	-0.2	-0.01	-0.030	0.1	0.004	0.024	-0.4	-0.04	-0.339
Baen	0.1	0.004	0.020	0.1	0.006	0.033	0.5	0.027	0.153	0.4	0.040	0.243
Others	3.1	0.067	0.253	2.8	0.109	0.432	1.4	0.085	0.330	1.3	0.135	0.460
Total	92.6	2.085	12.075	32.1	1.242	9.333	16.8	0.967	6.969	10.1	0.906	6.158
DBH Class	40-50			50-60			60+			Total		
Species	N/ha	BA/ha	V10/ha	N/ha	BA/h <sub>a</sub>	V10/ha	N/ha	BA/ha	V10/ha	N/ha	BA/h <sub>a</sub>	V10/ha
Sundri	1.1	0.157	1.168	0.3	0.058	0.447	0.1	-0.01	0.047	100.5	3.830	29.188
Gewa	0.1	0.022	0.118	0.0	0.000	0.000	0.0	0.000	0.000	43.7	1.170	5.572
Keora	-0.3	-0.043	-0.399	-0.1	-0.03	-0.286	-0.1	-0.06	-0.311	-1.2	-0.19	-1.363
Baen	0.4	0.058	0.362	0.3	0.060	0.376	0.4	0.438	1.933	2.2	0.633	3.119
Others	0.9	0.128	0.371	0.4	0.092	0.205	0.1	0.034	0.057	9.9	0.650	2.107
Total	2.2	0.321	1.620	0.8	0.176	0.743	0.5	0.397	1.725	155.1	6.095	38.623

Table 7: The Change for different statistics expressed in percentage (%) for Sundarban in 2009 from 1996

Species	Seedlings	Saplings	Pole 2.5-5	Pole 5-10	Poles 10-15			Tree		
	N/ha (%)	N/ha (%)	N/ha (%)	N/ha (%)	N/ha (%)	BA/ha (m <sup>2</sup> ) (%)	V10/ha (m <sup>3</sup> ) (%)	N/ha (%)	BA/ha (m <sup>2</sup> ) (%)	V10/ha (m <sup>3</sup> ) (%)
Sundri	41.05	-11.29	172.31	94.72	11.90	15.06	20.19	70.57	71.30	102.26
Gewa	20.92	-16.82	149.56	161.78	18.27	20.38	18.31	30.70	21.78	19.52
Baen	0.06	-0.07	-0.11	-0.11	-0.12	-0.02	0.00	-0.87	-3.50	-4.77
Keora	0.00	0.01	0.23	0.79	0.28	0.23	0.24	1.54	11.78	10.93
Others	-7.07	-3.26	74.42	28.02	1.74	1.88	1.53	6.97	12.09	7.38
Total	54.96	-31.43	396.23	285.19	32.08	37.53	40.28	108.92	113.46	135.31

Table 8: Volume of poles (DBH 10-15 cm) and Trees in Sundarban in 2009 & 1996

	Year 2009	Year 1996	Year 2009	Year 1996
Size class	Pole 10-15	Pole 10-15	Tree	Tree
Species	V10/ha (m <sup>3</sup> )	V10/ha (m <sup>3</sup> )	V10/ha (m <sup>3</sup> )	V10/ha (m <sup>3</sup> )
Sundri	13.922	10.397	48.204	19.016

Gewa	9.844	6.647	7.840	2.268
Others	0.723	0.414	11.121	7.259
Total	24.490	17.457	67.166	28.543

Figure 2: Volumes of big poles and trees in Sundarban in 2009 & 1996

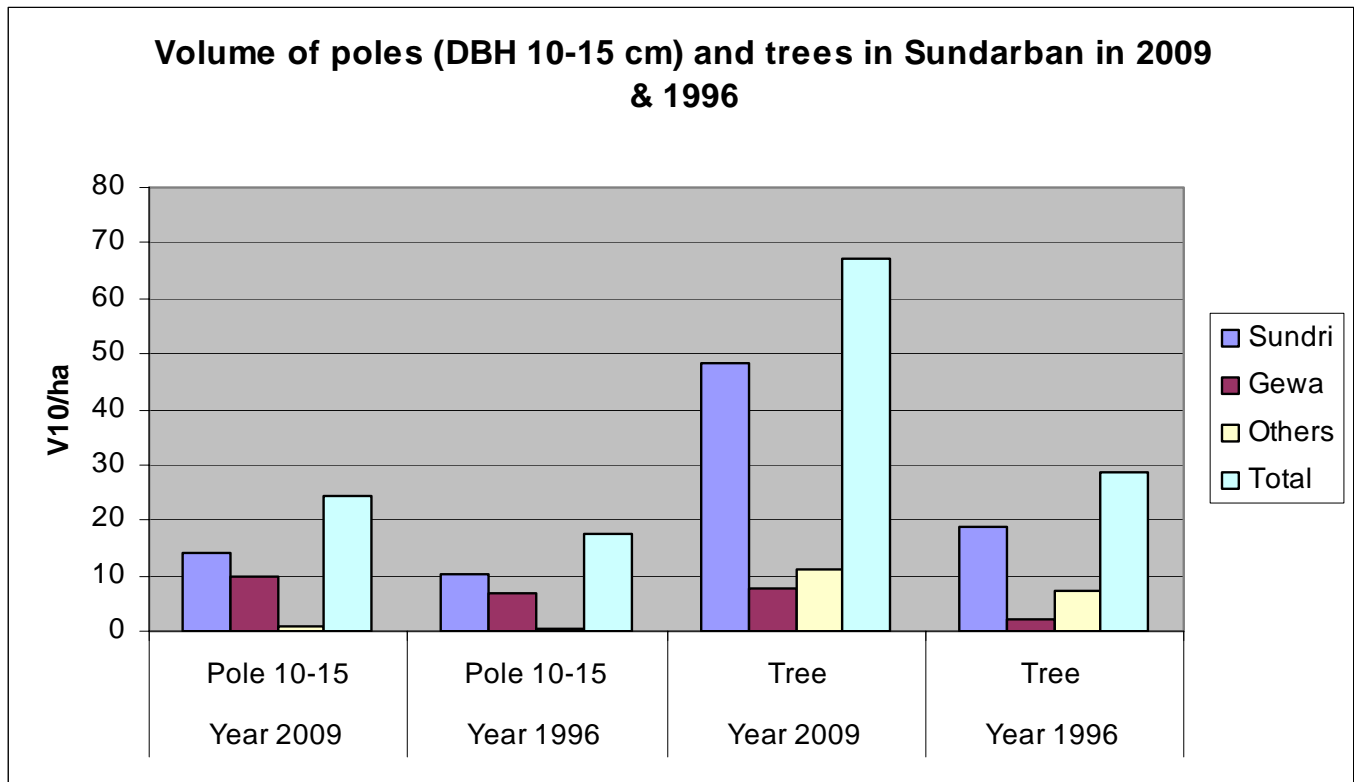


Table 9: DBH (cm) class distribution of different important species of Sundarbans in 2009 & 1996

	2009	1996	2009	1996	2009	1996
DBH Class	Sundri		Gewa		Others	
Saplings	3044	3957	<b>1266</b>	2627	1236.0	1503.0
Pole 2.5-5	2166	428	1983	476	853.0	102.2
Pole 5-10	1596	523	2393	560	375.1	176.4
<b>Pole 10-15</b>	<b>234</b>	<b>188</b>	<b>255</b>	<b>184</b>	18.1	10.7
15-20	117.4	63.4	50.0	14.4	8.3	5.4
20-25	54.0	30.4	8.8	3.0	7.0	4.2
25-30	1.2	8.4	0.1	0.6	0.3	3.6
30-40	10.6	2.6	0.7	0.1	5.4	4.1
40+	1.4	0.1	0.1	0.0	3.8	2.2
	4180.7	1243.8	4690.7	1238.1	1271.0	308.8

Figure 3: Diameter class distribution (N/ha) for sundri in the Sundarban in 2009 and 1996

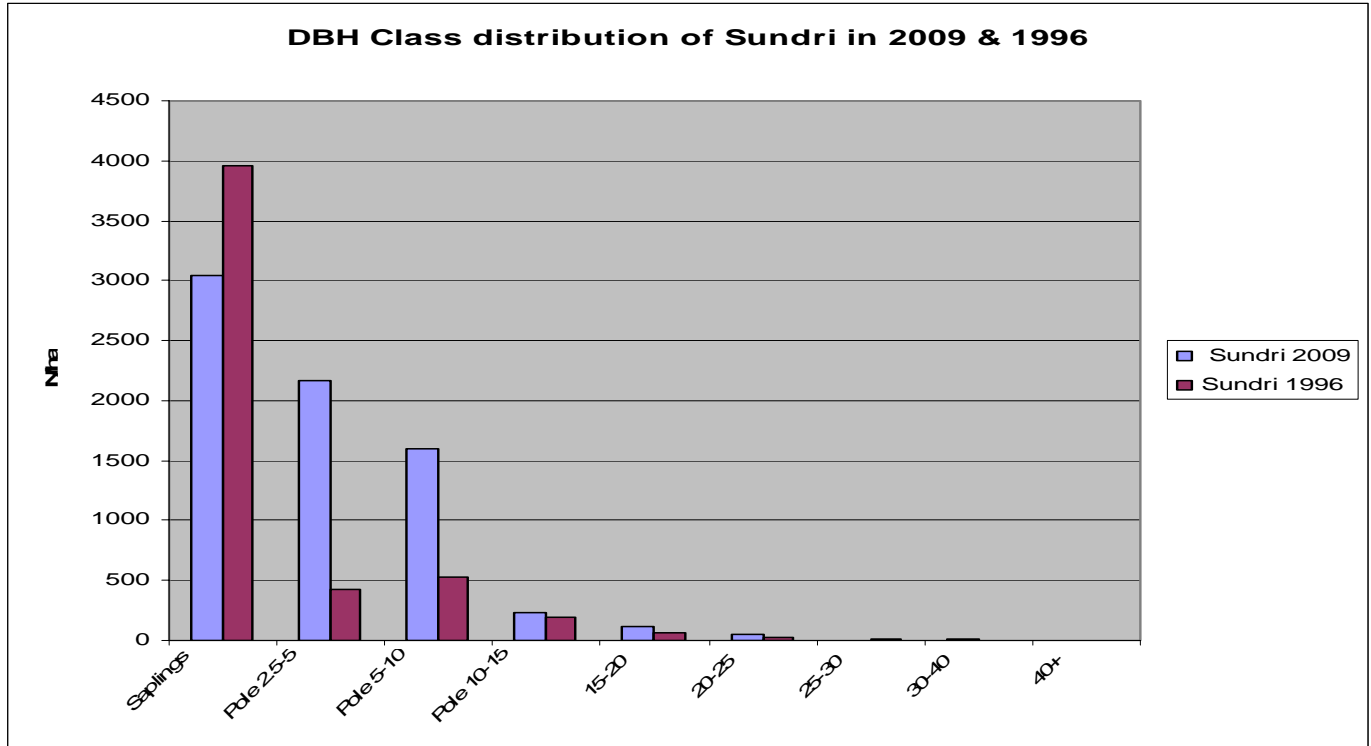


Figure 4: Diameter class distribution (N/ha) for gewa in the Sundarban in 2009 and 1996

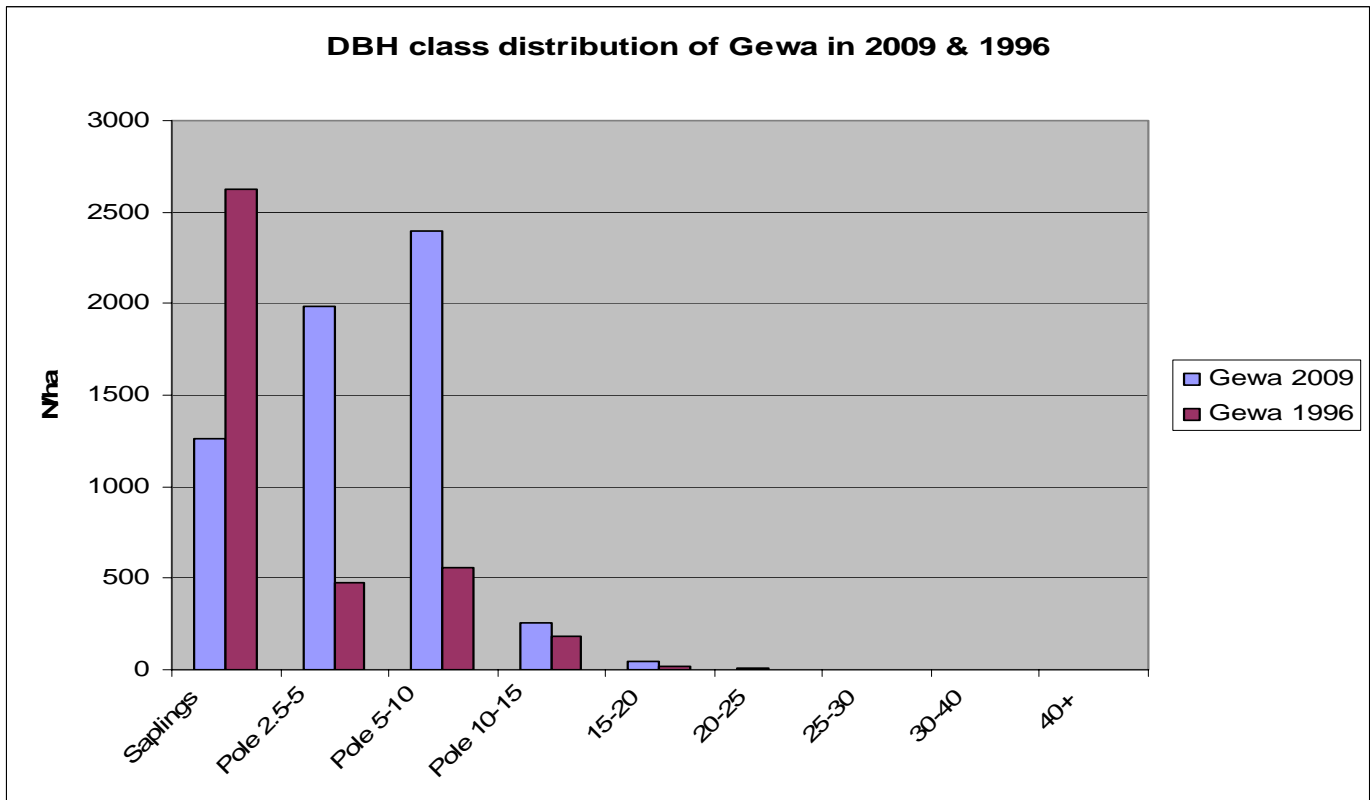
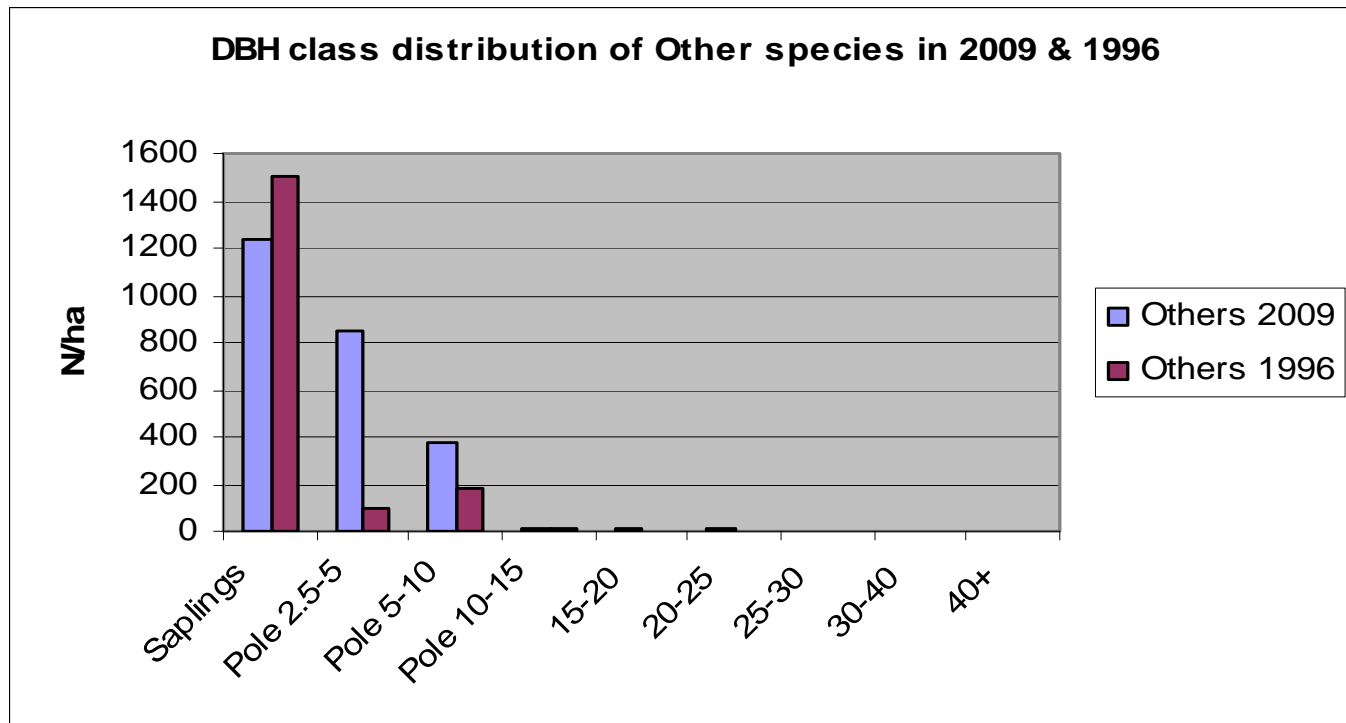




Figure 5: Diameter class distribution (N/ha) for other species in the Sundarban in 2009 and 1996



## 4. Goran Results

Goran is an important fuel wood species for the Sundarban. Therefore, an estimate for number of goran stems, volume and weight per hectare were estimated and the summary is given in Table 10. The detailed estimate for compartments is given in Table 28. The data collection procedures in 1996 and 2009-10 were not the same. The data were collected in 2009-10 as small stems, medium stems, large stems and x-large stems based on basal diameters classes as 0-0.6, 0.6-2.5, 2.5-7.6 and above 7.6 cm respectively. The data in 1996 were collected for seedlings (Height<1.5 m), saplings (DBH<2.5 cm) and poles/trees with DBH≥2.5 cm. The data were divided into two basal diameter classes' 0-2.5 cm and 2.5+ cm for comparison and conclusion. It is observed from the Table 10 that N/ha, Volume/ha and weight/ha have increased.

Table 10: Goran in different size classes (N/ha, Volume & Weight) in Sundarban in 2009 & 1996

	Size Class (Basal diameter in cm)	Small Stems	Medium Stems	Large Stems	X-large Stems		Total
		0-0.6	0.6-2.5	2.5-7.6	>7.6		
2009	N/ha	5853	9734	4270	471		4741
	Vol/ha	6.64	7.09	28.22	3.74		31.96
	Wt/ha (KG)	6482	8632	28260	3711		31971
	Size Class	Seedlings	Saplings	2.5 – 4.9	5 – 9.9	10 cm & +	Total 2.5 cm +

		Seedlings	Saplings	2.5-5	5-10	10+	
1996	N/ha	4719	2306	2497	186	22	2704
	Vol/ha		1.68	5.58	2.14	5.87	14
	Wt/ha (KG)		2045	6091	2082	5359	13532
Increment	N/ha						2036.14
	Vol/ha						18.37
	Wt/ha (KG)						18439.04

## 5. Species Composition of Sundarban

The species compositions of the SRF are dynamic. Therefore, an attempt was taken to estimate the present situation. The number of trees of sundri, gewa and others (keora, baen and others) were estimated and converted into percentages of the total (Table 11). The result shows that the percentage of sundri trees has reduced to about 4.58% followed by others. The percentage of gewa trees has increased by 8.08%. The result is also shown in Figure 6 & 7. The species compositions were also estimated including the poles with trees. It is also observed from the Table 11, that if the poles are included with trees then the species compositions are changed in a same way. Latif *et al* (1992) also reported from 13 years study that sundri is in the similar decreasing trend and gewa in increasing trend.

Table 11: Comparative species compositions in 2009 and 1996

	Composition with trees					Composition with trees and poles						
	2009	1996	2009	1996	Change	2009	1996	2009	1996	2009	1996	Change
Species	N/ha	N/ha	%	%	%	Poles	Poles	Tree+ Poles	Tree+ Poles	%	%	%
Sundri	205	105	69.00	73.58	-4.60	3996	1140	4201	1244	41.30	46.69	-5.39
Gewa	62	18	20.77	12.70	8.10	4631	1220	4693	1238	46.14	46.46	-0.32
Others	30	20	10.23	13.72	-3.60	1247	163	1277	183	12.56	6.85	5.71
Total	297	142	100	100	0	9874	2523	10172	2665	100	100	0

Figure 6: Change in species (Trees) composition in the Sundarban during the period 1996 to 2009

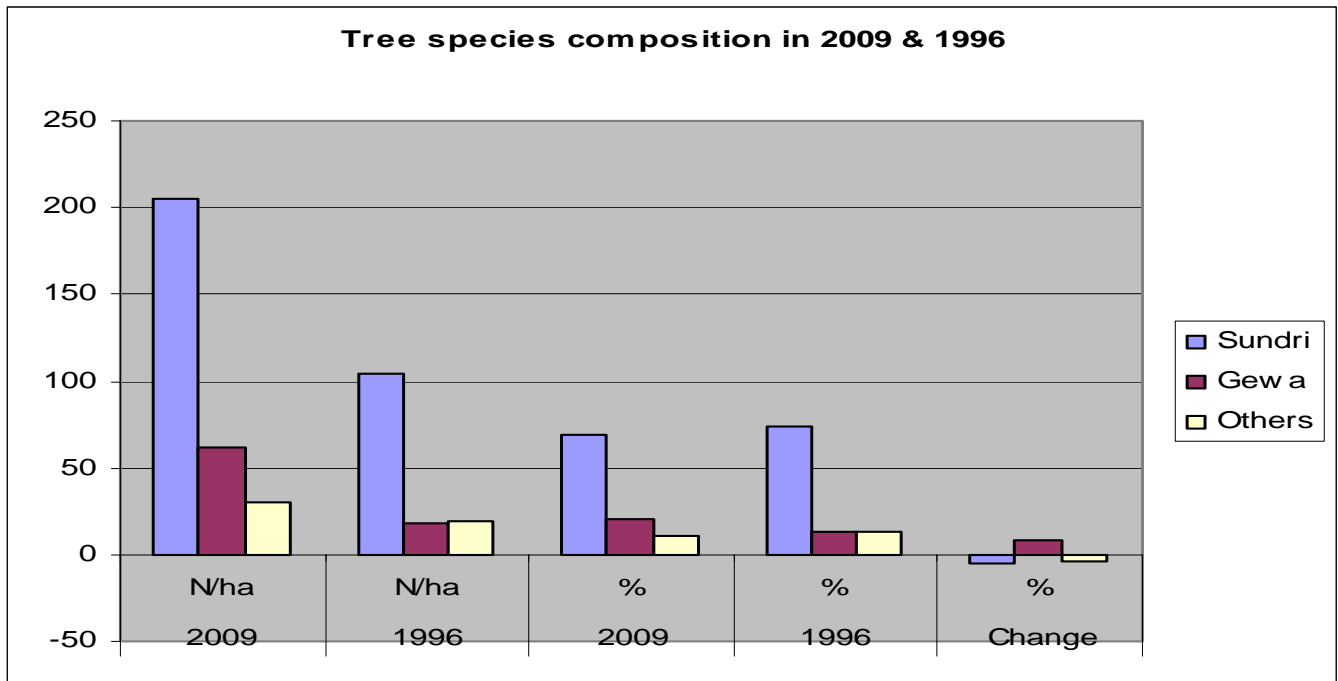
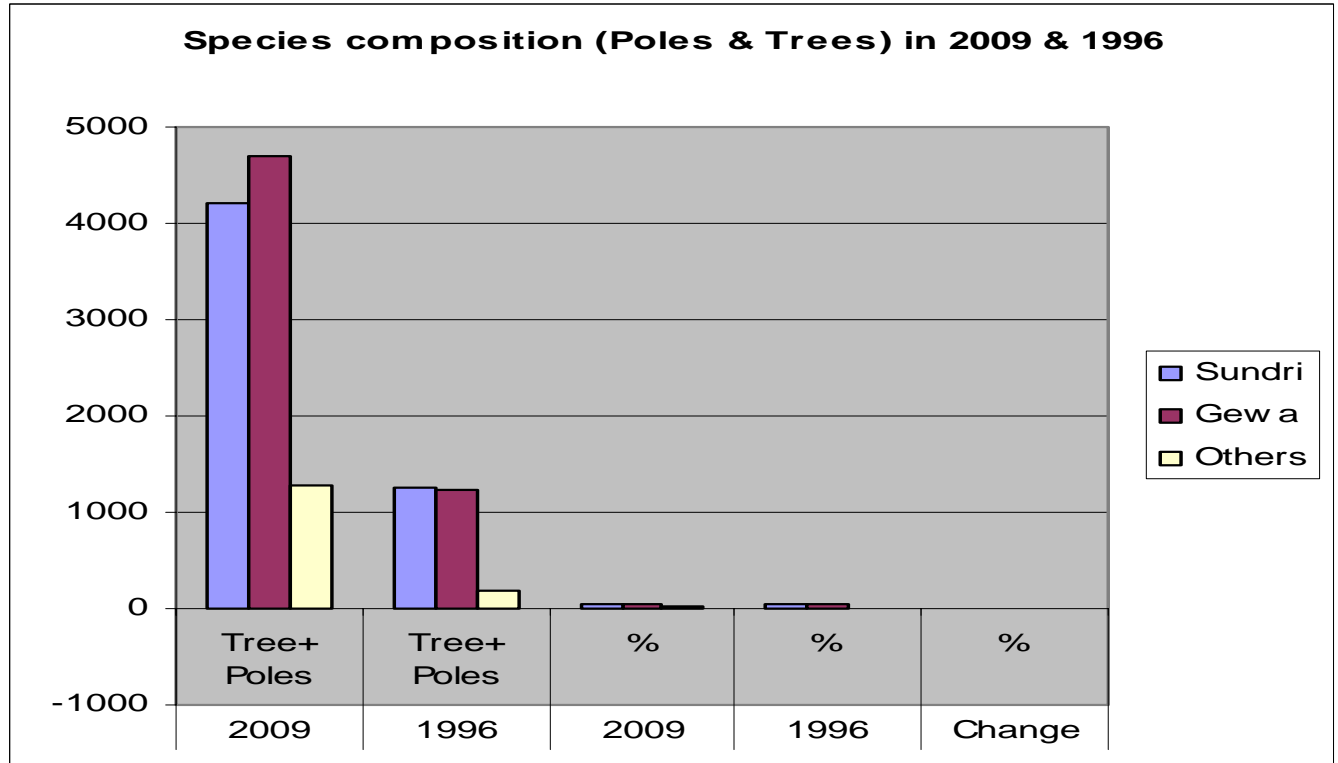


Figure 7: Change in species (Poles+ Trees) composition in the Sundarban during the period 1996 to 2009



## 6. Annual Allowable Cut (AAC)

The Annual Allowable Cut (AAC) for different species in the Sundarban Reserved Forest was estimated using the following formulae:

$$1. \text{ AAC} = (\text{Present standing mature volume} + \frac{1}{2} \text{ growth during the period}) / \text{Period of cutting cycle}$$

This formula was suggested by Professor M. M. Pant for the Sundarban. The estimated AAC is about three times for sundri & double for gewa of the prescribed value in the present working plan (WP) for the Sundarban (Table 12, column 7). The AAC is about similar for “others” species and about 1/7<sup>th</sup> for keora. But, if we consider different precautions given in the working plan, then the working plan volume is acceptable.

2. Austrian formula:

$$\text{AAC} = I + (G_a - G_r) / A$$

Where, I = Annual increment,

$G_a$  = Present Growing stock,

$G_r$  = desired growing stock (indicated by yield table or some other empirical standard)

A = an arbitrary adjust period, which may be a full rotation or any selected period

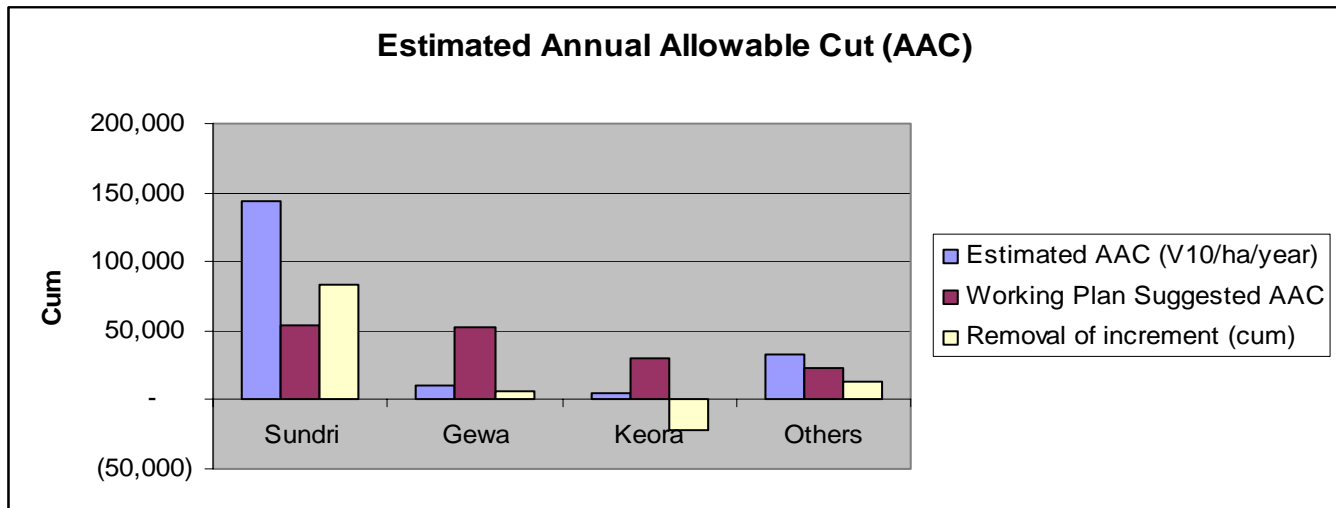
Here, if we consider  $G_a = G_r$ , then we can harvest only the increment and the AAC estimated following this assumption is given in Table 12 (column 9) and Figure 8. The figures for AAC are close to the working plan prescription except for keora.

Table 12: Annual Allowable Cut (AAC) for different species in the Sundarban RF

Species	Growing Stock (V10/ha)	Increment (V10/ha)	AAC (V10/ha/year)	DBH limit (cm)	Total area (ha)	Estimated AAC (V10/ha/year)	Working Plan Suggested AAC (cum)	Removal of increment (cum)
1	2	3	4	5	6	7	8	9
Sundri	8.815	7.165	0.620	30	231159	143285	54000	82808
Gewa	0.462	0.410	0.033	15	296698	9887	53000	6081

Keora	0.945	-1.335	0.014	25	319201	4424	29852	-21308
Baen	4.601	2.914	0.303			0		0
Others	2.313	1.092	0.143	25	231159	33041	23000	12626
Goran (Volume)	1.357	0.346	0.077	2.5				0
Goran (kg)	1458	402	82.96					0

Figure 8: Estimated Annual Allowable Cut (AAC) for different species in Sundarban



## 7. Comparison of the Result with Previous Inventories

An attempt was taken to compare the result of the previous inventories and the result is summarized in Table 13 & 14 and Figures 9, 10 & 11. The comparison shows that the number of stems and volume/ha had decreased after the Forestal inventory in 1959-61 and the condition is improving after ODA inventory in 1983.

Table 13: Comparative per hectare estimate of no. of trees and volumes of trees 15-cm DBH and bigger

Year	Species					
	Sundri		Gewa		Others	
	N/ha	V10/ha	N/ha	V10/ha	N/ha	V10/ha
2009	205	48.2	62	7.8	30.4	11.2
1996	106	17.8	20	2.1	20	7.5
1983	125	19.9	35	2.7	20	7.1
1959	211	33.6	61	5.0	24	5.9

Figure 9: Comparison of stems/ha with previous inventories of Sundarban

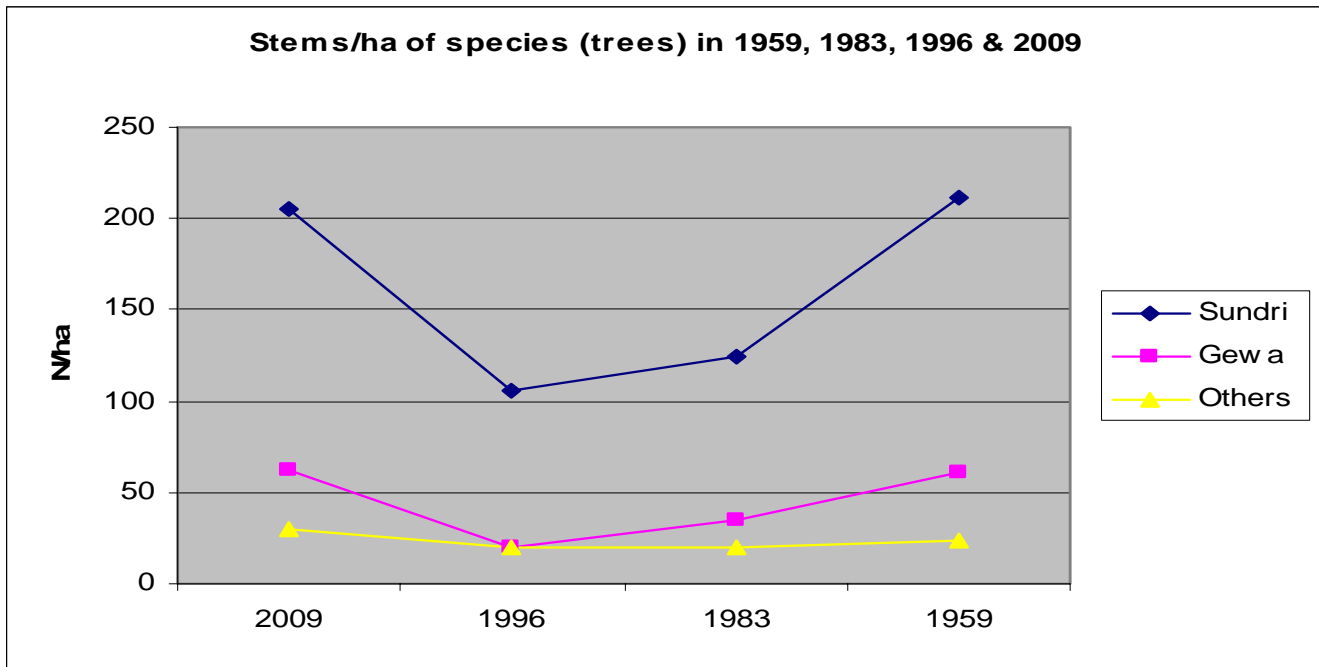


Figure 10: Comparison of V10/ha (cum) with previous inventories of Sundarban

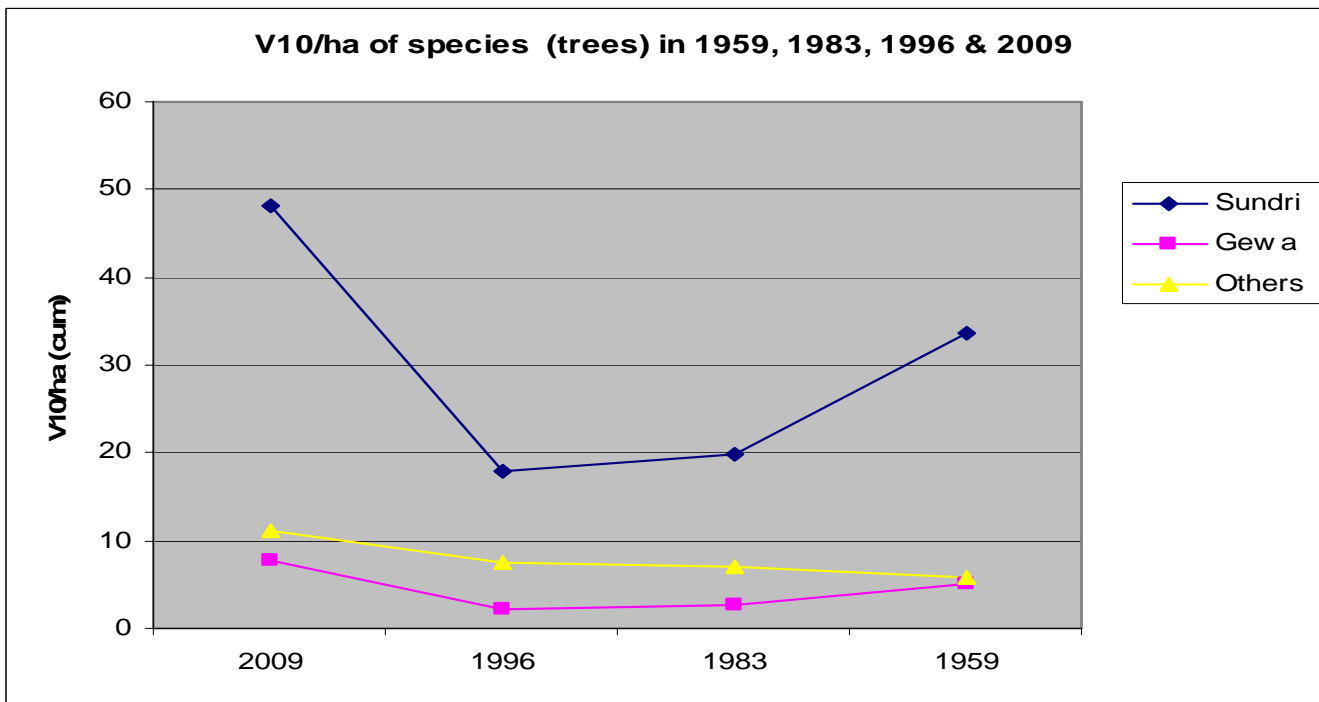
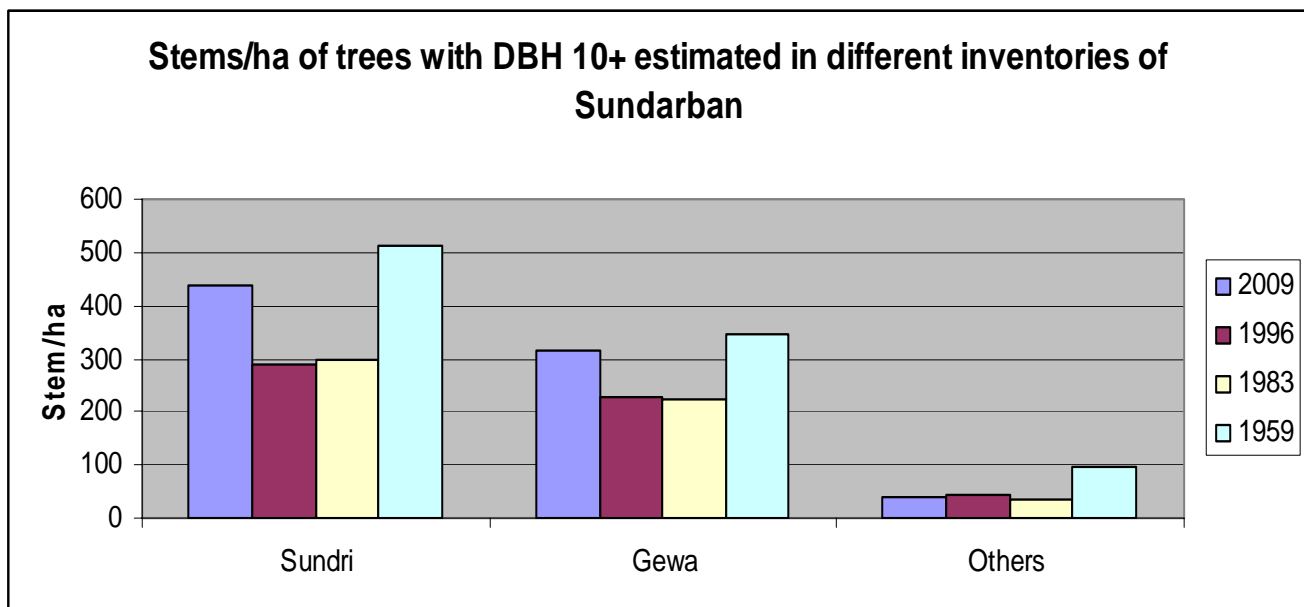


Table 14: Comparative per hectare estimate for number of stems of big pole & trees 10-cm DBH and bigger

Year	Species						Total
	Sundri		Gewa		Others		
	N/ha	%	N/ha	%	N/ha	%	
2009	439	55	317	40	41	5	797
1996	290	51.79	228	40.71	42	7.5	560
1983	296	53.14	224	40.22	37	6.64	557
1959	511	53.68	345	36.24	97	10.19	952

Figure 11: Estimate for number of stems/ha of big pole & trees 10-cm DBH and bigger



The whole of SRF has been divided into eight Blocks and 55 Compartments for its proper management. Therefore, the department needs some basic information for each Compartment. Hence, tables have been prepared to give estimates for number of trees per hectare (N/ha), basal area per hectare (BA/ha), volume per hectare (V10/ha) for trees and the change of these statistics since 1996 to 2009 (Table 13-17). Similarly, volume per hectare and number of stems per hectare in different DBH classes for the species sundri, gewa, keora, baen and others have also been prepared and presented in Tables 18-27. A table has been prepared for goran in different compartments and size classes (Table 28). An estimate for number of seedlings, saplings and poles has been given in Table 29. The distribution of volume estimates and number of stems for the poles of DBH class 10-15 cm have been given in Table 30-31. The Tables have been prepared following Working Plan written for SRF by Canonizado *et al* (1998).

## 8. References

- Canonizado, J. A. and Hossain, M. A. 1998. Integrated Forest Management Plan for the Sundarbans Reserved Forest. Mandala Agricultural Development Corporation and Forest Department, Ministry of Environment and Forests, Dhaka, Bangladesh, 276pp
- Revilla, J.A.V. 1996. Progress report for the second mission of the Forest Inventory Specialist, Mandala Agricultural Development Corporation, Dhaka Bangladesh, 150pp
- Donato, D. C., Kauffman, and Stidham, M. 2009. Protocols for measuring & reporting carbon stock in mangrove forest with special reference to carbon assessment for Sundarbans Reserved Forest, Bangladesh, USDA Forest Service, Funding support from USAID/Bangladesh, 77pp
- Latif, M. A., Rahman, M. F., Das, S. and Siddiqi. 1992. Diameter increments for six mangrove tree species in the Sundarbans Forest of Bangladesh. Bangladesh Journal of Forest Science. Vol. 21 (1 & 2): 7-12.
- Siddiqi, N. A. 1988. Seedling regeneration in relation to time and degree of salinity in the Sundarbans Mangrove Forest, Bano Biggyan Patrika, Vol 18, (1&2): 9-17.



# Annex I: List of Tables Prepared to Meet to Write IRMP for the SRF

Table 15: Tree Volumes V10 (m<sup>3</sup>) by compartment and species, 15 cm+ DBH in Sundarban in 2009

Block	Comp.	Baen	Gewa	Sundri	Others	Keora	Total
1	01	0.00	11.25	110.23	0.62	0.00	122.10
1	02	4.03	17.05	115.53	0.54	0.00	137.15
1	13	0.00	3.17	201.20	0.85	0.00	205.22
1	14	93.71	2.87	153.43	1.24	0.00	251.25
1	21	5.41	5.52	60.04	0.00	0.00	70.97
1	22	0.00	2.96	151.60	2.30	0.00	156.86
1	23	0.00	7.73	47.43	1.62	0.00	56.78
1	24	0.00	15.76	136.84	0.00	0.00	152.59
1	25	0.00	4.14	0.00	1.16	0.00	5.30
1	26	23.88	2.71	158.77	10.41	0.00	195.77
1	27	4.10	12.53	55.31	3.69	0.00	75.63
1	28	0.00	6.02	112.47	0.31	0.00	118.80
2	03	12.13	22.39	42.85	4.29	0.00	81.66
2	09	0.00	1.16	22.53	1.01	0.00	24.70
2	10	0.00	1.70	30.12	1.56	0.00	33.38
2	11	0.00	2.22	48.04	1.59	0.00	51.85
2	12A	0.00	43.45	293.29	0.00	0.00	336.74
2	12B	0.00	2.90	77.81	0.30	0.00	81.01
2	15	0.00	12.41	130.60	1.52	0.00	144.53
3	04	0.00	10.45	69.47	3.67	0.00	83.58
3	05	0.00	11.32	104.87	3.22	0.00	119.41
3	06	0.00	19.04	78.67	0.00	51.35	149.06
3	07	0.00	3.34	29.85	0.84	0.00	34.03
3	08	0.00	1.42	23.70	1.12	0.00	26.24
3	45	0.00	3.63	11.19	1.25	0.00	16.06
4	29	0.00	9.57	109.47	0.00	0.00	119.03
4	31	0.00	2.86	120.12	15.23	0.00	138.22
4	32	14.03	1.47	45.94	30.13	13.41	104.98
4	33	0.00	5.76	66.24	9.87	0.00	81.87
4	34	0.00	8.23	70.97	10.66	0.00	89.86
4	35	23.99	1.15	9.81	31.60	0.00	66.55
4	36	46.20	1.87	26.69	18.05	2.91	95.72
4	39	0.00	12.16	124.69	1.75	0.00	138.60
4	40	2.86	7.49	54.76	4.37	0.00	69.49
5A	46	0.00	1.24	0.00	10.08	0.00	11.32
5A	47	7.84	3.96	0.75	3.29	0.00	15.84
5B	16	19.18	13.06	86.08	2.16	0.00	120.49
5B	17	2.42	5.63	58.29	2.92	0.00	69.26
5B	20	30.82	3.58	27.01	4.87	4.97	71.25
5B	37	22.30	4.72	3.18	42.71	5.58	78.49
5B	38	17.96	1.81	15.83	10.49	0.00	46.09
5B	41	0.00	5.00	0.57	1.40	0.00	6.98
6	18	0.00	5.53	37.14	4.38	0.00	47.05

6	19	0.00	6.94	60.13	1.50	0.00	68.57
6	42	0.00	3.49	3.39	6.60	0.00	13.48
6	43	0.67	21.75	8.30	0.61	0.00	31.33
6	44	0.00	19.56	50.98	6.95	0.00	77.48
6	52	0.00	4.14	1.42	1.58	0.00	7.14
7	48	0.00	2.20	0.00	3.21	0.00	5.42
7	49	0.15	16.22	0.18	2.37	0.00	18.91
7	50B	10.46	27.42	0.00	3.00	0.00	40.89
7	51B	0.00	6.00	0.00	0.00	0.00	6.00
8	53	2.54	22.40	3.60	1.39	0.83	30.76
8	54	0.00	11.58	5.17	8.60	0.00	25.35
8	55	0.00	13.70	0.00	1.12	0.00	14.82

Table 16: Tree Number (N/ha) by compartment and species, 15 cm +DBH in Sundarban in 2009

Block	Comp.	Baen	Gewa	Sundri	Others	Keora	Total
1	01	0.00	71.62	449.61	3.98	0.00	525.21
1	02	2.12	82.76	519.91	2.12	0.00	606.91
1	13	0.00	28.29	647.23	3.54	0.00	679.06
1	14	12.73	25.46	502.93	6.37	0.00	547.49
1	21	7.07	49.51	268.80	0.00	0.00	325.38
1	22	0.00	24.76	442.10	10.61	0.00	477.46
1	23	0.00	84.88	212.21	10.61	0.00	307.70
1	24	0.00	143.24	557.04	0.00	0.00	700.28
1	25	0.00	25.46	0.00	6.37	0.00	31.83
1	26	19.89	27.85	668.45	35.81	0.00	752.01
1	27	17.68	74.27	198.06	31.83	0.00	321.85
1	28	0.00	39.79	441.65	3.98	0.00	485.42
2	03	3.98	194.96	214.86	27.85	0.00	441.65
2	09	0.00	12.51	126.19	5.68	0.00	144.38
2	10	0.00	19.10	155.97	3.18	0.00	178.25
2	11	0.00	17.68	261.72	5.31	0.00	284.71
2	12A	0.00	244.04	965.54	0.00	0.00	1209.58
2	12B	0.00	28.65	321.49	3.18	0.00	353.32
2	15	0.00	76.39	595.24	12.73	0.00	684.37
3	04	0.00	72.76	361.51	22.74	0.00	457.00
3	05	0.00	80.64	460.49	23.34	0.00	564.47
3	06	0.00	123.35	393.91	0.00	35.81	553.06
3	07	0.00	33.95	201.60	2.12	0.00	237.67
3	08	0.00	13.64	123.91	6.82	0.00	144.38
3	45	0.00	24.34	54.30	3.74	0.00	82.39
4	29	0.00	63.66	407.44	0.00	0.00	471.10
4	31	0.00	24.49	310.96	97.94	0.00	433.39
4	32	20.46	13.64	159.15	170.52	29.56	393.34
4	33	0.00	47.75	219.63	44.56	0.00	311.94
4	34	0.00	81.35	290.02	28.29	0.00	399.66
4	35	17.68	10.61	49.51	148.54	0.00	226.35
4	36	38.20	16.98	135.81	72.15	6.37	269.50
4	39	0.00	99.74	494.44	14.85	0.00	609.03
4	40	3.18	66.85	235.55	19.10	0.00	324.68
5A	46	0.00	12.13	0.00	53.05	0.00	65.18

5A	47	16.98	37.14	5.31	15.92	0.00	75.33
5B	16	8.38	72.04	361.87	11.73	0.00	454.01
5B	17	3.74	50.56	331.42	11.23	0.00	396.95
5B	20	35.37	35.37	145.01	17.68	7.07	240.50
5B	37	14.15	35.37	21.22	205.13	3.54	279.41
5B	38	19.10	14.85	99.74	40.32	0.00	174.01
5B	41	0.00	52.29	4.55	11.37	0.00	68.21
6	18	0.00	50.40	196.29	18.57	0.00	265.26
6	19	0.00	59.11	291.03	4.55	0.00	354.69
6	42	0.00	31.83	25.46	31.83	0.00	89.13
6	43	3.98	171.09	55.70	3.98	0.00	234.75
6	44	0.00	146.91	205.68	31.83	0.00	384.42
6	52	0.00	39.18	12.24	9.79	0.00	61.21
7	48	0.00	19.89	0.00	7.96	0.00	27.85
7	49	1.68	145.75	1.68	11.73	0.00	160.83
7	50B	3.98	254.65	0.00	15.92	0.00	274.54
7	51B	0.00	54.11	0.00	0.00	0.00	54.11
8	53	8.68	193.88	20.26	2.89	2.89	228.60
8	54	0.00	86.65	17.68	44.21	0.00	148.54
8	55	0.00	114.87	0.00	4.15	0.00	119.02

Table 17: Tree Basal Area (BA, m<sup>2</sup>) by compartment and species, 15 cm+ DBH in Sundarban in 2009

Block	Comp.	Baen	Gewa	Sundri	Others	Keora	Total
1	01	0.00	2.30	16.46	0.16	0.00	18.92
1	02	0.64	3.40	17.50	0.14	0.00	21.68
1	13	0.00	0.68	28.88	0.22	0.00	29.78
1	14	27.09	0.61	22.09	0.31	0.00	50.11
1	21	0.88	1.18	9.05	0.00	0.00	11.11
1	22	0.00	0.63	21.60	0.62	0.00	22.85
1	23	0.00	1.72	7.12	0.41	0.00	9.24
1	24	0.00	3.38	20.30	0.00	0.00	23.68
1	25	0.00	0.84	0.00	0.29	0.00	1.13
1	26	3.83	0.59	23.83	3.14	0.00	31.40
1	27	0.75	2.54	8.05	0.96	0.00	12.30
1	28	0.00	1.23	16.64	0.08	0.00	17.96
2	03	2.06	4.77	6.64	1.10	0.00	14.57
2	09	0.00	0.26	3.57	0.26	0.00	4.09
2	10	0.00	0.38	4.68	0.98	0.00	6.04
2	11	0.00	0.47	7.59	0.47	0.00	8.52
2	12A	0.00	8.78	42.56	0.00	0.00	51.34
2	12B	0.00	0.63	11.62	0.08	0.00	12.33
2	15	0.00	2.52	19.82	0.40	0.00	22.74
3	04	0.00	2.15	10.90	1.07	0.00	14.12
3	05	0.00	2.34	15.82	0.83	0.00	19.00
3	06	0.00	3.89	12.18	0.00	6.70	22.77
3	07	0.00	0.73	4.96	0.27	0.00	5.96
3	08	0.00	0.31	3.70	0.31	0.00	4.32
3	45	0.00	0.75	1.71	0.51	0.00	2.97
4	29	0.00	1.96	16.03	0.00	0.00	17.99
4	31	0.00	0.61	16.91	4.12	0.00	21.63

4	32	2.38	0.32	6.66	8.37	1.82	19.55
4	33	0.00	1.22	9.54	2.69	0.00	13.45
4	34	0.00	1.79	10.56	4.39	0.00	16.75
4	35	3.90	0.25	1.51	8.86	0.00	14.51
4	36	8.89	0.40	4.11	5.51	0.40	19.31
4	39	0.00	2.57	18.49	0.45	0.00	21.51
4	40	0.46	1.60	8.17	1.21	0.00	11.45
5A	46	0.00	0.27	0.00	2.65	0.00	2.92
5A	47	1.33	0.85	0.13	0.96	0.00	3.26
5B	16	3.83	2.64	12.91	0.55	0.00	19.92
5B	17	0.40	1.21	9.30	0.89	0.00	11.79
5B	20	5.15	0.78	4.22	1.59	0.58	12.32
5B	37	3.88	0.98	0.53	11.75	0.61	17.74
5B	38	3.26	0.38	2.58	3.09	0.00	9.31
5B	41	0.00	1.10	0.10	0.37	0.00	1.57
6	18	0.00	1.19	5.81	1.29	0.00	8.29
6	19	0.00	1.47	9.32	0.42	0.00	11.21
6	42	0.00	0.75	0.58	1.86	0.00	3.19
6	43	0.13	4.56	1.37	0.15	0.00	6.22
6	44	0.00	4.07	7.59	2.26	0.00	13.93
6	52	0.00	0.89	0.25	0.41	0.00	1.56
7	48	0.00	0.47	0.00	1.60	0.00	2.07
7	49	0.03	3.48	0.03	0.67	0.00	4.21
7	50B	1.73	5.91	0.00	0.85	0.00	8.49
7	51B	0.00	1.29	0.00	0.00	0.00	1.29
8	53	0.45	4.77	0.57	0.60	0.14	6.54
8	54	0.00	2.41	0.78	3.01	0.00	6.20
8	55	0.00	2.90	0.00	0.32	0.00	3.22

Table 18: Change in volume (m<sup>3</sup>) for trees in between 2009 and 1996 by compartment and species

Block	Comp.	Baen	Gewa	Sundri	Keora	Others	Total
1	01	0.00	7.25	64.31	0.00	-1.01	70.54
1	02	-9.27	14.06	67.42	-26.79	0.25	45.68
1	13	0.00	1.78	143.60	0.00	0.85	146.23
1	14	93.71	-1.17	82.11	0.00	-0.33	174.32
1	21	5.41	4.73	-1.67	0.00	-1.41	7.06
1	22	-2.18	2.96	84.30	0.00	-1.19	83.89
1	23	0.00	7.73	32.91	0.00	-3.66	36.97
1	24	0.00	14.03	86.37	0.00	0.00	100.40
1	25	-3.48	3.66	-17.19	0.00	-7.96	-24.98
1	26	23.88	-3.37	135.27	0.00	10.41	166.18
1	27	4.10	7.79	12.80	0.00	3.69	28.38
1	28	0.00	-1.95	87.41	0.00	-3.22	82.24
2	03	10.82	21.57	6.85	0.00	2.79	42.04
2	09	0.00	0.35	14.88	0.00	0.68	15.92
2	10	0.00	1.12	16.52	0.00	-0.81	16.84
2	11	0.00	1.74	23.59	0.00	0.92	26.25
2	12A	0.00	41.02	273.19	0.00	-0.71	313.50
2	12B	0.00	2.31	56.91	0.00	0.30	59.52
2	15	0.00	11.29	60.87	0.00	0.96	73.12

3	04	0.00	9.86	26.03	0.00	0.79	36.67
3	05	0.00	-0.02	70.29	0.00	0.82	71.09
3	06	0.00	12.80	52.65	-63.74	0.00	1.71
3	07	-1.76	1.81	22.07	0.00	0.84	22.96
3	08	0.00	0.42	6.84	-5.55	0.45	2.17
3	45	0.00	1.00	2.67	0.00	1.25	4.92
4	29	0.00	5.57	-2.27	0.00	0.00	3.30
4	31	-7.87	-6.34	68.32	0.00	12.87	66.98
4	32	5.01	1.07	34.18	13.41	9.32	62.97
4	33	0.00	4.03	14.60	0.00	0.33	18.96
4	34	0.00	6.50	51.19	0.00	10.66	68.35
4	35	20.56	0.60	-5.04	0.00	27.84	43.96
4	36	27.75	-0.46	0.44	2.91	-3.58	27.06
4	39	-0.75	9.78	85.27	0.00	0.15	94.45
4	40	-43.76	6.96	30.14	0.00	0.50	-6.15
5A	46	0.00	-0.63	-0.31	0.00	-5.62	-6.55
5A	47	5.93	2.35	0.62	-1.82	-2.40	4.67
5B	16	19.18	11.00	52.68	0.00	2.16	85.03
5B	17	2.42	3.32	35.18	0.00	1.42	42.35
5B	20	22.64	2.01	-4.46	-9.45	1.08	11.81
5B	37	22.30	-3.44	-16.64	5.58	22.40	30.20
5B	38	2.23	-0.81	-11.15	-7.36	1.55	-15.55
5B	41	0.00	4.43	-0.52	0.00	-2.02	1.89
6	18	0.00	4.92	15.66	0.00	3.98	24.56
6	19	0.00	6.43	20.34	0.00	0.92	27.69
6	42	0.00	3.49	-3.54	0.00	3.93	3.88
6	43	0.67	13.87	1.22	-10.33	0.61	6.04
6	44	0.00	11.20	39.94	-9.18	-1.12	40.84
6	52	0.00	1.85	1.42	0.00	-0.60	2.67
7	48	0.00	2.20	0.00	0.00	1.89	4.09
7	49	0.15	14.28	0.18	0.00	1.42	16.03
7	50B	10.46	15.95	0.00	0.00	-1.23	25.18
7	51B	0.00	4.39	0.00	0.00	-2.20	2.19
8	53	2.54	8.48	1.08	0.83	-4.90	8.03
8	54	0.00	10.46	5.17	0.00	7.31	22.94
8	55	0.00	11.43	0.00	0.00	1.12	12.55

Table 19: Change in number of trees in between 2009 and 1996 by compartment and species

Block	Comp.	Baen	Gewa	Sundri	Keora	Others	Total
1	01	0	32	209	0	-6	235
1	02	-6	62	278	-13	0	320
1	13	0	18	332	0	4	354
1	14	13	-13	185	0	0	185
1	21	7	42	-57	0	-7	-14
1	22	-4	25	106	0	-4	124
1	23	0	85	74	0	-32	127
1	24	0	127	302	0	0	430
1	25	-6	19	-146	0	-51	-185
1	26	20	-8	513	0	36	561
1	27	18	35	-60	0	32	25

1	28	0	0	294	0	-12	283
2	03	0	187	32	0	20	239
2	09	0	6	64	0	5	74
2	10	0	13	45	0	-10	48
2	11	0	14	115	0	0	129
2	12A	0	223	806	0	-11	1019
2	12B	0	25	169	0	3	197
2	15	0	67	188	0	10	264
3	04	0	68	102	0	5	175
3	05	0	-15	267	0	8	261
3	06	0	88	271	-123	0	271
3	07	-4	23	144	0	2	166
3	08	0	5	6	-3	5	11
3	45	0	6	2	0	4	11
4	29	0	45	25	0	0	70
4	31	-15	-24	157	0	73	191
4	32	-27	9	89	0	43	143
4	33	0	29	13	0	0	41
4	34	0	64	120	0	28	212
4	35	-4	4	-14	0	131	117
4	36	25	-2	-13	0	-21	-4
4	39	-4	79	214	0	6	295
4	40	-16	64	35	0	0	83
5A	46	0	0	-3	0	-27	-30
5A	47	13	22	4	-1	-8	30
5B	16	8	50	147	0	12	218
5B	17	4	32	174	0	6	215
5B	20	28	25	-28	-14	0	18
5B	37	14	-32	-92	0	117	11
5B	38	13	-4	-76	-17	8	-76
5B	41	0	45	-5	0	-7	34
6	18	0	44	80	0	17	141
6	19	0	55	32	0	2	89
6	42	0	32	-25	0	19	25
6	43	4	121	8	-14	4	123
6	44	0	76	140	-20	-2	193
6	52	0	17	12	0	5	34
7	48	0	20	0	0	-4	16
7	49	2	127	2	0	5	136
7	50B	4	151	0	0	-8	147
7	51B	0	38	0	0	-16	22
8	53	9	84	-12	0	-32	52
8	54	0	76	18	0	32	126
8	55	0	91	0	0	4	95

Table 20: Tree Volume (m<sup>3</sup>) for sundri by compartment and DBH class, 15 cm+ DBH in in 2009

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	01	31.78	35.08	18.39	20.46	4.53	0.00	0.00	110.23
1	02	43.83	28.10	30.77	12.82	0.00	0.00	0.00	115.53

1	13	30.66	64.95	33.72	59.93	11.95	0.00	0.00	201.20
1	14	26.62	48.53	28.56	43.67	6.05	0.00	0.00	153.43
1	21	21.71	22.91	6.11	9.31	0.00	0.00	0.00	60.04
1	22	24.53	35.59	29.41	47.85	3.78	10.45	0.00	151.60
1	23	15.09	16.53	9.77	6.04	0.00	0.00	0.00	47.43
1	24	37.14	56.45	23.58	19.67	0.00	0.00	0.00	136.84
1	26	51.29	42.68	51.07	9.57	4.18	0.00	0.00	158.77
1	27	11.27	23.26	7.17	10.16	3.44	0.00	0.00	55.31
1	28	30.44	37.76	30.91	13.36	0.00	0.00	0.00	112.47
2	03	18.12	12.21	9.73	2.79	0.00	0.00	0.00	42.85
2	09	12.22	6.25	2.71	1.34	0.00	0.00	0.00	22.53
2	10	14.08	10.52	3.12	2.40	0.00	0.00	0.00	30.12
2	11	24.46	13.10	4.21	6.27	0.00	0.00	0.00	48.04
2	12A	59.36	70.86	72.65	67.09	0.00	0.00	23.33	293.29
2	12B	23.92	24.27	14.29	11.11	4.22	0.00	0.00	77.81
2	15	47.82	42.70	27.81	12.27	0.00	0.00	0.00	130.60
3	04	38.42	17.69	3.36	3.88	2.72	3.40	0.00	69.47
3	05	37.15	29.31	21.25	17.15	0.00	0.00	0.00	104.87
3	06	35.59	29.56	6.21	2.97	4.35	0.00	0.00	78.67
3	07	22.60	5.63	1.62	0.00	0.00	0.00	0.00	29.85
3	08	11.57	8.82	2.66	0.65	0.00	0.00	0.00	23.70
3	45	4.11	4.11	1.71	1.26	0.00	0.00	0.00	11.19
4	29	24.72	33.71	28.12	15.95	6.96	0.00	0.00	109.47
4	31	12.64	20.03	30.66	41.88	11.29	3.62	0.00	120.12
4	32	9.44	10.12	17.26	6.96	2.16	0.00	0.00	45.94
4	33	9.67	20.04	25.21	11.32	0.00	0.00	0.00	66.24
4	34	20.65	24.69	11.50	14.11	0.00	0.00	0.00	70.97
4	35	3.34	6.47	0.00	0.00	0.00	0.00	0.00	9.81
4	36	11.38	15.31	0.00	0.00	0.00	0.00	0.00	26.69
4	39	32.90	37.67	32.08	15.94	2.48	3.61	0.00	124.69
4	40	14.94	30.78	7.35	1.70	0.00	0.00	0.00	54.76
5A	47	0.48	0.27	0.00	0.00	0.00	0.00	0.00	0.75
5B	16	26.74	27.25	14.23	13.20	2.00	2.67	0.00	86.08
5B	17	34.73	14.62	5.82	1.16	1.96	0.00	0.00	58.29
5B	20	11.98	11.88	1.23	1.93	0.00	0.00	0.00	27.01
5B	37	2.30	0.88	0.00	0.00	0.00	0.00	0.00	3.18
5B	38	9.81	5.24	0.78	0.00	0.00	0.00	0.00	15.83
5B	41	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.57
6	18	19.54	8.19	6.02	3.38	0.00	0.00	0.00	37.14
6	19	29.34	18.46	4.67	0.00	2.11	0.00	5.55	60.13
6	42	3.39	0.00	0.00	0.00	0.00	0.00	0.00	3.39
6	43	5.60	1.79	0.92	0.00	0.00	0.00	0.00	8.30
6	44	15.62	17.55	6.06	6.48	5.26	0.00	0.00	50.98
6	52	1.42	0.00	0.00	0.00	0.00	0.00	0.00	1.42
7	49	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.18
8	53	2.20	1.40	0.00	0.00	0.00	0.00	0.00	3.60
8	54	1.37	0.00	1.25	0.00	0.00	2.54	0.00	5.17

Table 21: Tree number for sundri by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009

		DBH class (cm)		
--	--	----------------	--	--

Block	Comp.	15-20	20-25	25-30	30-40	40-50	50-60	60+	Total
1	01	236.74	133.29	45.76	29.84	3.98	0.00	0.00	449.61
1	02	322.55	106.10	72.15	19.10	0.00	0.00	0.00	519.91
1	13	226.35	244.04	77.81	88.42	10.61	0.00	0.00	647.23
1	14	190.99	171.89	70.03	63.66	6.37	0.00	0.00	502.93
1	21	159.15	81.35	14.15	14.15	0.00	0.00	0.00	268.80
1	22	162.69	127.32	67.20	74.27	3.54	7.07	0.00	442.10
1	23	116.71	63.66	21.22	10.61	0.00	0.00	0.00	212.21
1	24	262.61	206.90	55.70	31.83	0.00	0.00	0.00	557.04
1	26	370.04	151.20	127.32	15.92	3.98	0.00	0.00	668.45
1	27	81.35	81.35	17.68	14.15	3.54	0.00	0.00	198.06
1	28	206.90	135.28	79.58	19.89	0.00	0.00	0.00	441.65
2	03	139.26	47.75	23.87	3.98	0.00	0.00	0.00	214.86
2	09	92.08	25.01	6.82	2.27	0.00	0.00	0.00	126.19
2	10	105.04	41.38	6.37	3.18	0.00	0.00	0.00	155.97
2	11	190.99	51.28	10.61	8.84	0.00	0.00	0.00	261.72
2	12A	413.80	254.65	180.38	106.10	0.00	0.00	10.61	965.54
2	12B	171.89	89.13	38.20	19.10	3.18	0.00	0.00	321.49
2	15	343.77	159.15	70.03	22.28	0.00	0.00	0.00	595.24
3	04	272.84	68.21	9.09	6.82	2.27	2.27	0.00	361.51
3	05	271.62	110.35	53.05	25.46	0.00	0.00	0.00	460.49
3	06	254.65	115.39	15.92	3.98	3.98	0.00	0.00	393.91
3	07	174.01	23.34	4.24	0.00	0.00	0.00	0.00	201.60
3	08	80.71	35.24	6.82	1.14	0.00	0.00	0.00	123.91
3	45	31.83	16.85	3.74	1.87	0.00	0.00	0.00	54.30
4	29	190.99	114.59	70.03	25.46	6.37	0.00	0.00	407.44
4	31	90.60	73.46	71.01	63.66	9.79	2.45	0.00	310.96
4	32	65.94	38.65	40.93	11.37	2.27	0.00	0.00	159.15
4	33	66.85	76.39	60.48	15.92	0.00	0.00	0.00	219.63
4	34	152.08	88.42	28.29	21.22	0.00	0.00	0.00	290.02
4	35	24.76	24.76	0.00	0.00	0.00	0.00	0.00	49.51
4	36	80.64	55.17	0.00	0.00	0.00	0.00	0.00	135.81
4	39	248.28	137.93	78.52	25.46	2.12	2.12	0.00	494.44
4	40	98.68	114.59	19.10	3.18	0.00	0.00	0.00	235.55
5A	47	4.24	1.06	0.00	0.00	0.00	0.00	0.00	5.31
5B	16	197.69	102.19	36.86	21.78	1.68	1.68	0.00	361.87
5B	17	256.52	58.04	13.11	1.87	1.87	0.00	0.00	331.42
5B	20	95.49	42.44	3.54	3.54	0.00	0.00	0.00	145.01
5B	37	17.68	3.54	0.00	0.00	0.00	0.00	0.00	21.22
5B	38	76.39	21.22	2.12	0.00	0.00	0.00	0.00	99.74
5B	41	4.55	0.00	0.00	0.00	0.00	0.00	0.00	4.55
6	18	147.22	29.18	14.59	5.31	0.00	0.00	0.00	196.29
6	19	206.90	68.21	11.37	0.00	2.27	0.00	2.27	291.03
6	42	25.46	0.00	0.00	0.00	0.00	0.00	0.00	25.46
6	43	45.76	7.96	1.99	0.00	0.00	0.00	0.00	55.70
6	44	110.18	66.11	14.69	9.79	4.90	0.00	0.00	205.68
6	52	12.24	0.00	0.00	0.00	0.00	0.00	0.00	12.24
7	49	1.68	0.00	0.00	0.00	0.00	0.00	0.00	1.68
8	53	14.47	5.79	0.00	0.00	0.00	0.00	0.00	20.26
8	54	12.38	0.00	3.54	0.00	0.00	1.77	0.00	17.68



Table 22: Tree Volume (m<sup>3</sup>) for Gewa by compartment and DBH class in Sundarban in 2009

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	01	5.21	2.31	1.68	2.06	0.00	0.00	0.00	11.25
1	02	3.96	3.90	4.47	2.82	1.90	0.00	0.00	17.05
1	13	2.48	0.69	0.00	0.00	0.00	0.00	0.00	3.17
1	14	2.87	0.00	0.00	0.00	0.00	0.00	0.00	2.87
1	21	4.23	1.29	0.00	0.00	0.00	0.00	0.00	5.52
1	22	2.35	0.61	0.00	0.00	0.00	0.00	0.00	2.96
1	23	7.73	0.00	0.00	0.00	0.00	0.00	0.00	7.73
1	24	13.02	2.74	0.00	0.00	0.00	0.00	0.00	15.76
1	25	0.96	3.18	0.00	0.00	0.00	0.00	0.00	4.14
1	26	2.71	0.00	0.00	0.00	0.00	0.00	0.00	2.71
1	27	5.45	2.53	0.97	3.59	0.00	0.00	0.00	12.53
1	28	3.07	1.40	0.00	1.55	0.00	0.00	0.00	6.02
2	03	17.56	3.55	1.28	0.00	0.00	0.00	0.00	22.39
2	09	1.16	0.00	0.00	0.00	0.00	0.00	0.00	1.16
2	10	1.70	0.00	0.00	0.00	0.00	0.00	0.00	1.70
2	11	1.68	0.00	0.54	0.00	0.00	0.00	0.00	2.22
2	12A	16.32	5.91	6.35	14.87	0.00	0.00	0.00	43.45
2	12B	2.39	0.51	0.00	0.00	0.00	0.00	0.00	2.90
2	15	3.84	5.65	2.92	0.00	0.00	0.00	0.00	12.41
3	04	6.13	2.86	0.57	0.88	0.00	0.00	0.00	10.45
3	05	6.03	2.39	2.90	0.00	0.00	0.00	0.00	11.32
3	06	9.45	5.68	2.18	1.73	0.00	0.00	0.00	19.04
3	07	3.34	0.00	0.00	0.00	0.00	0.00	0.00	3.34
3	08	1.42	0.00	0.00	0.00	0.00	0.00	0.00	1.42
3	45	2.02	0.36	0.00	0.00	1.25	0.00	0.00	3.63
4	29	4.61	1.56	3.40	0.00	0.00	0.00	0.00	9.57
4	31	2.42	0.44	0.00	0.00	0.00	0.00	0.00	2.86
4	32	1.10	0.37	0.00	0.00	0.00	0.00	0.00	1.47
4	33	4.59	1.17	0.00	0.00	0.00	0.00	0.00	5.76
4	34	7.48	0.76	0.00	0.00	0.00	0.00	0.00	8.23
4	35	1.15	0.00	0.00	0.00	0.00	0.00	0.00	1.15
4	36	1.39	0.48	0.00	0.00	0.00	0.00	0.00	1.87
4	39	8.56	3.05	0.56	0.00	0.00	0.00	0.00	12.16
4	40	5.81	1.69	0.00	0.00	0.00	0.00	0.00	7.49
5A	46	1.24	0.00	0.00	0.00	0.00	0.00	0.00	1.24
5A	47	3.60	0.36	0.00	0.00	0.00	0.00	0.00	3.96
5B	16	5.04	2.24	1.44	2.62	1.72	0.00	0.00	13.06
5B	17	4.66	0.97	0.00	0.00	0.00	0.00	0.00	5.63
5B	20	3.00	0.58	0.00	0.00	0.00	0.00	0.00	3.58
5B	37	2.84	1.88	0.00	0.00	0.00	0.00	0.00	4.72
5B	38	1.35	0.46	0.00	0.00	0.00	0.00	0.00	1.81
5B	41	5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
6	18	3.86	1.66	0.00	0.00	0.00	0.00	0.00	5.53
6	19	5.35	1.59	0.00	0.00	0.00	0.00	0.00	6.94
6	42	2.51	0.98	0.00	0.00	0.00	0.00	0.00	3.49
6	43	15.44	3.49	2.82	0.00	0.00	0.00	0.00	21.75
6	44	11.98	5.00	2.58	0.00	0.00	0.00	0.00	19.56
6	52	3.31	0.83	0.00	0.00	0.00	0.00	0.00	4.14

7	48	1.46	0.74	0.00	0.00	0.00	0.00	0.00	2.20
7	49	12.02	3.73	0.47	0.00	0.00	0.00	0.00	16.22
7	50B	21.12	6.31	0.00	0.00	0.00	0.00	0.00	27.42
7	51B	4.45	1.55	0.00	0.00	0.00	0.00	0.00	6.00
8	53	16.70	4.77	0.94	0.00	0.00	0.00	0.00	22.40
8	54	6.74	3.37	1.47	0.00	0.00	0.00	0.00	11.58
8	55	10.51	2.36	0.82	0.00	0.00	0.00	0.00	13.70

Table 23: Tree number for gewa by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	01	49.74	11.94	5.97	3.98	0.00	0.00	0.00	71.62
1	02	40.32	19.10	14.85	6.37	2.12	0.00	0.00	82.76
1	13	24.76	3.54	0.00	0.00	0.00	0.00	0.00	28.29
1	14	25.46	0.00	0.00	0.00	0.00	0.00	0.00	25.46
1	21	42.44	7.07	0.00	0.00	0.00	0.00	0.00	49.51
1	22	21.22	3.54	0.00	0.00	0.00	0.00	0.00	24.76
1	23	84.88	0.00	0.00	0.00	0.00	0.00	0.00	84.88
1	24	127.32	15.92	0.00	0.00	0.00	0.00	0.00	143.24
1	25	6.37	19.10	0.00	0.00	0.00	0.00	0.00	25.46
1	26	27.85	0.00	0.00	0.00	0.00	0.00	0.00	27.85
1	27	49.51	14.15	3.54	7.07	0.00	0.00	0.00	74.27
1	28	27.85	7.96	0.00	3.98	0.00	0.00	0.00	39.79
2	03	171.09	19.89	3.98	0.00	0.00	0.00	0.00	194.96
2	09	12.51	0.00	0.00	0.00	0.00	0.00	0.00	12.51
2	10	19.10	0.00	0.00	0.00	0.00	0.00	0.00	19.10
2	11	15.92	0.00	1.77	0.00	0.00	0.00	0.00	17.68
2	12A	159.15	31.83	21.22	31.83	0.00	0.00	0.00	244.04
2	12B	25.46	3.18	0.00	0.00	0.00	0.00	0.00	28.65
2	15	35.01	31.83	9.55	0.00	0.00	0.00	0.00	76.39
3	04	52.29	15.92	2.27	2.27	0.00	0.00	0.00	72.76
3	05	57.30	12.73	10.61	0.00	0.00	0.00	0.00	80.64
3	06	79.58	31.83	7.96	3.98	0.00	0.00	0.00	123.35
3	07	33.95	0.00	0.00	0.00	0.00	0.00	0.00	33.95
3	08	13.64	0.00	0.00	0.00	0.00	0.00	0.00	13.64
3	45	20.60	1.87	0.00	0.00	1.87	0.00	0.00	24.34
4	29	44.56	6.37	12.73	0.00	0.00	0.00	0.00	63.66
4	31	22.04	2.45	0.00	0.00	0.00	0.00	0.00	24.49
4	32	11.37	2.27	0.00	0.00	0.00	0.00	0.00	13.64
4	33	41.38	6.37	0.00	0.00	0.00	0.00	0.00	47.75
4	34	77.81	3.54	0.00	0.00	0.00	0.00	0.00	81.35
4	35	10.61	0.00	0.00	0.00	0.00	0.00	0.00	10.61
4	36	14.85	2.12	0.00	0.00	0.00	0.00	0.00	16.98
4	39	80.64	16.98	2.12	0.00	0.00	0.00	0.00	99.74
4	40	57.30	9.55	0.00	0.00	0.00	0.00	0.00	66.85
5A	46	12.13	0.00	0.00	0.00	0.00	0.00	0.00	12.13
5A	47	35.01	2.12	0.00	0.00	0.00	0.00	0.00	37.14
5B	16	48.58	11.73	5.03	5.03	1.68	0.00	0.00	72.04
5B	17	44.94	5.62	0.00	0.00	0.00	0.00	0.00	50.56
5B	20	31.83	3.54	0.00	0.00	0.00	0.00	0.00	35.37

5B	37	24.76	10.61	0.00	0.00	0.00	0.00	0.00	35.37
5B	38	12.73	2.12	0.00	0.00	0.00	0.00	0.00	14.85
5B	41	52.29	0.00	0.00	0.00	0.00	0.00	0.00	52.29
6	18	41.12	9.28	0.00	0.00	0.00	0.00	0.00	50.40
6	19	50.02	9.09	0.00	0.00	0.00	0.00	0.00	59.11
6	42	25.46	6.37	0.00	0.00	0.00	0.00	0.00	31.83
6	43	141.25	19.89	9.95	0.00	0.00	0.00	0.00	171.09
6	44	110.18	26.93	9.79	0.00	0.00	0.00	0.00	146.91
6	52	34.28	4.90	0.00	0.00	0.00	0.00	0.00	39.18
7	48	15.92	3.98	0.00	0.00	0.00	0.00	0.00	19.89
7	49	123.97	20.10	1.68	0.00	0.00	0.00	0.00	145.75
7	50B	218.84	35.81	0.00	0.00	0.00	0.00	0.00	254.65
7	51B	44.56	9.55	0.00	0.00	0.00	0.00	0.00	54.11
8	53	167.84	23.15	2.89	0.00	0.00	0.00	0.00	193.88
8	54	63.66	17.68	5.31	0.00	0.00	0.00	0.00	86.65
8	55	99.64	12.46	2.77	0.00	0.00	0.00	0.00	114.87

Table 24: Tree Volume (m<sup>3</sup>) for keora species by compartment and DBH class

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
3	06	0.88	1.50	2.76	13.78	4.55	0.00	0.00	23.47
4	32	0.00	0.46	0.92	1.73	0.00	0.00	0.00	3.12
4	36	0.10	0.00	0.00	0.00	2.88	0.00	0.00	2.98
5B	20	0.00	0.00	0.00	0.00	5.58	0.00	0.00	5.58
5B	37	0.00	1.01	0.00	0.00	0.00	0.00	0.00	1.01
8	53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 25: Tree number for keora species by compartment and DBH class, 15 cm+ DBH

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
3	06	0.00	0.00	3.98	7.96	11.94	3.98	7.96	35.81
4	32	6.82	4.55	4.55	11.37	2.27	0.00	0.00	29.56
4	36	0.00	2.12	2.12	2.12	0.00	0.00	0.00	6.37
5B	20	3.54	0.00	0.00	0.00	3.54	0.00	0.00	7.07
5B	37	0.00	0.00	0.00	0.00	3.54	0.00	0.00	3.54
8	53	0.00	2.89	0.00	0.00	0.00	0.00	0.00	2.89

Table 26: Tree Volume (m<sup>3</sup>) for baen by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	02	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.64
1	14	0.00	0.00	0.00	0.00	0.00	0.00	27.09	27.09
1	21	0.00	0.00	0.00	0.42	0.46	0.00	0.00	0.88
1	26	0.00	0.00	0.23	0.00	0.61	1.76	1.23	3.83

1	27	0.15	0.14	0.21	0.25	0.00	0.00	0.00	0.75
2	3	0.00	0.00	0.00	0.00	0.00	0.00	2.06	2.06
4	32	0.09	0.08	0.11	0.56	0.39	0.00	1.14	2.38
4	35	0.00	0.00	0.00	0.69	0.00	1.42	1.41	3.51
4	36	0.16	0.19	0.57	0.42	0.28	1.03	6.24	8.89
4	40	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.46
5A	47	0.03	0.30	0.06	0.38	0.31	0.25	0.00	1.33
5B	16	0.00	0.08	0.00	0.00	0.48	0.00	3.27	3.83
5B	17	0.05	0.00	0.00	0.00	0.35	0.00	0.00	0.40
5B	20	0.09	0.00	0.64	1.04	0.59	0.92	1.87	5.15
5B	37	0.09	0.00	0.18	0.00	0.00	0.00	3.61	3.88
5B	38	0.13	0.17	0.28	0.15	0.00	0.00	2.53	3.26
6	43	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.13
7	49	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
7	50B	0.00	0.00	0.00	0.00	0.00	0.00	1.73	1.73
8	53	0.09	0.00	0.16	0.21	0.00	0.00	0.00	0.45

Table 27: Tree number for baen by compartment and DBH class, 15 cm+ DBH in Sundarban in 2009

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	02	0.00	0.00	0.00	0.00	0.00	0.00	2.12	2.12
1	14	0.00	0.00	0.00	0.00	0.00	0.00	12.73	12.73
1	21	0.00	0.00	0.00	3.54	3.54	0.00	0.00	7.07
1	26	0.00	0.00	3.98	0.00	3.98	7.96	3.98	19.89
1	27	7.07	3.54	3.54	3.54	0.00	0.00	0.00	17.68
2	3	0.00	0.00	0.00	0.00	0.00	0.00	3.98	3.98
4	32	4.55	2.27	2.27	6.82	2.27	0.00	2.27	20.46
4	35	0.00	0.00	0.00	6.37	0.00	6.37	3.18	15.92
4	36	6.37	4.24	10.61	4.24	2.12	4.24	6.37	38.20
4	40	0.00	0.00	0.00	0.00	3.18	0.00	0.00	3.18
5A	47	1.06	7.43	1.06	4.24	2.12	1.06	0.00	16.98
5B	16	0.00	1.68	0.00	0.00	3.35	0.00	3.35	8.38
5B	17	1.87	0.00	0.00	0.00	1.87	0.00	0.00	3.74
5B	20	3.54	0.00	10.61	10.61	3.54	3.54	3.54	35.37
5B	37	3.54	0.00	3.54	0.00	0.00	0.00	7.07	14.15
5B	38	4.24	4.24	4.24	2.12	0.00	0.00	4.24	19.10
6	43	1.99	1.99	0.00	0.00	0.00	0.00	0.00	3.98
7	49	1.68	0.00	0.00	0.00	0.00	0.00	0.00	1.68
7	50B	0.00	0.00	0.00	0.00	0.00	0.00	3.98	3.98
8	53	2.89	0.00	2.89	2.89	0.00	0.00	0.00	8.68

Table 28: Tree Volume (m<sup>3</sup>) for other species by compartment and DBH class

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	01	0.17	0.00	0.45	0.00	0.00	0.00	0.00	0.62
1	02	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.54
1	13	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.85
1	14	0.00	0.00	1.24	0.00	0.00	0.00	0.00	1.24
1	22	0.00	1.09	0.00	1.22	0.00	0.00	0.00	2.30
1	23	0.00	1.62	0.00	0.00	0.00	0.00	0.00	1.62
1	25	0.00	1.16	0.00	0.00	0.00	0.00	0.00	1.16
1	26	0.00	1.59	0.00	5.38	3.45	0.00	0.00	10.41
1	27	1.82	1.05	0.82	0.00	0.00	0.00	0.00	3.69
1	28	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2	03	1.18	1.14	1.97	0.00	0.00	0.00	0.00	4.29
2	09	0.10	0.37	0.55	0.00	0.00	0.00	0.00	1.01
2	10	0.00	0.00	0.00	0.00	0.00	0.00	1.56	1.56
2	11	0.00	0.00	0.37	0.48	0.74	0.00	0.00	1.59
2	12B	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2	15	0.70	0.00	0.82	0.00	0.00	0.00	0.00	1.52
3	04	0.76	1.32	0.55	0.00	1.04	0.00	0.00	3.67
3	05	0.93	1.66	0.00	0.63	0.00	0.00	0.00	3.22
3	07	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.84
3	08	0.29	0.40	0.00	0.43	0.00	0.00	0.00	1.12
3	45	0.00	0.34	0.00	0.00	0.00	0.91	0.00	1.25
4	31	4.57	1.42	4.89	2.40	1.96	0.00	0.00	15.23
4	32	4.98	8.24	9.18	4.63	0.90	2.21	0.00	30.13
4	33	0.99	1.54	2.32	3.67	1.35	0.00	0.00	9.87
4	34	0.00	0.60	0.00	3.43	1.42	3.47	1.74	10.66
4	35	3.24	5.48	4.67	15.11	3.10	0.00	0.00	31.60
4	36	1.44	0.65	4.47	8.55	0.89	1.01	1.05	18.05
4	39	0.69	1.06	0.00	0.00	0.00	0.00	0.00	1.75
4	40	0.28	1.02	0.00	1.81	1.27	0.00	0.00	4.37
5A	46	0.74	3.46	2.54	3.34	0.00	0.00	0.00	10.08
5A	47	0.43	0.36	1.25	0.75	0.00	0.50	0.00	3.29
5B	16	0.19	1.18	0.79	0.00	0.00	0.00	0.00	2.16
5B	17	0.19	0.55	0.00	0.60	1.57	0.00	0.00	2.92
5B	20	0.42	0.57	0.74	0.00	3.14	0.00	0.00	4.87
5B	37	5.07	7.90	10.40	14.89	4.46	0.00	0.00	42.71
5B	38	0.39	2.17	1.51	2.78	3.65	0.00	0.00	10.49
5B	41	0.57	0.29	0.54	0.00	0.00	0.00	0.00	1.40
6	18	0.33	0.81	0.27	1.82	1.15	0.00	0.00	4.38
6	19	0.00	0.00	0.00	1.50	0.00	0.00	0.00	1.50
6	42	1.20	0.00	2.86	0.00	2.54	0.00	0.00	6.60
6	43	0.23	0.38	0.00	0.00	0.00	0.00	0.00	0.61
6	44	0.94	0.32	1.69	1.65	0.00	2.35	0.00	6.95
6	52	0.42	0.00	1.16	0.00	0.00	0.00	0.00	1.58
7	48	0.00	0.00	0.00	1.26	0.00	0.00	1.95	3.21
7	49	0.31	0.22	1.12	0.00	0.72	0.00	0.00	2.37
7	50B	0.32	1.15	0.00	1.53	0.00	0.00	0.00	3.00
8	53	0.00	0.00	0.00	0.00	0.00	1.39	0.00	1.39
8	54	1.54	1.68	1.30	1.55	0.81	0.87	0.84	8.60

8	55	0.17	0.00	0.00	0.95	0.00	0.00	0.00	1.12
---	----	------	------	------	------	------	------	------	------

Table 29: Tree number for other species by compartment and DBH class, 15 cm+ DBH

Block	Comp.	DBH class (cm)							Total
		15-20	20-25	25-30	30-40	40-50	50-60	60+	
1	01	1.99	0.00	1.99	0.00	0.00	0.00	0.00	3.98
1	02	0.00	0.00	2.12	0.00	0.00	0.00	0.00	2.12
1	13	0.00	0.00	3.54	0.00	0.00	0.00	0.00	3.54
1	14	0.00	0.00	6.37	0.00	0.00	0.00	0.00	6.37
1	22	0.00	7.07	0.00	3.54	0.00	0.00	0.00	10.61
1	23	0.00	10.61	0.00	0.00	0.00	0.00	0.00	10.61
1	25	0.00	6.37	0.00	0.00	0.00	0.00	0.00	6.37
1	26	0.00	11.94	0.00	15.92	7.96	0.00	0.00	35.81
1	27	21.22	7.07	3.54	0.00	0.00	0.00	0.00	31.83
1	28	3.98	0.00	0.00	0.00	0.00	0.00	0.00	3.98
2	03	11.94	7.96	7.96	0.00	0.00	0.00	0.00	27.85
2	09	1.14	2.27	2.27	0.00	0.00	0.00	0.00	5.68
2	10	0.00	0.00	0.00	0.00	0.00	0.00	3.18	3.18
2	11	0.00	0.00	1.77	1.77	1.77	0.00	0.00	5.31
2	12B	3.18	0.00	0.00	0.00	0.00	0.00	0.00	3.18
2	15	9.55	0.00	3.18	0.00	0.00	0.00	0.00	12.73
3	04	9.09	9.09	2.27	0.00	2.27	0.00	0.00	22.74
3	05	10.61	10.61	0.00	2.12	0.00	0.00	0.00	23.34
3	07	0.00	0.00	0.00	0.00	2.12	0.00	0.00	2.12
3	08	3.41	2.27	0.00	1.14	0.00	0.00	0.00	6.82
3	45	0.00	1.87	0.00	0.00	0.00	1.87	0.00	3.74
4	31	53.87	9.79	22.04	7.35	4.90	0.00	0.00	97.94
4	32	54.57	54.57	40.93	13.64	2.27	4.55	0.00	170.52
4	33	9.55	9.55	9.55	12.73	3.18	0.00	0.00	44.56
4	34	0.00	3.54	0.00	10.61	3.54	7.07	3.54	28.29
4	35	38.90	35.37	21.22	45.98	7.07	0.00	0.00	148.54
4	36	16.98	4.24	19.10	25.46	2.12	2.12	2.12	72.15
4	39	8.49	6.37	0.00	0.00	0.00	0.00	0.00	14.85
4	40	3.18	6.37	0.00	6.37	3.18	0.00	0.00	19.10
5A	46	9.09	22.74	10.61	10.61	0.00	0.00	0.00	53.05
5A	47	5.31	2.12	5.31	2.12	0.00	1.06	0.00	15.92
5B	16	1.68	6.70	3.35	0.00	0.00	0.00	0.00	11.73
5B	17	1.87	3.74	0.00	1.87	3.74	0.00	0.00	11.23
5B	20	3.54	3.54	3.54	0.00	7.07	0.00	0.00	17.68
5B	37	56.59	49.51	42.44	45.98	10.61	0.00	0.00	205.13
5B	38	4.24	12.73	6.37	8.49	8.49	0.00	0.00	40.32
5B	41	6.82	2.27	2.27	0.00	0.00	0.00	0.00	11.37
6	18	3.98	5.31	1.33	5.31	2.65	0.00	0.00	18.57
6	19	0.00	0.00	0.00	4.55	0.00	0.00	0.00	4.55
6	42	12.73	0.00	12.73	0.00	6.37	0.00	0.00	31.83
6	43	1.99	1.99	0.00	0.00	0.00	0.00	0.00	3.98
6	44	12.24	2.45	7.35	4.90	0.00	4.90	0.00	31.83
6	52	4.90	0.00	4.90	0.00	0.00	0.00	0.00	9.79
7	48	0.00	0.00	0.00	3.98	0.00	0.00	3.98	7.96
7	49	3.35	1.68	5.03	0.00	1.68	0.00	0.00	11.73

7	50B	3.98	7.96	0.00	3.98	0.00	0.00	0.00	15.92
8	53	0.00	0.00	0.00	0.00	0.00	2.89	0.00	2.89
8	54	17.68	10.61	5.31	5.31	1.77	1.77	1.77	44.21
8	55	1.38	0.00	0.00	2.77	0.00	0.00	0.00	4.15

Table 30: Goran in different size classes (Volume, Weight and N/ha) in different compartments

Block	Compartment	Small Stems/ha	Medium Stems/ha	Large Stems/ha	X-Large Stems/ha	Volume (m <sup>3</sup> /ha) Large & X-large	Weight (Kg/ha) large & X-large	Saplings N/ha (small+medium stems)
1	23	14.61627	0	0.00	0	0.000	0	15
2	03	21.11239	1.624	0.05	0	0.000	0	23
2	09	162.403	263.09	8.27	4.8721	0.104	104	425
2	10	271.21302	95.818	3.01	1.624	0.037	37	367
2	11	32.480601	71.457	2.24	0	0.018	18	104
2	12B	27.608511	21.112	0.66	1.624	0.018	18	49
3	04	6.4961201	4.8721	0.15	0	0.001	1	11
3	06	12.99224	29.233	0.92	0	0.007	7	42
3	07	16.2403	144.54	4.54	0	0.036	36	161
3	08	409.25557	683.72	21.48	3.2481	0.197	195	1093
3	45	292.32541	501.83	15.77	17.864	0.267	265	794
4	36	25.984481	11.368	0.36	0	0.003	3	37
6	18	519.68961	454.73	14.29	16.24	0.243	241	974
6	19	9.7441802	11.368	0.36	0	0.003	3	21
6	42	73.081351	95.818	3.01	4.8721	0.063	62	169
6	43	453.10438	940.31	29.54	48.721	0.622	617	1393
6	44	22.73642	56.841	1.79	0	0.014	14	80
6	52	360.53467	617.13	19.39	56.841	0.606	601	978
7	48	53.592991	68.209	2.14	4.8721	0.056	55	122
7	49	215.99599	363.78	11.43	29.233	0.323	320	580
7	50B	168.89912	131.55	4.13	6.4961	0.085	84	300
7	51B	165.65106	610.64	19.18	29.233	0.385	381	776
8	53	630.12365	324.81	10.20	35.729	0.365	362	955
8	54	306.94168	915.95	28.78	63.337	0.732	726	1223
8	55	90.945682	670.72	21.07	64.961	0.684	678	762
5A	46	457.97647	402.76	12.65	22.736	0.281	279	861
5A	47	487.20901	839.62	26.38	25.984	0.416	413	1327
5B	16	34.104631	116.93	3.67	9.7442	0.107	106	151
5B	17	74.705381	243.6	7.65	0	0.061	60	318
5B	20	74.705381	232.24	7.30	3.2481	0.084	83	307
5B	37	21.11239	24.36	0.77	3.2481	0.032	32	45
5B	38	48.720901	97.442	3.06	3.2481	0.050	50	146
5B	41	290.70138	686.96	21.58	12.992	0.275	272	978
		177	295	9	14	0	185	472

Table 31: Number of saplings and Poles by Compartment and DBH class

Block	Comp.	Saplings	2.5-5	5-10	10-15	Total	Saplings	2.5-5	5-10	10-15
		Gewa					Sundri			
1	01	43.77	29.8	173.1	246.7	266.6	127.3	105.4	296.4	529.2
1	02	10.61	4.2	99.7	114.6	299.2	144.3	112.5	428.7	685.4
1	13	10.61	17.7	95.5	123.8	304.2	141.5	70.7	226.4	438.6
1	14	12.73	12.7	44.6	70.0	38.2	44.6	25.5	159.2	229.2
1	21	35.37	488.1	346.6	870.0	208.7	99.0	286.5	293.6	679.1
1	22	45.98	63.7	212.2	321.8	357.2	169.8	28.3	191.0	389.0
1	23	21.22	74.3	541.1	636.6	456.2	254.6	106.1	403.2	763.9
1	24	87.54	103.5	469.5	660.5	421.8	334.2	103.5	374.0	811.7
1	25	6.37	19.1	31.8	57.3	0.0	0.0	0.0	6.4	6.4
1	26	3.98	23.9	107.4	135.3	83.6	163.1	171.1	752.0	1086.2
1	27	7.07	24.8	187.4	219.3	155.6	60.1	60.1	226.4	346.6
1	28	3.98	23.9	63.7	91.5	47.7	51.7	39.8	206.9	298.4
2	03	23.87	63.7	282.5	370.0	306.4	155.2	67.6	389.9	612.7
2	09	109.13	119.4	211.4	439.9	194.4	112.5	95.5	357.0	565.0
2	10	181.44	165.5	187.8	534.8	105.0	98.7	54.1	324.7	477.5
2	11	68.97	81.3	224.6	374.9	325.4	237.0	114.9	643.7	995.6
2	15	28.65	25.5	111.4	165.5	22.3	31.8	73.2	311.9	417.0
2	12A	10.61	127.3	233.4	371.4	74.3	137.9	21.2	339.5	498.7
2	12B	73.21	89.1	136.9	299.2	576.1	111.4	12.7	156.0	280.1
3	04	22.74	56.8	145.5	225.1	195.5	145.5	97.8	522.9	766.2
3	05	8.49	23.3	133.7	165.5	50.9	106.1	93.4	420.2	619.6
3	06	43.77	135.3	246.7	425.7	71.6	119.4	135.3	461.5	716.2
3	07	93.37	97.6	235.5	426.5	214.3	205.8	87.0	401.1	693.9
3	08	185.30	133.0	185.3	503.6	83.0	71.6	51.2	159.2	281.9
3	45	166.64	121.7	222.8	511.2	103.0	73.0	54.3	191.0	318.3
4	29	25.46	31.8	235.5	292.8	171.9	203.7	108.2	490.2	802.1
4	31	41.63	22.0	61.2	124.9	418.7	85.7	75.9	178.7	340.3
4	32	27.28	59.1	36.4	122.8	156.9	88.7	50.0	197.8	336.5
4	33	19.10	47.7	222.8	289.7	337.4	254.6	136.9	337.4	728.9
4	34	81.35	155.6	640.2	877.1	28.3	35.4	63.7	247.6	346.6
4	35	70.74	63.7	166.2	300.6	229.9	201.6	92.0	191.0	484.5
4	36	65.78	67.9	205.8	339.5	61.5	21.2	17.0	67.9	106.1
4	39	38.20	46.7	188.9	273.7	121.0	127.3	123.1	439.3	689.7
4	40	130.51	92.3	353.3	576.1	63.7	73.2	63.7	175.1	311.9
5A	46	139.45	124.3	280.4	544.2	104.6	40.9	18.2	0.0	59.1
5A	47	87.00	78.5	211.1	376.7	41.4	61.5	53.1	0.0	114.6
5B	16	16.75	40.2	259.7	316.6	90.5	72.0	78.7	0.0	150.8
5B	17	65.53	140.4	318.3	524.3	46.8	65.5	69.3	0.0	134.8
5B	20	70.74	109.6	187.4	367.8	49.5	63.7	49.5	0.0	113.2
5B	37	14.15	46.0	95.5	155.6	10.6	21.2	10.6	0.0	31.8
5B	38	10.61	25.5	72.2	108.2	10.6	21.2	34.0	0.0	55.2
5B	41	209.18	170.5	313.8	693.5	20.5	61.4	45.5	0.0	106.9
6	18	94.17	123.3	271.9	489.4	90.2	114.1	45.1	252.0	411.2
6	19	40.93	77.3	270.6	388.8	11.4	22.7	59.1	281.9	363.8
6	42	146.42	133.7	146.4	426.5	0.0	19.1	12.7	114.6	146.4
6	43	167.11	222.8	555.1	945.0	23.9	73.6	117.4	318.3	509.3
6	44	66.11	80.8	347.7	494.6	2.4	19.6	36.7	215.5	271.8
6	52	161.60	124.9	413.8	700.3	14.7	31.8	24.5	68.6	124.9



7	48	39.79	47.7	270.6	358.1	0.0	4.0	8.0	4.0	15.9
7	49	120.62	132.3	484.2	737.1	16.8	26.8	28.5	10.1	65.3
7	50B	19.89	175.1	1122.0	1317.0	0.0	0.0	0.0	0.0	0.0
7	51B	187.80	194.2	289.7	671.6	0.0	0.0	0.0	0.0	0.0
8	53	274.90	130.2	622.2	1027.3	138.9	63.7	37.6	0.0	101.3
8	54	31.83	63.7	171.5	267.0	70.7	76.0			
8	55	83.04	153.6	445.6	682.3	0.0	0.0			

Table 31: (Continued) Number of saplings and Poles by Compartment and DBH class

Block	Comp.	Saplings			Poles			Total	Total for poles	Grand total
		Others	2.5-5	5-10	10-15					
1	01	16	0.50	222.8	61.7	4.0	288.5	1064.3		
1	02	15	0.47	34.0	12.7	29.7	76.4	876.4		
1	13	9	0.28	21.2	7.1	3.5	31.8	594.2		
1	14	5	0.16	19.1	19.1	0.0	38.2	337.4		
1	21	9	0.28	14.1	7.1	14.1	35.4	1584.5		
1	22	9	0.28	24.8	10.6	3.5	38.9	749.8		
1	23	3	0.09	53.1	0.0	0.0	53.1	1453.6		
1	24	4	0.13	31.8	15.9	8.0	55.7	1527.9		
1	25	5	0.16	0.0	6.4	0.0	6.4	70.0		
1	26	8	0.25	31.8	15.9	43.8	91.5	1313.0		
1	27	9	0.28	92.0	95.5	56.6	244.0	809.9		
1	28	8	0.25	143.2	87.5	115.4	346.2	736.1		
2	03	8	0.25	103.5	31.8	15.9	151.2	1134.0		
2	09	28	0.88	5.7	0.0	4.5	10.2	1015.2		
2	10	10	0.31	3.2	0.0	0.0	3.2	1015.4		
2	11	18	0.57	21.2	8.8	3.5	33.6	1404.1		
2	15	10	0.31	44.6	19.1	19.1	82.8	665.3		
2	12A	3	0.09	53.1	74.3	0.0	127.3	997.4		
2	12B	10	0.31	25.5	12.7	12.7	50.9	630.3		
3	04	14	0.44	40.9	45.5	20.5	106.9	1098.2		
3	05	15	0.47	23.3	21.2	25.5	70.0	855.2		
3	06	8	0.25	15.9	0.0	0.0	15.9	1157.9		
3	07	15	0.47	2.1	0.0	4.2	6.4	1126.8		
3	08	28	0.88	9.1	3.4	2.3	14.8	800.3		
3	45	17	0.53	11.2	1.9	3.7	16.9	846.3		
4	29	5	0.16	12.7	0.0	0.0	12.7	1107.7		
4	31	13	0.41	208.1	134.7	217.9	560.7	1025.9		
4	32	14	0.44	50.0	54.6	77.3	181.9	641.2		
4	33	10	0.31	35.0	6.4	15.9	57.3	1075.9		
4	34	9	0.28	38.9	21.2	0.0	60.1	1283.8		
4	35	9	0.28	38.9	38.9	46.0	123.8	909.0		
4	36	15	0.47	42.4	4.2	40.3	87.0	532.6		
4	39	15	0.47	50.9	21.2	19.1	91.2	1054.7		
4	40	10	0.31	70.0	6.4	0.0	76.4	964.5		
5A	46	21	0.66	10.6	1.5	9.1	21.2	1050.4		
5A	47	30	0.94	1.1	0.0	0.0	1.1	352.3		
5B	16	19	0.60	0.0	1.7	6.7	8.4	159.2		
5B	17	17	0.53	0.0	5.6	3.7	9.4	1378.1		
5B	20	9	0.28	0.0	0.0	14.1	14.1	1121.2		

5B	37	9	0.28	10.6	0.0	3.5	14.1	1206.0
5B	38	15	0.47	104.0	4.2	6.4	114.6	314.1
5B	41	14	0.44	2.3	0.0	4.5	6.8	1095.9
6	18	24	0.75	0.0	0.0	2.7	2.7	441.7
6	19	14	0.44	0.0	0.0	6.8	6.8	486.6
6	42	5	0.16	0.0	0.0	0.0	0.0	#REF!
6	43	16	0.50	9.9	11.9	4.0	25.9	801.7
6	44	13	0.41	4.9	0.0	31.8	36.7	570.5
6	52	13	0.41	0.0	0.0	0.0	0.0	1207.1
7	48	8	0.25	11.9	0.0	27.9	39.8	1623.4
7	49	19	0.60	67.0	30.2	31.8	129.0	904.7
7	50B	8	0.25	171.1	35.8	39.8	246.7	1356.8
7	51B	10	0.31	50.9	3.2	3.2	57.3	1177.7
8	53	11	0.35	11.6	11.6	20.3	43.4	437.0
8	54	18	0.57	23.0	10.6	19.5	53.1	146.8
8	55	23	0.72	12.5	0.0	4.2	16.6	123.2

Table 32: Distribution of volume (V10/ha) of poles 10-15 cm DBH class in Sundarban in 2009

Block	Comp.	Gewa 10-12	Gewa 12-15	Baen	Keora	Others	Sundri	Total
1	01	0.807	3.919	0.000	0.000	0.103	12.187	17.016
1	02	0.382	2.130	0.044	0.000	0.592	15.291	18.439
1	13	0.586	0.653	0.000	0.000	0.040	5.400	6.679
1	14	0.069	0.334	0.000	0.000	0.000	1.894	2.297
1	21	1.970	2.126	0.000	0.000	0.184	6.814	11.094
1	22	1.126	1.690	0.000	0.000	0.077	4.171	7.064
1	23	0.846	1.624	0.000	0.000	0.000	2.605	5.075
1	24	0.833	2.252	0.000	0.000	0.042	3.945	7.072
1	25	0.122	0.068	0.000	0.000	0.000	0.062	0.252
1	26	0.451	0.818	0.064	0.000	0.461	15.816	17.611
1	27	0.648	2.156	0.269	0.000	0.595	5.387	9.054
1	28	0.202	0.720	0.000	0.000	1.209	4.314	6.445
2	03	1.025	2.615	0.000	0.000	0.210	6.570	10.420
2	09	3.540	4.752	0.000	0.000	0.215	20.546	29.054
2	10	1.182	1.228	0.000	0.000	0.000	6.734	9.144
2	11	2.300	3.421	0.083	0.000	0.039	23.656	29.499
2	12A	0.223	1.046	0.000	0.000	0.000	2.722	3.991
2	12B	0.722	1.207	0.000	0.000	0.213	3.922	6.065
2	15	0.429	1.281	0.000	0.000	0.251	8.343	10.304
3	04	1.087	1.868	0.000	0.000	0.386	15.152	18.493
3	05	0.828	2.419	0.000	0.000	0.672	14.153	18.072
3	06	0.774	2.510	0.000	0.000	0.000	7.699	10.983
3	07	2.106	2.718	0.056	0.000	0.071	12.223	17.174
3	08	2.752	4.485	0.000	0.000	0.088	9.414	16.738
3	45	1.636	3.951	0.000	0.000	0.105	6.328	12.020
4	29	0.641	1.058	0.000	0.000	0.000	6.255	7.954

4	31	0.479	0.560	0.000	0.000	4.007	5.557	10.603
4	32	0.157	0.634	0.143	0.000	1.465	6.669	9.067
4	33	1.289	1.821	0.000	0.000	0.211	7.082	10.403
4	34	2.620	6.266	0.000	0.000	0.000	5.728	14.614
4	35	0.813	1.166	0.063	0.000	0.592	3.516	6.150
4	36	1.696	2.771	0.115	0.000	0.985	2.350	7.917
4	39	1.252	3.274	0.000	0.000	0.398	15.785	20.708
4	40	2.010	2.776	0.000	0.000	0.000	3.876	8.663
5A	46	3.735	3.890	0.000	0.000	0.418	0.511	8.555
5A	47	3.098	5.883	0.565	0.000	0.521	2.737	12.805
5B	16	2.224	5.449	0.152	0.000	0.375	16.895	25.095
5B	17	2.759	5.461	0.000	0.000	0.035	20.162	28.417
5B	20	0.924	1.498	0.000	0.090	0.211	4.653	7.376
5B	37	0.595	0.602	0.000	0.000	0.582	0.797	2.575
5B	38	0.612	0.798	0.000	0.000	0.129	3.730	5.269
5B	41	2.489	3.393	0.000	0.000	0.074	1.213	7.169
6	18	3.537	5.676	0.000	0.000	0.269	13.321	22.802
6	19	1.709	4.256	0.000	0.000	0.000	8.633	14.599
6	42	0.285	0.831	0.000	0.000	0.206	1.122	2.444
6	43	4.223	9.387	0.045	0.000	0.044	10.864	24.563
6	44	1.867	5.061	0.000	0.000	0.164	6.341	13.434
6	52	3.467	3.423	0.000	0.000	0.059	1.718	8.668
7	48	1.244	1.695	0.094	0.049	0.030	0.084	3.195
7	49	4.395	9.554	0.000	0.000	0.111	0.268	14.329
7	50B	4.024	9.990	0.091	0.000	0.074	0.000	14.179
7	51B	1.647	2.181	0.000	0.000	0.096	0.000	3.925
8	53	3.216	6.910	0.000	0.000	0.083	2.080	12.289
8	54	1.535	3.110	0.000	0.000	0.632	3.165	8.442
8	55	5.052	10.333	0.000	0.000	0.000	0.000	15.386

Table 33: Distribution of number of stems of poles 10-15 cm DBH class in Sundarban in 2009

Block	Comp.	Gewa 10-12	Gewa 12-15	Baen	Keora	Others	Sundri	Total
1	01	31	74	0	0	2	180	288
1	02	17	40	1	0	16	244	318
1	13	21	12	0	0	1	77	111
1	14	2	6	0	0	0	30	39
1	21	77	41	0	0	5	100	224
1	22	41	31	0	0	1	65	139
1	23	31	30	0	0	0	46	108
1	24	31	40	0	0	1	57	129
1	25	5	1	0	0	0	1	7
1	26	17	16	1	0	12	229	275

1	27	27	38	5	0	15	77	161
1	28	7	12	0	0	35	63	117
2	03	40	46	0	0	5	119	209
2	09	134	91	0	0	5	380	610
2	10	48	23	0	0	0	123	195
2	11	88	65	1	0	1	440	597
2	12A	8	18	0	0	0	39	65
2	12B	28	24	0	0	5	59	116
2	15	18	24	0	0	7	119	168
3	04	42	35	0	0	11	278	367
3	05	30	46	0	0	15	240	330
3	06	30	45	0	0	0	140	215
3	07	83	51	1	0	1	229	365
3	08	110	87	0	0	2	169	369
3	45	69	75	0	0	2	123	270
4	29	24	21	0	0	0	93	138
4	31	21	10	0	0	108	88	226
4	32	7	12	4	0	38	105	166
4	33	50	35	0	0	6	128	219
4	34	103	116	0	0	0	85	304
4	35	35	22	1	0	15	65	138
4	36	63	54	2	0	21	39	179
4	39	50	58	0	0	11	250	369
4	40	80	54	0	0	0	67	201
5A	46	148	76	0	0	8	10	242
5A	47	125	116	11	0	12	63	327
5B	16	85	103	2	0	10	254	454
5B	17	104	102	0	0	1	333	540
5B	20	39	25	0	1	7	74	146
5B	37	22	11	0	0	13	15	61
5B	38	25	16	0	0	4	64	109
5B	41	102	65	0	0	2	24	194
6	18	140	108	0	0	7	230	485
6	19	67	77	0	0	0	150	294
6	42	11	17	0	0	5	22	54
6	43	160	178	1	0	1	194	534
6	44	74	98	0	0	5	106	283
6	52	137	68	0	0	1	34	240
7	48	51	31	1	1	1	1	87
7	49	169	180	0	0	2	7	359
7	50B	155	186	1	0	1	0	344
7	51B	69	41	0	0	4	0	114
8	53	127	133	0	0	2	39	301

8	54	58	59	0	0	16	59	192
8	55	197	192	0	0	0	0	390

Table 34: Tree Volumes V10 (m<sup>3</sup>) by compartment and species, 15 cm+ DBH in Sundarban in 1996

Block	Comp.	Total	Baen	Gewa	Keora	Sundri	Others
1	01	42.611	0.000	3.312	0.000	37.948	1.351
1	02	75.600	10.985	2.474	22.140	39.761	0.241
1	13	48.752	0.000	1.145	0.000	47.607	0.000
1	14	63.578	0.000	3.339	0.000	58.941	1.299
1	21	52.818	0.000	0.658	0.000	50.996	1.164
1	22	60.311	1.801	0.000	0.000	55.624	2.886
1	23	16.372	0.000	0.000	0.000	12.004	4.368
1	24	43.132	0.000	1.424	0.000	41.708	0.000
1	25	25.021	2.877	0.401	0.000	14.210	7.534
1	26	24.449	0.000	5.024	0.000	19.425	0.000
1	27	39.049	0.000	3.921	0.000	35.128	0.000
1	28	30.220	0.000	6.587	0.000	20.715	2.917
2	03	32.745	1.079	0.676	0.000	29.751	1.239
2	09	7.257	0.000	0.665	0.000	6.317	0.275
2	10	13.675	0.000	0.480	0.000	11.238	1.957
2	11	21.158	0.000	0.394	0.000	20.211	0.553
2	12A	19.208	0.000	2.006	0.000	16.617	0.585
2	12B	17.760	0.000	0.492	0.000	17.268	0.000
2	15	59.020	0.000	0.923	0.000	57.634	0.463
3	04	38.768	0.000	0.487	0.000	35.901	2.380
3	05	39.935	0.000	9.377	0.000	28.580	1.978
3	06	121.781	0.000	5.157	95.117	21.507	0.000
3	07	9.146	1.452	1.263	0.000	6.431	0.000
3	08	19.897	0.000	0.828	4.583	13.932	0.554
3	45	9.205	0.000	2.169	0.000	7.036	0.000
4	29	95.643	0.000	3.301	0.000	92.342	0.000
4	31	58.870	6.502	7.601	0.000	42.809	1.958
4	32	34.718	7.458	0.335	0.000	9.721	17.204
4	33	51.990	0.000	1.430	0.000	42.672	7.889
4	34	17.778	0.000	1.434	0.000	16.344	0.000
4	35	18.672	2.831	0.453	0.000	12.272	3.115
4	36	56.744	15.249	1.921	0.000	21.693	17.881
4	39	36.491	0.619	1.972	0.000	32.576	1.325
4	40	62.517	38.531	0.443	0.000	20.347	3.197
5A	46	14.766	0.000	1.544	0.000	0.254	12.968
5A	47	9.238	1.579	1.331	1.507	0.115	4.706
5B	16	29.303	0.000	1.701	0.000	27.602	0.000
5B	17	22.242	0.000	1.908	0.000	19.097	1.237
5B	20	49.125	6.763	1.300	11.916	26.009	3.136
5B	37	39.909	0.000	6.740	0.000	16.379	16.789
5B	38	50.939	13.003	2.164	6.081	22.297	7.394
5B	41	4.208	0.000	0.477	0.000	0.899	2.832
6	18	18.586	0.000	0.500	0.000	17.755	0.332
6	19	33.783	0.000	0.424	0.000	32.885	0.475

6	42	7.935	0.000	0.000	0.000	5.727	2.208
6	43	20.899	0.000	6.509	8.536	5.853	0.000
6	44	30.283	0.000	6.908	7.584	9.121	6.671
6	52	3.695	0.000	1.895	0.000	0.000	1.801
7	48	1.093	0.000	0.000	0.000	0.000	1.093
7	49	2.385	0.000	1.598	0.000	0.000	0.787
7	50B	12.985	0.000	9.484	0.000	0.000	3.501
7	51B	3.146	0.000	1.327	0.000	0.000	1.818
8	53	18.788	0.000	11.509	0.000	2.085	5.194
8	54	1.997	0.000	0.930	0.000	0.000	1.066
8	55	1.872	0.000	1.872	0.000	0.000	0.000