

HISTORY OF FOREST MANAGEMENT IN BANGLADESH

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Bengal, till the close of the nineteenth century, had paid little attention to forest conservancy and was still importing railway sleepers from Norway. Only in 1854 was Dr. T.A. Anderson, Superintendent Botanic Gardens Calcutta, appointed as Conservator of Forests Lower Provinces in addition to his own duties. Large forested tracts were at this time being cleared for cultivation. Although the British Government assumed the ownership of the Sunderban forest in 1828, no attempt was made to introduce forest conservancy for another half a century and in fact large leases were given during this period for clearing the forest and reclaiming land for cultivation (CHOUDHURY, 1968).

The forests of the Chittagong Hill Tracts had been under uncontrolled exploitation since early days and large-sized timber, and bamboos, were floated down the Karnafuli river to supply the Chittagong and other markets. Dacca, under the Moghul rule, was a great ship building centre and its timber supply was from the Chittagong Hill Tracts (STEBBING, 1921). The Chittagong Hill Tracts have since ancient times been inhabited by the Chakma, Mog, Murung, Tripura, and Lushai tribes who subsist on shifting cultivation ('jhuming'). They cut and burn the forests and sow rice, millets, vegetables, cotton, melons and tobacco by dibbling in patches and harvest the crops as they ripen. Every two to three years, as the soils get depleted, they move to another area, leaving their abandoned clearings to revert to forest.

According to Cowan (1923) the Chittagong Hill Tracts were made a district in 1860, and in 1862 toll stations were established on the rivers where duty was collected by the District Officer's staff on forest produce floated down to Chittagong. In 1869 an Assistant Conservator of Forests was appointed to select forests suitable for reservation. In 1871, 5,670 square miles of the district out of its total area of 6,882 square miles was constituted a Government forest. On April 1, 1871 the Forest Department took over the toll stations on the rivers. The marking hammers of wood cutters were then registered and they were prohibited from cutting trees below prescribed sizes. In 1871 teak was introduced from Burma at Sitapahar and Pahartali. The work at the latter site had soon to be abandoned due to damage by cattle.

Sir William Schlich, Conservator of Forests Bengal, visited these forests in 1875 and found that the hill tribesmen were free to cut and burn where they liked. A permit was required for exporting timber from the Hill Tracts and duty was collected on this timber at the toll stations which have already been mentioned. Schlich recommended the formation of two categories of forests:

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1. Reserved Forests, to be entirely under the control of the Forest Department where 'jhuming' and cutting of trees would not be permitted except with the permission of the Forest Department.
2. District Forests, where tribesmen would be allowed to practice 'jhuming' and to cut wood and bamboo for their domestic requirements under the control of the Deputy Commissioner. Export was also to be permitted subject to the imposition of minimum size limits for certain valuable species.

These proposals were approved by Government and by the end of 1875, 570 square miles of forest had been reserved.

In 1872, A.L. House, a forest officer working under Schlich visited the Sunderbans and described the prevailing conditions in the following words (STEBBING, 1923): "At present anyone who is so disposed trades in timber and firewood from all parts of the forests. The 'fakirs' who look after the spiritual wants of the wood cutters, and by the use of numerous charms and incantations do their best to protect their bodies from the tigers, in consideration of which services they receive a share in the value of the timber exported, have great influence with all classes of men who carry on the trade and may be said to be working the forests on their own account, as they point out the allotment in which timber is to be felled, and without the 'fakir's' countenance and protection no wood cutter will enter any allotment". Numerous tigers acted as a deterrent to over felling.

1900 to 1950

The forests of Chittagong Civil Division. The following account of the early history of forests in the Chittagong Civil Division is from Cowan (1923) who prepared the first working plan for these forests: Before the implementation of this working plan the usual practice was to cut the best trees from the most easily accessible areas. The lack of a large demand and difficulties of extraction prevented any large scale damage to the forests. The main threat had been from 'jhuming' and after reservation the forests were slowly recovering from the effects of this destructive practice. The extraction of bamboos was allowed to continue under permit—each householder living near Reserved Forests having the right to take out one head load of bamboo daily, for personal use or for sale. Because there was no restriction on the manner of cutting, this practice depleted the more accessible bamboo stands.

The experimental planting of teak in Sitapahar had been in progress on a small scale since 1871. In 1897 this plantation was seriously damaged by a cyclone—"at least 50% of the trees were up-rooted and, of the balance, the majority had their heads cut off" (COWAN, 1923). In 1909, the Chittagong Forest Division was split and another Division—the Chittagong Hill Tracts Forest Division created. In 1920, the forests lying in the Cox's Bazar Civil Sub-Division were constituted into the Cox's Bazar Forest Division. In the same year, 'taungya' plantations were started in Hazarikhel and Cheringa with 'gamar' (*Gmelina arborea*) as the principal species.

Working plans were introduced for the first time in 1923 in the Chittagong, Chittagong Hill Tracts, and Cox's Bazar Forest Divisions. All these were made by Cowan and were similar in broad outlines. They prescribed the constitution of two main working circles—the Timber, and the Bamboo. The Timber Working Circle included the best timber growing areas which were easily accessible. The principal object of management in this working circle was the production of valuable timber. Forests were to be felled and regenerated mainly by clear-felling and artificial regeneration, but natural regeneration could also be undertaken in suitable areas by burning shrubs, hoeing, or removal of mature trees from over existing advance growth. A rotation of 80 years was prescribed and during the 20 years working plan period (1923-1943) the areas allotted to P.B.I., totalling one fourth of the area of the working circle, were to be clear-felled and regenerated. The rest of the areas were to remain unallotted. Planting was to be carried out in pure patches of 20-25 acres. The main species recommended for planting were 'garjan' (*Dipterocarpus* spp), 'Chapalish' (*Artocarpus chaplasha*), 'gamar', 'toon' (*Cedrela toona*), 'jarul' (*Lagerstroemia speciosa*) and teak (*Tectona grandis*), depending on the site. Yield was regulated by area. In the unallotted portion of the working circle, only selection fellings would be carried out on 20 year's cycle to remove trees which were over-mature, or of defective stem form, or whose removal was likely to benefit better trees. To put a stop to un-regulated fellings, which had been the vogue so far in all forests, selection marking could only be done by the Divisional Forest Officer himself or by his competent assistant. Almost the whole area was to remain open to cutting and extraction of bamboo because it was not practicable at that time to enforce any restriction on this practice.

The Bamboo Working Circle comprised open forests where bamboo predominated, or forests from where the extraction of timber was then not practicable, owing to rivers being too shallow to float timber down, or for other reasons. The main object of managing these areas was to provide small timber and bamboo for local use. Trees were to be sold to individual applicants after being marked according to minimum girth limit requirements prescribed for the different species.

The prescriptions for the cutting of bamboo varied in the three working plans due to different conditions prevailing in the three Forest Divisions. In the Chittagong Division it was not considered practicable to introduce rotational cutting of bamboo and the only control sought was over the cutting of the culms of the previous rains. Conditions were more favourable in the Cox's Bazar and Chittagong Hill Tracts Divisions and their working plans prescribed a two and three year cutting cycle respectively.

Before the reservation of forests, the forests of Sylhet Forest Division were under extensive shifting cultivation, mainly of sugar cane (DAS, 1939). Forest reservation started in 1866. Upto 1903 the felling of trees was unregulated. Marking of trees before felling was started in 1903 and trees were sold to individuals on permit. From 1925 to 1938, the traders could cut any trees they liked subject to a minimum girth limit of 6 feet. The first working plan for Sylhet Forest Division was prepared by Das for the period 1938-48. It provided for the constitution of three working circles—Timber Working Circles 'A' and 'B' and Bamboo Working Circle.

The best timber forests were included in the Timber Working Circle 'A'. These were managed under the selection system—in which only marketable species above a prescribed girth limit were marked for felling, in addition to all dead, dying, and defective trees of the same species. Poorly stocked areas were to be regenerated by the 'taungya' method at the rate of about 400 acres annually.

To Timber Working Circle 'B' were relegated the poorer forests which were used to meet local demands for small timber. Trees were issued on permits and permit holders could fell the trees of their choice, subject to prescribed minimum girth limits.

Under the prescriptions of Cowan's working plans for the Chittagong, Chittagong Hill Tracts and Cox's Bazar Divisions clear-fellings were started at a number of sites, but it was soon realized that the market could not absorb all the timber cut and sufficient 'taungya' labour was not available for re-stocking the felled areas. Moreover Government policy at that time was to meet the local demand for timber from the scattered Protected Forests and to conserve the Reserved Forests for future use. In 1939, therefore, Cowan's working plans were abrogated (GHANI, 1955).

During World War II the demand for forest products suddenly shot up to meet the heavy requirement of the Army for timber and bamboos from all the accessible forests of these Divisions. In 1947 came the partition of the Indian sub-continent into Pakistan and India. With partition, the Eastern wing of Pakistan was cut off from the timber supplies of North Bengal. But demand for timber rose sharply, due to a sudden increase in construction and industrialization. There was also a keen demand for timber in the Western wing which could not be met from its internal resources. These changed conditions prompted the preparation of new working plans for the forests of these Divisions: a task which was undertaken by M/s Qudrat Ghani (Chittagong, Cox's Bazar) and A.S.M. Zahiruddin (Chittagong Hill Tracts).

The Sunderbans. The Sunderban forests were reserved in 1875 and 1876, the first working plan was applied to the area in 1893-94. It prescribed selection fellings using exploitable girth limits. The major concern was with 'sundri' (*Heritiera fomes*). Curtis (1931) prepared the first regular working plan for the forest after collecting considerable data on growing stock and rates of growth of the important tree species. The prescriptions of the plan, were however, found too elaborate to be practicable at the time and, from 1935 to the end of the period under review, the forests were managed under short-term schemes prepared from time to time, which were mostly modifications of Curtis's plan. The forests were managed under the selection system with different minimum exploitable girth limits prescribed for the different species of commercial importance (CHOUDHURY, 1968).

1950 to 1970

The Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet Forest Divisions. The working plans of Chittagong, Cox's Bazar and Sylhet Division for the period 1959-1970 were prepared by Qudrat Ghani and they all prescribed the constitution of three major working circles—Timber, Selection-cum-Improvement, and Bamboo (overlapping).

The Timber Working Circle comprised the better stocked areas from where extraction was economical and in which adequate labour was available for carrying out planting by the 'taungya' method. A conversion period of 100 years was laid down for clear-felling and planting the area. The working circle was divided into three periodic blocks: P.B.I., comprising one fifth of the area was to be clear-felled and regenerated in the plan period of 20 years. The existing plantations up to 1949 were grouped together into a Plantation Periodic Block. The rest of the area was left unallotted, to be subjected to selection fellings on a 20 year's cycle, along with similar fellings in the Selection-cum-Improvement Working Circle. In these fellings only those trees were to be removed which were not expected to survive till the next felling cycle. To provide forest products to the local villages and to ensure an adequate supply of labour, as well as close supervision of work, each Range was divided into a felling series which was further sub-divided into several cutting sections. Yield regulation was by area. Teak was the major species prescribed for planting on the slopes and 'jarul' in low lying areas. Other valuable indigenous species were also to be planted if suited to the site. Where sufficient 'taungya' labour was not available, attempts were to be made to aid existing natural regeneration by weeding and cleaning and gradual lifting of the overhead canopy.

In the Selection-cum-Improvement Working Circle were included areas where adequate 'taungya' labour was not available, or from where produce could not be extracted commercially. Here selection fellings were prescribed on a 20 year's cycle, using minimum girth limits as rough guides. Trees above these size limits could be retained if they had good stem form and were growing vigorously, while trees below these sizes could be removed, if it benefited the remaining crop.

The Bamboo (overlapping) Working Circle covered both the Timber and the Selection-cum-Improvement Working Circles. A cutting cycle of two years was prescribed for all bamboos extracted by river for commercial purposes. No restriction was imposed on the cutting of shoulder-borne bamboos for domestic consumption because it was not considered practicable.

The prescriptions of Zahiruddin's (1959) working plan for Chittagong Hill Tracts (1953-1972) varied slightly from the working plans mentioned above. His Conversion Working Circle I prescribed roughly the same treatment as Ghani's Timber Working Circle, except that his blocks of forests to be regenerated by 'taungya' were to be separated by five chains wide strips of indigenous forest which was to be regenerated by weeding and cleaning and gradual lifting of the overhead canopy.

His Conversion Working Circle II comprised areas of poor stocking where the objective was mainly to replace the existing forest growth by fully stocked plantations of valuable species, rather than the exploitation of the existing timber crop. The silvicultural system prescribed was clear-felling with artificial regeneration by 'taungya' as in Conversion Working Circle I, but the conversion period in this case was 80 years (as against 100 years for Working Circle I). The P.B.I. comprised one fourth of the area of the working circle. Zahiruddin also distinguished a Bamboo (overlapping) Working Circle. The cutting cycle in this case was three years as against Ghani's two years.

Within a few years of the commencement of these working plans a drastic change occurred in the then East Pakistan forestry picture. The planned development of the country started in 1955, giving rise to rapid development in both the public and private sectors which in turn created a large demand for construction timber in both wings of the country. A number of forest industries were established in East Pakistan for the manufacture of sawn timber, furniture, matches, pulp and paper, and veneer and plywood—several of them requiring fast growing timber species as raw-material. Simultaneously a vast increase in extraction facilities occurred, because the construction of the Karnafuli hydroelectric dam made timber floating possible in almost all streams traversing the Chittagong Hill Tracts while extraction from the forest to water courses was facilitated by the introduction of mechanical logging. All these developments revolutionised the pace of forest exploitation and the planting of new areas—for whereas only about 3,000 acres were cleared and planted annually during 1957-1959, ten years later the size of the annual coupe had increased to 19,000 acres. These radically changed conditions determined the main outlines of treatment for the new working plans to be prepared towards the close of the period under review: reduction of conversion period in the Timber Working Circle, institution of a Short Rotation Working Circle, and the abolition of the Selection-cum-Improvement Working Circle.

These new working plans were prepared by Choudhury (1969) for Cox's Bazar, Chittagong Hill Tracts North, and Chittagong Hill Tracts South Forest Divisions, and by Baten (1969) for Chittagong Forest Division.

All these working plans have the following features in common.

Three working circles have most commonly been distinguished: Long Rotation, Short Rotation, and Bamboo. The silvicultural system in the former two is clear-felling with artificial regeneration by 'taungya' or departmental working. For Chittagong, Chittagong Hill Tracts North and South, and Cox's Bazar conversion periods of 60 and 30 years have been prescribed for the Long and Short Rotation Working Circles respectively. For Sylhet, these periods are 80 and 40 years.

The Long Rotation Working Circle comprises areas of better site quality capable of growing valuable timber species economically to large sizes. These areas need not be easily accessible to markets because the high value per unit volume of the species to be raised in this Circle is expected to absorb the cost of transportation even from remote areas. Moreover means of communication are also likely to improve greatly during the sixty years which the trees will take to become marketable. The choice of species to be regenerated in this Circle is to be made according to site from valuable species capable of growing to large sizes, e.g., teak, 'jarul', 'garjan', 'chupalish', 'dhaki jam' (*Syzygium grandis*).

Those areas where timber crops can be grown to economic advantage only on comparatively short rotations are allotted to the Short Rotation Working Circle. Depending on site, fast growing species such as 'chatian' (*Alstonia scholaris*), 'kainjal' (*Bischofia javanica*), 'gamar', 'pitali' (*Trewia nudiflora*), 'kadam' (*Anthocephalus cadamba*), and 'minjri' (*Cassia siamea*) will be grown to supply timber to forest industries and to meet the local requirements of timber and firewood. Since the value per unit volume of these species is

comparatively low, the areas allotted to this working circle must be easily accessible to markets to justify their afforestation on economic grounds.

The cutting cycle for bamboo in all Divisions except Sylhet is 3 years. For Sylhet a cutting cycle of 4 years has been prescribed. In Chittagong Hill Tracts North and South, predominantly bamboo bearing areas are allotted to the Bamboo Working Circle. No separate working circle is distinguished for the bamboo growing as undergrowth in the Long and Short Rotation Working Circles, which is also to be exploited on a three year's cycle. In all the rest of the Divisions: Chittagong, Cox's Bazar and Sylhet, the Bamboo Working Circle overlaps the two timber working circles.

The Sunderbans Forest Division. An aerial forest inventory of the Sunderbans was completed by Messrs Forestal Forestry and Engineering International Limited in 1960. The current working plan for the Division (1960 to 1980) has been prepared by Choudhury (1968) from the data of this inventory. The working plan divides the forest into the Gewa (*Excoecaria agallocha*), Sundri, and Keora (*Sonneratia apetalla*) Working Circles.

The Gewa Working Circle covers the whole of the Sunderbans in Khulna District and is divided into three felling series—Matchwood, Newsprint and Miscellaneous, for supplying the matchwood factory, newsprint mill, and other local needs respectively. The silvicultural system prescribed is selection, with minimum exploitable d.b.h. of 6 inches in the Matchwood Felling Series and 4.5 inches in the other two. The felling cycle is 20 years and yield is regulated by area although allowable cut by volume has also been calculated by adding up the present standing mature volume of growing stock and half the growth during the felling cycle as estimated by stand table projection.

The Sundri Working Circle also covers the whole of the Sunderbans in Khulna District. The silvicultural system is Selection-cum-Improvement involving the removal of all dead, dying and defective trees and those which are above the minimum diameter limits prescribed. Thinning are also to be carried out in congested crops. The minimum exploitable diameter limits are 10.6 in., 8.6 in., and 6.6 in., for site qualities I, II and III respectively. The felling cycle is 20 years and yield is regulated by area.

The Keora Working Circle comprises scattered areas of 'keora' distributed all over Sunderbans, either as young pure even-aged stands, with no under-storey, occurring on new accretions, or as over-storey comprising scattered mature trees standing above well established 'sundri', 'gewa' or 'goran' (*Ceriops spp.*) regeneration. The treatment prescribed for pure 'keora' areas without an under-storey of regeneration is selection felling of trees with a minimum diameter of 12 inches and removal of dead and dying trees; for areas where scattered mature and over-mature trees of 'keora' occur over established regeneration of 'sundri', or 'gewa' or 'goran', clear-felling of 'keora'. Felling cycle is 20 years and yield is regulated by volume.

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