ASSESSMENT OF HABITAT TYPES AND FLORAL SPECIES IN TANGAIL, BANGLADESH AND DISPLAYED ON TO A MAP USING GIS

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Abstract

The habitats in the Mawlana Bhashani Science and Technology University (MBSTU) campus were divided into vegetation, water body and built area. Floral species assessed were classified as fruit and timber plants as well as cultivated crops and aquatic plants. Moreover, the data on habitats and floral species were displayed on to a map.

Key words: Biodiversity, MBSTU campus, Habitat, Floral species

Introduction

The term biodiversity means the variety of life within the environment that supports every living thing including the wide range of mammals, birds, reptiles, amphibians, fish, insects and other invertebrates, plants, fungi, and micro-organisms such as protists, bacteria and viruses. Bangladesh is one of the biodiversity-rich countries in the world and supposed to have 7000 endemic plant species (Ali and Ahmed 2001). An estimated 5,700 species of angiosperms alone, including 68 woody legumes, 130 fiber yielding plants, 500 medicinal plants, 29 orchids, three species of gymnosperms and 1700 pteridophytes have been recorded from Bangladesh (Firoz *et al.* 2004). However, there has been widespread degradation of habitats due to industrial development and large scale use of pesticides and insecticides in agriculture, the increased pollution load in estuaries, mangroves backwaters and seas. Therefore, conservation of biodiversity has become a major global concern although preservation of biodiversity is one of the critical difficulties in recent times particularly in Bangladesh.

Geographic information system (GIS) is an important tool for biodiversity conservation and distribution of habitats and vegetation types such as mangroves or riparian vegetation (Olivieri *et al.* 1995). So an attempt was made to assess the habitat type and floral species and their subsequent display on to the map of the district through GIS technology with a view to focus the congenial environment of Mawlana Bhashani Science and Technology University (MBSTU).

Materials and Methods

The information was collected using a questionnaire survey among 100 local people during July-October 2013 in the Mawlana Bhashani Science and Technology University (MBSTU), Tangail. Tangail is a district in central region of Bangladesh and is located at 24.2500° N and 89.9167° E.

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Map (Fig. 1) of the study area and some information have been obtained through the courtesy of Upazilla land office, Local Government Engineering Department (LGED) and Pourashava office.

Fig. 1. Map showing the Tangail Sadar Upzilla (Source: Banglapedia 2012).

Result and Discussion

Three types of habitats were classified in the campus area namely vegetation, water body and built area. The campus covered a total land area of 51 acres among which 11, 4.3 and 2.5 acres represent cultivable land, water body and grass land respectively. However, the remaining portion (33.2 acres) was occupied by woodland and built area.

The nature of vegetation is the fundamental attributes of landscapes of MBSTU campus area covering woodland, cultivated land and grassland.

Woodland is defined as vegetation dominated by trees more than 5m high when mature, although sometimes open, and includes canopy. In MBSTU campus area woodland is categorized as fruit and timber plants. Several types of fruit plants e.g. mango, jackfruit, litchi, lemon were noticed. The recorded timber plants species were Earleaf acacia, Mahogoni, Eucalypt, Silk cotton etc. The woodland provides habitat for some birds and animals (eg. squirrels, bat) as well as supports to maintain the ecosystem of the campus.

Several types of crops are grown in the cultivable area of MBSTU such as paddy, mustard and some vegetables.

Grassland refers to some small bare land in the MBSTU campus area. Some ornamental shrubs are found in the edge of the buildings.

The water bodies in the campus area are composed of four small ponds and one large dighi. The dighi is known as Shahjaman Dighi and is located in front of the campus Administration Building. A cannel is flowing along the campus boundary. These ponds are the habitats of some aquatic plants such as water hyacinth, duck weed, water primrose and water morning glory as well as a variety of fish and micro-organisms. Nevertheless, most of these species change their attributes at different time of the year with seasonal change. During this research approximately 1.5 acres of water habitat were occupied by aquatic plants. Therefore, in order to manage these habitats different strategies are required and these ponds should be incorporated into the grounds management plan of the University for Research purposes. These ponds can also be used as a focus of the university landscape and of recreational value. However, currently these ponds and cannel are going to be polluted by anthropogenic activities resulting a negative impact on existing native species and ecology.

Built area refers to the places which have been developed for human use. These include buildings, roads, settlement etc. There are several types of buildings such as academic building, administration building and hall of residence.

The digitized habitat map was analyzed to determine the extent of each of the different habitat types. The floral species were enumerated. The numbers were 341 among which 238 and 103 were fruit and timber plants respectively.

Most of the study area is covered by woodland and cultivated area along with some waterbody, herb land and small quantity of grassland (Fig. 2).
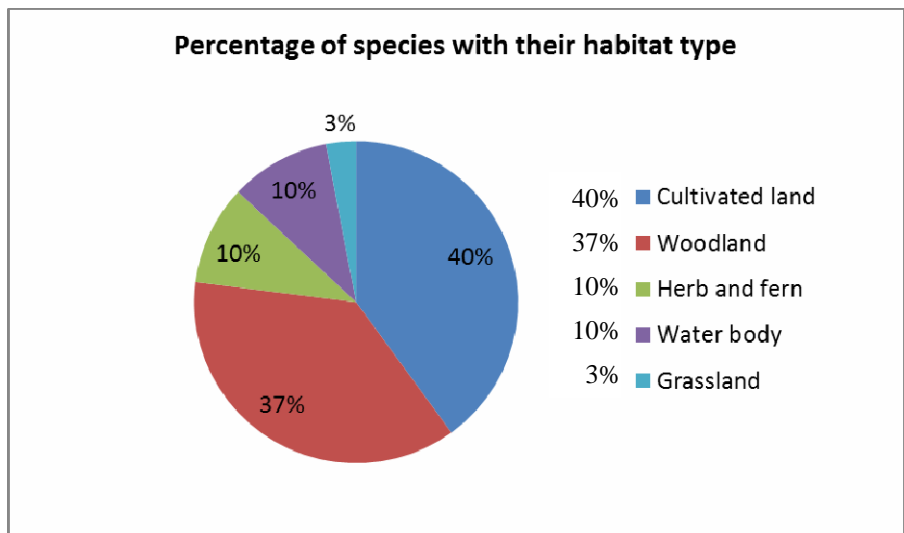

Fig. 2. Representation of the percentage of species with their habitat type.

There are total 238 different types of fruits species at MBSTU campus. The percentage of mango trees was the highest whereas that of litchi trees was the lowest (Table 1). The values were

30 and 4%, respectively. Jackfruit tress occupied about quarter percentage of total fruit plants of the survey area. In addition, the table demonstrates that the recorded number of timber plants of MBSTU campus was 103 which include Akashmoni, Mahgoni, Eucalypt, silk cotton and bamboo trees. The highest percentage of tree species was accounted by Mahgoni (25%) whereas Akashmoni represented the second highest percentage (22%) and the percentage of silk cotton tree was the lowest (8%).

Table 1. Enumeration of fruit and timber plants.

Sl.	Local name	English name	Scientific name	No. of species	Percentage
Fruit plants					
1	Aam	Mango	*Mangifera indica*	71	30
2	Kathal	Jackfruits	*Artocarpus heterophyllus*	59	25
3	Peara	Guava	*Psidium guajava*	12	5
4	Jaam	Berry	*Syzygium cumini*	17	7
5	Supari	Betel nut	*Areca catechu*	24	10
6	Lebu	Lemon	*Citrus limon*	12	5
7	Lichu	Litchi	*Litchi chinensis*	9	4
8	Kola	Banana	*Musa acuminate*	17	7
9	Others	-	-	17	7
Timber plants					
1	Akashmoni	Earleaf acacia	*Acacia auriculiformis*	23	22
2	Eucalypt	Eucalyptus	*Eucalyptus camaldulensis*	19	18
3	Mahogany	Mahogany	Swietenia macrophylla	26	25
4	Shimul	Silk cotton tree	*Bombax ceiba*	8	8
5	Bash	Bamboo	*Bambusa bambos*	12	12
6	Others	-	-	15	15

People who live in the surrounding of MBSTU campus are used to keep themselves involved in agricultural practices. Among different types of crops more than half of the cultivated crop was paddy (Table 2). It was 55% of total cultivated crops and was the highest amount of cultivable species. The percentage of potato, mustard, and bottle gourd accounted 15, 9 and 4%, accordingly. Moreover, the highest percentage of aquatic plant was covered by water hyacinth; the figure was 35% whereas some unknown plant species represented only 4% (Table 2). It is well documented that both water hyacinth and duck weed are good for natural water purification treatment.

There were some common types of medicinal plant species in the area. They were Arjun (*Terminalia arjuna*), Helencha (*Jussiaea repens*), Dholkalmi (*Ipomoea fistulosa*), Tulsi (*Ocimum sanctum*), Thankuni (*Centella asiatica*) and Akanda (*Calotropis gigantea*).

Table 2. Enumeration of cultivated crops and aquatic plants.

| Sl.	Local name	English name	Scientific name	Covered area (Acr)	Percentage
Cultivated crops					
1	Dhan	Paddy	*Oryza sativa*	6.05	55
2	Aalu	Potato	*Solanum tuberosum*	1.65	15
3	Sorisha	Mustard	*Brassica nigra*	0.99	09
4	Mula	Radish	*Raphanus sativus*	0.77	07
5	Lau	Bottle gourd	*Lagenaria siceraria*	0.44	4
6	Others	-	-	1.10	10
Aquatic plants					
1	Kachuripana	Water hyacinth	*Eichhornia crassipes*	0.53	35
2	Khudipana	Duck weed	*Lemna minor*	0.37	25
3	Kalmilata	Water morning glory	*Ipomoea acuatica*	0.27	18
4	Dholkalmi	Bush morning glory	*Ipomoea fistulosa*	0.09	6
5	Helencha	Water primrose	*Jussiaea repens*	0.18	12
6	Others	-	-	0.06	4
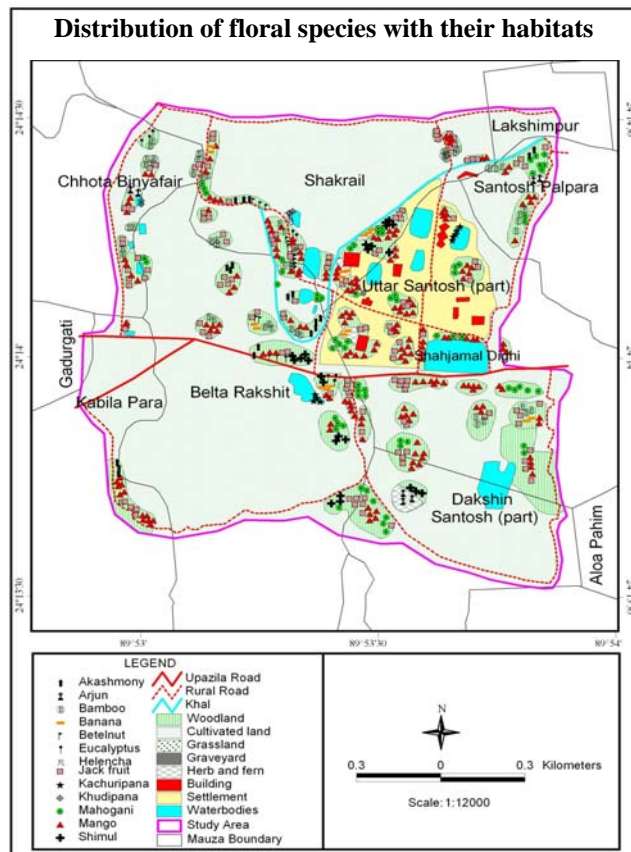
Fig. 3. Map showing the distribution of floral species with their habitats.

Conclusion

MBSTU campus and its surrounding area is rich in biodiversity and has potent influence on environmental, social, recreational, economical and ecological dimensions. Therefore the area needs to be preserved because of its multidimensional significance.

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