

STATUS OF BIROL SAL FOREST IN NORTHWESTERN BANGLADESH

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Sal (*Shorea robusta* Gaertn.) forests have been a source of perennial supply of timber, fuel and various other products since time immemorial. Sal grows very tall and attains a height of about 35–45 m (Drury 1985) and girth of about 32 cm. Clean bole without branching could be found up to about 20 meters. Its branching system is good and strong. Its crown is conical in earlier stages and becomes round as it matures. It grows under an exceptionally wide range of climatic, geological and soil conditions and has the widest distribution of all dipterocarps (RAPA 1985). It grows well in a wide range of temperature with maximum shade temperature ranging from 32 to 47 °C and absolute minimum shade temperature from 1 to 7 °C. Normal rainfall ranges from 1016 to 572 mm per annum (Zabala 1988). Sal is confined roughly to 77–93 °E and 18–31 °N. Unlike other dipterocarps, sal is essentially a component of tropical moist deciduous forests, extending to the tropical dry deciduous forests.

Bangladesh has a total forest area of 2.46 million ha (17.4% of the total land area), out of which about 0.12 million ha (5%) are occupied by sal forests which are unevenly distributed in the relatively drier central and northern parts of the country, mostly in Dhaka, Tangail, Mymensingh, Dinajpur, Rangpur, Rajshahi and Comilla districts (Ismail & Mia 1973). This study was conducted at Birol sal forest in Dinajpur which lies in the north-western part of Bangladesh (88° 42'–89° E, 25° 18'N–25° 29'N). The forest covers 1104.5 ha. The annual rainfall is 1726 mm throughout the area. The topography of the land is generally flat with a gentle southwardly slope. The "Barind tract" is formed on the old alluvium of the pleistocene period. The general level of this tract is above flood level and intersected by numerous gentle depressions. The highest point in this tract does not exceed 20 feet above the surrounding land. For the study, 100 (10 × 10 m size) sample plots were taken using simple random sampling procedure. All the plots were in designated compartments (permanent management unit set by the forest department) which were under natural forest cover. During the survey, growth parameters, diameter (dbh, at an height of 1.3 m) and height were measured for all the trees having dbh above 5 cm. The collected data were compiled and computed to describe the conditions of the Birol forest.

Sal is the main species in Birol. It is mostly of coppice origin and comprises about 96% of the total tree population with 1353 trees per hectare. Despite the small acreage, this density is considerable compared to that of 300 trees per hectare in Kurseong or 1500 trees per hectare in Sikkim, India (Banerjee *et al.* 1989). The remaining 4% of the stock is composed of *Lannea coromandelica* (0.92%), *Semecarpus anacardium* (0.92%), *Phyllanthus acidus* (0.43%), *Hydrolea zeylanica* (0.35%), *Terminalia belerica* (0.29%), *Bombax ceiba* (0.14%) and a few other species as presented in Table 1. Gangopadhyay *et al.* (1990) reported *T. belerica*, *B. ceiba* and *Lagerstroemia parviflora* as common associates of coppice sal from West Bengal, India.

Different dbh classes were found dominated by different species (Table 1). *Shorea robusta* was predominant in 5–10 cm dbh range at 48.9%, in 10–15 cm dbh at 30.6% and 14% in 10–15 cm dbh classes. In the 20–25 cm dbh class, the dominant species was sal (2%)

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while two other species, jiga (*Lannea coromandelica*) and farash (*Lagerstroemia indica*), were in the same proportion (about 0.1%). Das (1977) also reported jiga as the species with the next highest density in Madhupur sal forest. In the highest diameter class (>30 cm) are found three species: sal, palash (*Butea monosperma*) and bhela (*Semecarpus anacardium*). Most of the trees (about 52%), 94.5% of which are sal, are in the 5–9.9 cm dbh class which indicates that the forest comprises mainly younger and immature trees. This coincides with the reports of Das (1977) and Prasad and Jalil (1987).

Table 1. Percentage distribution of each individual species in different dbh (cm) classes

Species	dbh classes (cm)						Total
	5–9.9	10–14.9	15–19.9	20–24.9	25–29.9	> 30	
<i>Shorea robusta</i>	48.87	30.63	14.00	1.90	0.14	0.14	95.68
<i>Butea monosperma</i>	-	-	-	-	-	0.07	0.07
<i>Phyllanthus acidus</i>	0.36	0.07	-	-	-	-	0.43
<i>Lannea coromandelica</i>	0.49	0.22	0.14	0.07	-	-	0.92
<i>Semecarpus anacardium</i>	0.64	0.14	0.07	-	-	0.07	0.92
<i>Terminalia chebula</i>	0.07	-	-	-	-	-	0.07
<i>Terminalia belerica</i>	0.22	0.07	-	-	-	-	0.29
<i>Bombax ceiba</i>	0.07	-	0.07	-	-	-	0.14
<i>Dillenia indica</i>	0.07	-	-	-	-	-	0.07
<i>Hydrolea zeylanica</i>	0.22	0.14	-	-	-	-	0.35
<i>Trewia nudiflora</i>	0.07	-	-	-	-	-	0.07
<i>Aegle mermelos</i>	0.07	-	-	-	-	-	0.07
<i>Ficus benjamina</i>	-	0.07	-	-	-	-	0.07
<i>Lagerstroemia indica</i>	-	-	0.07	0.07	-	-	0.14
Others	0.56	-	-	-	-	0.14	0.70
Total	51.71	31.34	14.35	2.04	0.14	0.42	100.00

Table 2 shows five mouzas (smallest administrative unit administered by the local government authority) that were covered to survey the Birol sal forest, viz. Ranipur, Kamdebpur, Dharmapur, Godabari and Dharmajoin with compartment numbers 83, 82, 87, 79 and 80 respectively. The average dbh, basal area per hectare, volume per hectare, volume per tree and stems per hectare were highest in compartment No. 83 while the lowest values were found in compartment No. 82. Compartment No. 79 showed above average number in terms of these parameters. It is also observed that younger trees of 05–9.9 dbh (cm) class are abundant in the study area and the species diversity is also higher in this lower diameter class (Figure 1).

Table 2. Compartmentwise stock parameters of Birol sal forest

Mouza (Compartment)	dbh (cm)	BA ha ⁻¹ (m ²)	Vol ha ⁻¹ (m ³)	Vol tree ⁻¹ (m ³)	Stems ha ⁻¹
Ranipur (83)	14.13	35.26	332.67	0.17	1900
Kamdebpur (82)	9.66	12.25	86.05	0.05	1450
Dharmapur (87)	9.72	14.74	120.73	0.07	1704
Godabari (79)	13.33	23.81	188.14	0.12	1541
Dharmajoin (80)	11.14	13.54	104.01	0.09	1130
Average	11.60	19.92	166.32	0.10	1545

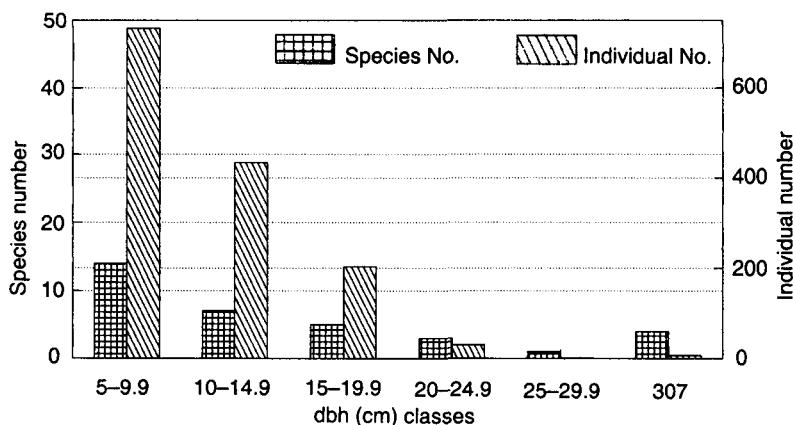


Figure 1. Percentage distribution of species and individuals in different dbh (cm) classes

Table 2 also indicates that compartments number 83 and 79 have higher levels of growth in terms of stems per hectare and basal area per hectare. The figures reveal that the species diversity is greater in compartments number 87, 82 and 80 but their basal areas are very low while stems per hectare are moderate. Thus, it can be inferred that these three compartments (87, 82 and 80) are composed of younger and immature trees, compared to compartments number 83 and 79. This alarming condition of Birol sal forest needs better management techniques to improve coppice regeneration of sal.

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