

Feasibility of Underplanting in the Mangrove Plantations along the Eastern Part of Bangladesh

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Keora (*Sonneratia apetala* Buch.-Ham.) accounts for almost 95% of the successful mangrove plantations in the coastal areas of Bangladesh (RIMS 1997). In Chittagong coast, it constitutes 22% of the plantations. It is not much commercially valuable species. Moreover, the plantations are severely infested by a beehole borer, *Zeuzera conferta* (Baksha 1996). Replacement of *S. apetala* preferably by more valuable species that appear at later stages of succession is needed to ensure sustainability of the plantations. With this in view, underplanting trial in the established *S. apetala* plantations with different mangrove species was initiated. An interim report (Siddiqi *et al.* 1992) shows success and suitability of underplanting in western coastline

(Bhola and Patuakhali). This paper describes the performance of seven mangrove species planted in the established *S. apetala* plantation in eastern part of the shoreline.

Two trial plots (I & II) were established at Bhatarkhil under Sitakunda Range of Chittagong Coastal Afforestation Division in 1993 and 1994. Ten months old polybag-raised seedlings of seven mangrove species were planted at 1.2 m x 1.2 m spacing under the canopy of a 14 years old thinned *S. apetala* plantations in a Randomised Complete Block Design with three replications. The plots got regular inundation during monsoon, but in the winter the forest floor remained almost dry. Soil was silt clay loam, and water salinity on the forest

Table 1. Survival and height increment of mangrove seedlings one year after planting under a established *Sonneratia apetala* plantation at Sitakunda, Chittagong.

Species	Plot-I		Plot-II	
	Survival (%)	Height increment (cm)	Survival (%)	Height increment (cm)
<i>Heritiera fomes</i>	-	-	64.00 b	17.11 a
<i>Xylocarpus mekongensis</i>	81.00 a	16.71 a	78.00 a	14.81 a
<i>Excoecaria agallocha</i>	95.00 a	5.19 b	0.00 c	0.00 c
<i>Ceriops decandra</i>	86.00 a	13.69 a	35.00 c	11.22 a
<i>Bruguiera sexangula</i>	87.00 a	8.81 b	01.00 d	04.00 b
<i>Aegiceras corniculatum</i>	86.00 a	13.38 a	85.33 a	14.81 a
<i>Phoenix paludosa</i>	40.33 b	10.41 a	-	-

Figures followed by same letter do not differ significantly at 5% level. - Not planted.

Table 2. Comparison of performance of underplanted mangroves between eastern (Chittagong) and western (Bhola, Patuakhali) * coastline.

Species	Survival (%) after one year			Annual height(cm) increment		
	Chittagong	Bhola	Patuakhali	Chittagong	Bhola	Patuakhali
<i>Heritiera fomes</i>	64.07 ± 5.11	97	73	17.11 ± 1.75	09	36
<i>Xylocarpus mekongensis</i>	79.39 ± 3.83	99	73	15.76 ± 2.30	39	57
<i>Excoecaria agallocha</i>	47.53 ± 21.26	100	99	2.59 ± 1.23	73	97
<i>Ceriops decandra</i>	60.54 ± 11.90	97	71	12.45 ± 1.18	06	10
<i>Bruguiera sexangula</i>	43.85 ± 19.47	93	95	6.40 ± 2.20	09	15
<i>Aegiceras corniculatum</i>	85.64 ± 3.28	97	97	14.09 ± 1.21	24	70
<i>Phoenix paludosa</i>	40.32 ± 15.52	100	96	10.41 ± 1.64	57	32

*Data taken from Siddiqi *et al.* (1992).

floor varied between 5 and 35 ppt. Data on seedling survival and height increment were recorded at three months intervals.

The survival of seedlings at plot-I was good, but growth was unsatisfactory. Survival at plot-II was much low compared to plot-I. Like plot-I, seedling growth was unsatisfactory (Table 1). This ultimately resulted in the failure of the experimental plantations.

Table 2 indicates better performance of mangroves in the underplanting trials in the western coastline. Valuable species like *Excoecaria agallocha*, *Xylocarpus mekongensis* and *Heritiera fomes* appeared promising (Siddiqi *et al.* 1992). It was subsequently noticed that these species attained a height above 6/7 m in six years.

Chittagong coastal belt for many reasons are different from Bhola and Patuakhali. The plots

were subject to direct wave action. During dry season, the salinity was at sea level. Results of the present trial do not indicate feasibility of mangrove underplanting in the *S. apetala*

plantations in order to develop a second rotation crop in the eastern coastline. Further studies on various representative areas of Chittagong need to be undertaken.

References

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