

THE CLEAR FELLING SYSTEM AND ITS PROSPECTS FOR THE  
FORESTS OF THE SUNDERBANS.

BY

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SUMMARY:

A study on the succession of species in the clear felled areas of tidal forests of the Sunderbans revealed that the clear felled area was filled up by Gewa and Sundri within 2-3 years of such felling. Gewa was found to be the first coloniser followed by Sundri. On average, the percentages of occurrence of Gewa & Sundri had been found to be 53 & 27 respectively. Sundri followed Gewa in height growth in first 10 years & formed a co-dominant associate while the dominating species Gewa attained the average height of 15' in 10 years' time with a b.h diameter of 3".

The study also revealed that due to clear felling the site did not deteriorate, rather improved which was indicated by the presence of seedlings in thickets. The presence of established seedlings in almost all the clear-felled areas indicated that these areas might be worked under a clear felling system followed by artificial or aided natural regeneration.

INTRODUCTION:

For about a century, the tidal forests of the -

Sunderbans have been managed under selection system. The selected trees of specific size have been felled annually from the annual coupes belonging to different felling series and cutting sections. Under this Selection System the main technical activities namely the main felling & subsidiary felling operations can not be properly controlled or checked as these operations cover a total area of more than 35,000.0 acres each year. Thus the least check on most vital selection marking operations & complete reliance on the merit & judgement of less qualified large number of marking staff, are progressively leading the forests of Sunderbans to-ward ill-management.

Concentration of technical operations and greater supervision to all forestry works are only possible if the forests are managed under clear-cutting system or Uniform System. The application of these two most economic systems pre-supposes 3 basic findings which are:-

- 1) Whether the site after such fellings will deteriorate or not,
- 2) Whether regeneration will be assured after the crop is removed by such fellings &
- 3) Whether the Silvicultural characteristics of the species will suit the requirements for the application of such a system.

Having these points in view, the authors of this paper selected the problem to study the trend of succession of tidal species in the clear-felled areas & examined as up to what extent the cleared site deteriorates or improves, in order to evaluate the possibility of introducing a more economic management system for the Sunderbans than the existing one.

OBJECTS: The main objects of the successional studies in the clear-felled areas might be enumerated as under:-

- 1)- To study the trend of succession in the old & clear-felled areas by total enumeration of species,
- 2)- To ascertain the occurrence of individual species with percentage in the clear-felled areas under direct sun light,
- 3)- To compare the height growth & crown development of the succeeding species in order to distinguish dominants, co-dominants & suppressed associates in composition, &
- 4)- To examine the possibility of introducing a more economic system of management & to find out as to what extent the site may deteriorate or improve due to the introduction of such system.

METHOD:

1)- Selection of site: Almost in every year, in the Sunderbans a few annual coupe offices are constructed. Before these temporary offices & other residential buildings are constructed, the site which is normally 5-8 acres in size is cleared of all vegetation. After 2-3 years of working the coupe, the temporary building materials are taken to the new site & the old clear-felled area is left unplanted or uncared for.

The authors therefore thought that the cleared & abandoned coupe office sites of different years could be good grounds for studying the trend of succession of species in the Sunderbans. On the basis of this idea, some 14 coupe office sites which were cleared in different years were selected & located in Sarankhola, Chandpai & Khulna felling series.

2)- Laying out of sample plot: Within the clear-felled area a left-out standing tree of any species was located & painted with red bands. Taking this tree as one corner-one square chain sample plot was laid out. In absence of such tree a strong wooden pole was inserted into the ground & taking it as one corner the sample plot was laid out. All the other corners of the sample plot were distinguished by corner poles painted with red bands. The 4- lines joining the corners were cleared of the bushes. In the sample plot small strips

were made by log lines in order to facilitate enumeration.

3)- Enumeration of species: Total enumeration was done by counting all species in composition. Average height, diameter at base & b.h of the main species were recorded.

4)- Dominance & co-dominance of species: The species whose crowns were beyond the reach of other associates were taken to be dominants. Occular estimate of dominance was supported by height growth. Co-dominants were those whose crowns followed the crowns of the dominants. Occular estimate of co-dominance was supported by height growth.

5)- Area Coverage: The percentage of area coverage was occularly determined by comparing the fully covered sample plots with the one studied.

6)- Height & diameter measurement: 1-4 years' crops (Table No.-1, Plot No-8,9,10,11,12 & 13) were measured for height directly by measuring rods. The heights of species having ages beyond 4 years were measured by Abney's Level. Diameter at breast height was measured in case of species having more than 4 years of age.

### RESULTS:

The tables presented below show the data with remarks regarding the sample plots studied during the study trip. The detailed accounts of species with remarks have been presented in appendix 'A' for each Sample plot.

Table No. 2 : Showing the location, Yr. of felling, area of sample plot & Growth data in respect of Keora, Kakra & Misc. species at 'Fultala' centre.

Yr. of felling: 1964-65.

Area of the sample plot: 66' X66'.

Compartment No: 35/E (Khulna Range).

PLOT NO	AGE	KEORA		KANKRA		PASSUR		MISC.		Misc. SPP.			
		NO.	HT. %	NO.	HT. %	NO.	HT. %	NO.	HT. %	NO.	HT. %		
14	6	35	28	2.3	94.4	7	67.3	300	-	22.2	120	-	8.2

TABLE NO. - 1

SHOWING THE LOCATIONS, YR. OF FELLING, AREA OF THE  
SAMPLE PLOT AND GROWTH DATA IN RESPECT OF GEWA,  
SUNDRI AND MISC. SPECIES OF 13 CENTRES.

Plot No.	Age in Yrs.	Locality, Yr. of felling & Area of sample Plot	Gewa			Sundri			Misc. spp.		Area coverage %
			No.	Ht. (Ft.)	%	No.	Ht. (Ft.)	%	No.	%	
1.	11	Kalamula, 59-60, 66'x66'	647	15	64.64	241	10	24.08	113	11.28	100
2.	10	Charabetmore, 60-61, 66'x66'	3059	5	37.10	3768	-	45.70	1118	17.20	100
3.	9	Aliabanda, 61-62, 66'x66'	92	15	23.65	157	10	40.35	140	36.00	70
4.	8	Kagaboga, 62-63, 66'x66'	564	7	57.23	135	6	14.00	265	27.50	50
5.	8	Morabhola, 62-63, 66'x66'	290	15	59.18	131	10	26.33	69	16.49	85
6.	7	Dhainghari, 63-64, 66'x33'	10	10	17.25	9	7	15.50	39	67.25	60
7.	6	Supoti, 64-65, 66'x22'	1261	9	70.00	262	-	14.60	278	15.40	100
8.	4	Ganderkhali, 66-67, 66'x66'	570	7	54.08	273	5	25.92	211	20.00	50
9.	4	Shawla, 66-67, 66'x66'	183	7	50.32	170	5	46.88	10	2.80	30
10.	3	Nishankhali, 67-68, 66'x33'	117	4½	54.70	30	2	40.00	67	31.30	40
11.	2	Chhotosiala, 68-69, 66'x66'	464	5½	31.60	954	5	64.72	56	3.79	40
12.	1	Japha, 69-70, 66'x22'	2808	11	76.16	90	1¼	2.44	789	21.40	40
13.	1	Jhalia, 69-70, 66'x33'	5675	-	94.02	337	1½	5.55	26	0.43	50

REMARKS: Plot No.1-5: Gewa dominant, Plot No.6 Baen dominant, Ht.=13', Plot No.7-11 Gewa dominant, Plot No.12 Baen dominant, Plot No.13 Goran dominant.

ABSTRACT:

No. of sample plot studied = 14  
 Average percentage of Gewa = 53.00  
 Average percentage of Sundri = 27.00  
 Average percentage of Misc.Spp. = 20.00  
 Average percentage of blank area = 37.30  
 Average percentage of covered area = 62.70

(Miscellaneous Species include all other species except Gewa & Sundri)

DISCUSSION & ANALYSIS OF DATA:

The successional study conducted during the second half of september '70 reveals that the clear-felled areas do not deteriorate due to complete exposure to climatic, edaphic & biotic factors. Rather with the enhanced biological activities on litter & slash, the soil texture & nutrient <sup>state</sup> improve due to a accumulation of humus which in turn helps the seedlings to grow in thickets.

As far as the silvicultural characteristics of species in respect of light are concerned, it has been observed that both Gewa & Sundri have formed pure & uniform patches in many areas under direct sun light. In mixture Sundri has been found to grow well under shade of Gewa. From this observation it may be concluded that Sundri is adapted to direct sun light & also varied intensities of light available.

Considering all these points it may be safely opined that Sundri & Gewa, the two main species of Sunderbans may be worked under clear-felling or uniform system.

During the last trip in the Sunderbans some 14 sample plots were studied. The crops of these plots aged from 11 to 1 year. In 10 cases out of 14, Gewa formed the dominant crop with 53 percent frequency of occurrence ( Table No. 1 ) Sundri occurred 27 times out of 100 & formed a co-dominant associate of Gewa.

In older areas out of 14 sample plots, Sundri was found to be in advantage in height growth & tended to overtop other associates except Gewa.

In two cases out of 14 'Bean' was the dominant species ( Table No. 1, Plot No. 6<sup>8</sup>12 ). Goran formed the dominant crop in one place out of 14 (Table No. 1, Plot No- 13). In 'Fultala' 'Keora' was found to be the dominant species. Some clues on 'Keora' regeneration problem may be obtained from this place as 'Keora' has been found to regenerate itself well in the old & clear-felled site (Table No. 2).

A NOTABLE OBSERVATION:

During the study some marshy areas were also found within some of the sample plots. Tamarix gallica, Pandanus & Tiger Fern bushes were found to inhabit the marshes which having elevated fringes & depressed centers had created some problems to the regeneration. It was thought that some artificial measures could be undertaken to provide drainage to the marshes for aiding regeneration to replanish the growing stock. Sundri and Gewa

were not found to grow & regenerate in these lowlying marshey areas.

CONCLUSION: The data as recorded & observations made during the study trip lead the authors to conclude on the subject as follows:-

- 1) After clear-felling the area is covered up mainly by 'Gewa' & 'Sundri' within 3-4 years of such felling.
- 2) The speed of regeneration may be more accelerated if some mother trees are kept in & within the vicinity of the area to be regenerated.
- 3) The clear-felled site has not been found to deteriorate.
- 4) 'Gewa' will always colonise on the clear felled site first- followed by 'Sundri'.
- 5) The area coverage is 100% assured after 10 years' of clear-felling under normal conditions.

It was possible to get records of the last 10 years' coupes of different felling series & cutting sections. So the data presented in this paper regarding the successional studies include areas clear-felled from 1-10 years age only.

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## GLOSSARY OF NAMES OF PLANTS

<u>Vernacular name</u>	<u>Botanical name</u>	<u>Family</u>
Amur	<u>Amoora cucullata</u>	Meliaceae
Baen	<u>Avicennia officinalis</u>	Verbenaceae
Ban-jan	<u>Eugenia fruticosa</u>	Rutaceae
Bhola	<u>Hibiscus tilliaceous</u>	Malvaceae
Dhundal	<u>Carapa cbovata</u>	Meliaceae
Garjan	<u>(Rhizophora conjugata)</u>	Rhizophoraceae
Golpatta	<u>R. Mucronata.</u> <u>Nipa fruticans</u>	Palmae
Goran	<u>Ceriops rexburghiana</u>	Rhizophoraceae
Hantel	<u>C. Candelleana.</u> <u>Phoenix paludosa</u>	Palmae
Hodo	<u>(or Tiger/Acrostichum aureum Fern)</u>	
Jir	<u>Ficus retusa</u>	Moraceae
Kankra	<u>Bruguiera gymnorhiza</u>	Rhizophoraceae
Keora	<u>Sonneratia apetala</u>	Sonneratiaceae
Kewa-Kanta	<u>Pandanus, pordoratissimus,</u> <u>Syn. P. fascicularis.</u>	Pandanaceae
Khalsi	<u>Aegiceras majus</u>	Myrsinaceae
Kripa or Kirpa	<u>Lumnitzera, racemosa</u>	Combretaceae
Passur	<u>Carapa moluccensis</u> <u>Leguminosae var. gangetica.</u>	
Nono-Jhao	<u>Tamarix gallica Var.indica</u>	
Singra	<u>Cynometra ramiflora Syn.</u> <u>C. Mimosoides.</u>	Leguminosae
Sundri	<u>Heritiera minor Syn. H</u> <u>Fomes.</u>	Sterculiaceae
Gewa	<u>Excoecaria agallocha</u>	Euphorbiaceae

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APPENDIX - A. Serial No-1  
Plot

Date of enumeration... 26-9-1970.

Range ... CHADPA!.....

Local Name ... KALAMULA.....

Contt. No.... 14.....

Year of felling.. 1959-60:.....

Area of sample plot. 66' X 66'....

Table showing the results of enumeration of species contained in the sample plot.

No.	SEEDLING					COPPICE				REMARKS.
	Spp.	No.	ht.	dia	%	No.	ht.	dia	%	
1.	Gewa.	524	15'	—	66.83	123	25'	2"	56.68	1. Sundri is found to be in advantage in height growth. 2. Dominant species is Gewa. 3. Goran associated with Tiger fern forms the undergrowth. 4. 1 (one) year old seedling of Sundri many. 5. Height of the pneumatophore of Sundri is found to be 3".
2.	Sundri.	165	10'	—	21.06	76	20'	1"	35.02	
3.	Goran.	91	—	—	11.60	18	3'	—	8.30	
4.	Amoor	4	—	—	00.51					

ABSTRACT

Area coverage in %	
Blank	Covered
X	100.

Spp.	No.	%	Remarks
Gewa	647	64.64	Dominant
Sundri	241	24.08	Co-dominant.
Goran	109	10.89	Undergrowth.
Misc.	4	0.39	

A P P E N D I X - A.

Succession of Spp. in Sunderbans

Serial No - 2.

Date of enumeration. 26-9-1970.

Range .. SHARAN KHOLA .....

Local Name CHARA BETMORE. (Gen. Camp)

Comptt. No. 2 .....

Year of felling... 1960-61 .....

Area of sample plot. 66' X 66'

Table showing the results of enumeration of species contained in the sample plot.

Sl. No.	SEEDLING				COPPICE				REMARKS.	
	Spp.	No.	ht.	dia	%	No.	ht.	dia		%
1.	Gewa.	3059.	5'	-	37'10	-	-	-	-	1. Tamarix is the first coloniser.
2.	Sundri	3768	-	-	45'70	-	-	-	-	2. Goran found to grow under Gewa.
3.	Goran.	1223	2'	-	14'84	-	-	-	-	3. About 99% Seedlings of Sundri are 1 year old.
4.	Tamarix	54	}	-	2'36	}	-	-	-	4. About 80% Seedlings of Gewa are 1 (one) year old.
5.	Amor	42								
6.	Passur	39								
7.	Singra.	56								
8.	Kankra.	1								
9.	Baen.	1								
10.	Dhandul	1								
11.	Pandanus	1								

ABSTRACT

Area coverage in %	
Blank	Covered
x	100

Spp.	No.	%	Remarks
Gewa	3059.	37'10	- Dominant.
Sundri	3768.	45'70	- Suppressed.
Goran.	1223.	14'84	- Co-dominant
Misc.	195.	02'36.	- Suppressed

## Succession of Spp. in Sunderbans

APPENDIX - A. <sup>PLOT</sup> Serial No - 3.

Date of enumeration... 25-9-1970...

Range... SHARANKHOLA.....

Local Name... ALIABANDA.....

Comptt. No... 2/B.....

Year of felling... 1961-62.....

Area of sample plot... 66' X 66'..

Table showing the results of enumeration of species contained in the sample plot.

Sl. No.	SEEDLING				COPPICE				REMARKS.	
	Spp.	No.	ht.	dia	%	No.	ht.	dia		%
1.	Gewa	92	15'	3"	23.65					1. From 70% covered area about 30% area is covered by Phoenix sp., Hibiscus sp. and bushes of Pandanus sp. 2. Crop condition is good.
2.	Sundri	157	10'	1 1/2"	40.35					
3.	Tamarix sp.	61								
4.	Eugenia sp.	2								
5.	Amor.	2								
6.	Pandanus sp.	37								
7.	Goran	7			36.00					
8.	Hibiscus sp.	3								
9.	Phoenix sp.	28								

## ABSTRACT

Area coverage in %	
Blank	Covered
30	70

Spp.	No.	%	Remarks
Gewa	92	23.65	Dominant.
Sundri	157	40.35	Co dominant.

A P P E N D I X - A.

<sup>Plot</sup>  
Serial NO-4.

Date of enumeration... 27-9-1970.

Range ... CHANDPAL.....

Local Name ... KAKABOGA.....

Comptt. No. ... 9.....

Year of felling... 1962-63.....

Area of sample plot.. 66' x 66'..

Table showing the results of enumeration of species contained in the sample plot.

Sl. No.	SEEDLING				COPPICE				REMARKS.	
	Spp.	No.	ht.	dia	%	No.	ht.	dia		%
1.	Gewa.	522	4'-1 1/2"	1"	57.93	42	10'	1 1/4"	80.77	1. Tamarix sp are grass in the depression. Growth is weak. Species was found to in flowering condition. 2. Pneumatophores absent. 3. Sundri Seedlings are very few.
2.	Sundri	126	4'-6"	1 1/2"	13.82	9	7'-4"	1 1/2"	17.30	
3.	Singra.	1								
4.	Phoenix Sp.	10								
5.	Tamarix sp.	214	-	-	28.95	1	-	-	1.93	
6.	Goran.	7								
7.	Passar.	19								
8.	Baen.	13								

ABSTRACT

Area coverage in %	
Blank	Covered
50	50

Spp.	No.	%	Remarks
Gewa	564	58.50	Dominant.
Sundri	135	14.00	Co-dominant
Misc.	265	27.50	Tamarix sp. maximum.

## Succession of Spp. in Sunderbans

## APPENDIX - A.

Serial no - 5.  
Plot

Date of enumeration... 25-9-1970

Range... SHARAN KHOLA.....

Local Name... MORABHOLA.....

Commt. No... 2/e.....

Year of felling... 1962-63.....

Area of sample plot... 66' x 66'..

Table showing the results of enumeration of species contained in the sample plot.

Sl. No.	SEEDLING					COPPICE				REMARKS.
	Spp.	No.	ht.	dia	%	No.	ht.	dia	%	
1.	Gewa	290	15'	3"	59.18	-	-	-	-	<p>1. Area covered by grass, <u>Hibiscus</u> sp (bhola) and bushes of <u>Pandanus</u> sp is about 15%.</p> <p>2. Grass and <u>Hibiscus</u> sp were found mainly along the river bank.</p> <p>3. <u>Pandanus</u> sp was found along the fringes of water logged locations.</p>
2.	Sundri	131	10'	1 1/2"	26.33	-	-	-	-	
3.	<u>Tamarix</u> sp	3								
4.	<u>Pandanus</u> sp	7								
5.	<u>Ancor</u>	2								
6.	<u>Hibiscus</u> sp	12								
7.	<u>Singra</u>	32			16.49					
8.	<u>Goran</u>	5								
9.	<u>Passur</u>	3								
10.	<u>Roerix</u> sp	3								
11.	<u>Pongamia</u> sp	2								

## ABSTRACT

Area coverage in %	
Blank	Covered
15	85

Spp.	No.	%	Remarks
Gewa	290	59.18	- Dominant.
Sundri	131	26.33	- Co-dominant.
Misc.	69	16.49	- Suppressed.

Succession of Spp. in Sunderban

APPENDIX - A.

Serial No - 6.  
plot

Date of enumeration... 30-9-1970.

Range ... CHANDPAI.....

Local Name DHANGMARI.....

Comptt. No.... 31/A.....

Year of felling... 1963-64.....

Area of sample plot. 66' x 33'.

Table showing the results of enumeration of species contained in the sample plot.

S. No.	SEEDLING				COPPICE				REMARKS.	
	Spp.	No.	ht.	dia	%	No.	ht.	dia		%
1.	Baen.	14	13'-0"	2"	25.00	-	-	-	-	1. Phragmites sp. many. 2. One species of family Cyperaceae was found in abundance. 3. Pandanus sp bushes many. 4. Groop condition is poor.
2.	Sundri	9	7'-0"	1 1/2"	16.07	-	-	-	-	
3.	Gewa.	8	10'-0"	1"	4.29	2	-	-	100.	
4.	Sonai.	1	-	-	44.64	-	-	-	-	
5.	Bhola.	6								
6.	Borna.	17								
7.	choila.	1	20'-0"	4"-0"	-	-	-	-	-	

ABSTRACT

Area coverage in %	
Blank	Covered
40	60

Spp.	No.	%	Remarks
Baen	14	24.14	- Dominant
Gewa	10	17.25	- Codominant
Sundri	9	15.50	- suppressed
Misc.	25	43.11	- suppressed.

APPENDIX - A.Succession of Spp. in SunderbansSerial No - 7.  
Plot

Date of enumeration... 26-9-1970

Range ... SHARAN KHOLA ...

Local Name ... SUPOTI ...

Commt. No ... 5/13 ...

Year of felling ... 1964-65 ...

Area of sample plot ... 22' x 66' ...

Table showing the results of enumeration of species contained in the sample plot.

SEEDLING					COPPICE				REMARKS.
Spp.	No.	ht.	dia	%	No.	ht.	dia	%	
11. Gewa	1261	9'	1"	70.00					1. About 80% seedlings of Sundri are 1yr. old. 2. Baen, Passur and Sundri seedlings are coming up under shed of Gewa 3. About 80% seedlings of Gewa are 1yr old. Established seedlings of Gewa have an average height of 9'.
2. Sundri	262	—	—	14.60					
3. Goran	132	5'	75"	7.30					
4. Baen.	122								
5. Amoor	2			8.10					
6. Passur	14								
7. Jam.	8								

ABSTRACT

Area coverage in %	
Blank	Covered
X	100

Spp.	No.	%	Remarks
Gewa	1261	70.00	- Dominant.
Sundri	262	14.60	- coming under <sup>near</sup> growth.
Goran.	132	7.30	- Co-dominant.
Misc.	146	8.10	- Suppressed.

A P P E N D I X - A.

Succession of Spp. in Sunderban

Serial No-8.  
Plot

Date of enumeration... 29-9-1970

Range... KHULNA

Local Name... GANDARKHALI

Compt. No... 36/e

Year of felling... 1966-67

Area of sample plot... 65' x 66'

Table showing the results of enumeration of species contained in the sample plot.

Sl. No.	SEEDLING				COPPICE				REMARKS.	
	Spp.	No.	ht.	dia	%	No.	ht.	dia		%
1.	Gewa	515	3'-9"	1 1/2"	52.25	53	10'-6"	1 1/2"	50.88	1. Passur mostly one year old seedling. 2. Gewa Coppice is much healthier than other crop. 3. One Sundri seedling found to grow from a pneumatophore which was found to be wounded at the tip.
2.	Sundri	260	3'-2"	2/3"	26.37	13	7'-0"	1"	19.12	
3.	Goran.	3								
4.	Passur.	91								
5.	Khalshi.	25								
6.	Kankra.	54			21.40					
7.	Balu	35								
8.	Amor.	2								
9.	Keora.	1	20'	4 1/2"						

ABSTRACT

Area coverage in %	
Blank	Covered
50	50

Spp.	No.	%	Remarks
Gewa	570	54.08	- Dominant.
Sundri	273	25.92	- Codominant.
Misc.	211	20.00	- One Keora is much above the average crop.

Succession of Spp. in Sunderbans

APPENDIX - A.

- Serial No- 9.  
Plot

Date of enumeration... 25.9.70.....

Range .. SHARAN KHOLA .....

Local Name ..... SHANLA .....

Comptt. No..... 11/A .....

Year of felling.... 1966-67.....

Area of sample plot. 66' x 66'...

Table showing the results of enumeration of species contained in the sample plot.

SEEDLING					COPPICE				REMARKS.
Spp.	No.	ht.	dia	%	No.	ht.	dia	%	
1. Gewa	183	7'	2"	50.32	-	-	-	-	1. Thick grass all over. 2. Seedlings are subject to heavy deer browsing 3. Crop condition poor.
2. Sundri	170	5'	1/2"	46.88	-	-	-	-	
3. Amoor.	1	}	-	2.80	-	-	-	-	
4. Hibiscus sp	3				-	-	-	-	
5. Phoenix sp	1				-	-	-	-	
6. Goran	3				-	-	-	-	
7. Tamarix sp	1				-	-	-	-	
8. Tigerfern.	1	-	-	-	-				

ABSTRACT

Area coverage in %	
Blank	Covered
70	30

Spp.	No.	%	Remarks
Gewa	183	50.32	Dominant
Sundri	170	46.88	Codominant
Misc.	10	2.80	Suppressed.

APPENDIX - A.

Serial No - 10  
Plot

Date of enumeration.....28-9-70

Range .....KHULNA.....

Local Name ..NISHANKHALI.....

Commt. No.....16.....

Year of felling...1967-68.....

Area of sample plot. 23' x 66'

Table showing the results of enumeration of species contained in the sample plot.

S.	SEEDLING				COPPICE				REMARKS.
	Spp.	No.	ht.	dia	%	No.	ht.	dia	
1.	Gewa	117	4'-6"	1 2/3"	54.43	-	-	-	-
2.	Sundri	29	2'-0"	1"	13.61	1	6'	1 2/3"	100%
3.	Phoenix	20	}	}	31.44	-	-	-	-
4.	Goran.	39							
5.	Baen.	3							
6.	PASSUR.	1							
7.	Tigerfa	4							

ABSTRACT

Area coverage in %	
Blank	Covered
60	40

Spp.	No.	%	Remarks
Gewa	117	54.70	Dominant
Sundri	30	14.00	Suppressed
Misc.	67	31.30	Codominant

Succession of Spp. in SunderbansAPPENDIX - A.- Serial No - 11  
Plot -

Date of enumeration... 27.9.70.....

Range ..... CHANDPAI.....

Local Name <sup>dy</sup> .. CHOTOSIALA (Gewa Camp)

Comntt. No. .... 15.....

Year of felling... 1968-69.....

Area of sample plot... 66' x 66'..

Table showing the results of enumeration of species contained in the sample plot.

SEEDLING					COPPICE				REMARKS.
Spp.	No.	ht.	dia at base	%	No.	ht.	dia at base	%	
1. Gewa	460	5'	1 2/3"	64.31	4	6'	1 2/3"	12.90	1. 1 year old seedling of Sundri had 1'-9" long shoot & 2 9" long root. 2. 1 year old seedling of Gewa had 2'-5" long shoot and 4'7" long root. 3. Pneumatophores of Coppice Sundri - many & distributed all over. Height is 6"
2. Sundri	928	3'	1"	31.28	26	7 1/2'	1 1/4"	83.87	
3. Singra	5	-	-	-	-	-	-	-	
4. Baer	16	-	-	-	-	-	-	-	
5. Amoor	15	-	-	3.21	1	-	-	3.23	
6. Passur	14	-	-	-	-	-	-	-	
7. Govar	2	-	-	-	-	-	-	-	
8. Goal Pallo	3	-	-	-	-	-	-	-	

ABSTRACT

Area coverage in %	
Blank	Covered
60	40

Spp.	No.	%	Remarks
Gewa	464	31.50	- Dominant
Sundri	954	64.72	- Co-dominant
Misc.	56	3.79	- Suppressed

APPENDIX - A.

Succession of Spp. in Sunderbans

Serial No. - 12  
Plot

Date of enumeration... 29.9.70.....

Range ... KHULNA.....

Local name ... JAPHA.....

Compt. No. 37/C.....

Year of felling... 1969-70.....

Area of sample plot... 22' x 66'.....

Table showing the results of enumeration of species contained in the sample plot.

SEEDLING					COPPICE				REMARKS.
Spp.	No.	ht.	dia	%	No.	ht.	dia	%	
Gew	2808	11"	-	76.16					1. Baen seedlings two years old 2. Passur, Gew & Sundri seedlings one year old.
Sundri	90	1'-3"	1"	2.44					
Baen	435	2'0"	0.8"						
Passur	343	2'0"	-	21.40					
Kankra	3								
Goran	8								

ABSTRACT

Area coverage in %	
Blank	Covered
60	40

Spp.	No.	%	Remarks
Gew	2808	76.16	Co-dominant
Sundri	90	2.44	dominant
Misc.	789	21.40	Baen dominant

Succession of Spp. in SunderbansA P P E N D I X - A.Serial no. - 13  
Plot

Date of enumeration. 22.9.70.....

Range ... KHULNA.....

Local Name ..... JHALIA.....

Contt. No.....

Year of felling..... 1969-70.....

Area of sample plot... 33' x 66'.

Table showing the results of enumeration of species contained in the sample plot.

SEEDLING					COPPICE				REMARKS.
Spp.	No.	ht.	dia	%	No.	ht.	dia	%	
Gewa	5675	-	-	95.00	34	2'-9"	1 $\frac{2}{3}$ "	34.39	1. 1 year old seedlings of Gewa constitute 33% of total Gewa seedlings. 2. Coppice growth of govan is luxuriant. 3. Litter layer thick. 4. Water predominantly saline.
Govan	272	1'-6"	$\frac{1}{3}$ "	4.57	65	2'-8"	$\frac{2}{3}$ "	65.65	
Kankra	13	}	}	0.43					
Baen	7								
Keora	1								
Passur	5								

ABSTRACT

Area coverage in %	
Black	Covered
50	50.

Spp.	No.	%	Remarks
Gewa	5709	44.02	Co-dominant
Govan	337	5.55	dominant
Misc.	26	1.43	Suppressed

A P P E N D I X - A.Succession of Spp. in SunderbanSerial No- 14  
Plot

Date of enumeration... 29-9-1970.

Range ... KHULNA .....

Local Name ... FULTAHA .....

Compt. No. ... 35/E .....

Year of felling... 1964-65 .....

Area of sample plot 66' x 66' .....

Table showing the results of enumeration of species contained in the sample plot.

Sl. No.	SEEDLING				COPPICE				REMARK
	Spp.	No.	ht.	dia	%	No.	ht.	dia	
1.	Keora	35	28'-3"	4 1/2"	2.53	-	-	-	-
2.	Kankra	944	7'-1/2"	1/2"	68.31	-	-	-	-
3.	Passwr.	300	-	-	21.70	-	-	-	-
4.	Gewa.	5	-	-	-	14	-	-	32.36
5.	Amoor.	5	-	-	-	-	-	-	-
6.	Sundri	11	-	-	7.46	1	-	-	5.88
7.	Baen.	71	8'-8"	2"	-	2	-	-	11.76
8.	Khalshi	11	-	-	-	-	-	-	-

ABSTRACT

Area coverage in %	
Blank	Covered
20	80

Spp.	No.	%	Remarks
Keora	35	2.30	- Dominant.
Kankra	944	67.30	- Co-dominant.
Passwr	300	22.20	} Suppressed.
Misc	120	8.20	