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# Homestead plant diversity in the south-central coastal saline region of Bangladesh: utilization and conservation

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**Abstract**

*The present study has found a total of 189 plant species belonging to 152 genera and 74 families growing in homesteads in the south-central coastal region of Bangladesh. Despite variation of species diversity was found in different saline zones the highest numbers of species were recorded in moderately saline zone. Distribution of existing plant species were recorded as 67.20% trees and 32.80% were woody, non-woody and climber types. The family Euphorbiaceae followed by Poaceae and Fabaceae represented highest number of species. On an average, 181 species existed per homestead. Distribution of species in different saline zones varied and it was highest in less saline zone (37.16%) followed by strongly saline (32.55%), and moderately saline (30.29%) zones. The most prevalent timber tree species are Albizia richardiana, Swietenia macrophylla and Samanea saman. Adaptation of different species in various saline zones widely varied due to different levels of salinity while Cocos nucifera as fruit species was almost equally dominant in all saline zones. The diversity indices of different categories of plant species varied in various saline zones. Diversity of timber-yielding species in all the saline zones was higher than fruit-yielding species along with other species because of rapid economic return and diversified purposes such as fuel wood, pole and timber. Prevalence value of good number of species decreased at a very low level may be considered as gradually decreasing from homesteads of this region. Species need to preserve in the homesteads through in-situ conservation measure.*

## Introduction

Bangladesh is endowed with a rich of plant resources. A recent study (Ahmed *et al*., 2009) estimated amounting 3,611 flowering plants species in Bangladesh. Islam *et al*. (2013) identified 32 fruit yielding and 37 timber tree species in the coastal region. However, this rich plant diversity in Bangladesh is on the verge of rapid decline, because of rapid depauperation of different species through natural and manmade processes. Forest land being the best home of plant diversity is under severe threat. Although forest land is 17% of the total land area of the country, but actual tree coverage has been depleted due to massive human interferences (BBS,2012). Similarly, farm lands where innumerable cultivars along with many crops varieties are grown with association of domestic animals and feeding habitats historically are on reducing

trend because of intensive land use, natural disasters, human and manmade interventions with use of high input-based technologies. As a result, the country once endowed with diversified plant species has already being lost some of them or are in the process of extinction. Some common and uncommon species are gradually decreasing which is alarming. The Red Data Book (Ara *et al*. 2013) of vascular plants of Bangladesh listed 120 plant species which faces threats in varying degree. The loss or degradation of every single species which deplete biodiversity ultimately affects the ecological balance and food security of a community.

Homestead is the most important natural resource base in Bangladesh containing a large number of diversified plant species. Some of these plant species are called "life supporting species" because these species in the homesteads play a vital role for the livelihood of the people, especially during food scarcity or natural disasters in the rural areas. There are over two and half millions of homesteads in Bangladesh of which about 94% are in the rural areas (BBS, 2005). Unfortunately, these resources are under tremendous pressure due to various human activities and frequent natural calamities. Species richness or plant diversity varies from place to place, largely influenced by ecological and socio-economic factors. Coastal region, especially the south-central part of Bangladesh is lying across the Bay of Bengal is bio-ecologically ever dynamic and enriched by homestead plant resources. However, recurring threats of disasters are the major constraints that commonly break down the coastal ecosystems, specially threatening both the flora and fauna of these areas. As a ready reference devastating super Sidr, 2007 and Aila 2009 damaged growing plants of this coastal region. Homestead of this region is comparatively medium or larger in size and holding numerous vegetations. Majority of the people of this region greatly depend on their homesteads, because most of the arable lands are low and suffer from salinity problem. On the other hand, drought in the southern region seriously affected homestead vegetations. Miah and Bari, 2001 showed that both number and productivity of homestead plantations, particularly sweet water-loving fruit species (*Spondias pinnata, Manilkara zapota, Areca catechu, Phoenix sylvestris etc*) are declining due to increasing soil salinity. On account of human activities and poor management strategies, many plant species of the region are decreasing trend. Unfortunately, there was little study on the existing homestead species resources for management and conservation, especially in the southern-central coastal region of Bangladesh. A comprehensive study was undertaken to collect systematic information on plant resources and to make necessary recommendations to sustain or enrich the homestead plant diversity as a prime source of food and livelihood support. The objectives of the present study are three-folds: i) to assess and document the status of species diversity in the homesteads of varying saline zones of the south-central coastal region of Bangladesh; ii) to find out the relative prevalence and biodiversity indices of growing plant species and iii) to trace out the conservation strategies for plant biodiversity regeneration in the south-central coastal region of the country.

**Materials and methods**

Field surveys have been conducted in Patuakhali and Borguna districts under Barisal division of south-central coastal region of Bangladesh contiguous to the Bay of Bengal. These two districts lie between $21^0$40' and $32^0$36' N latitude and between $89^0$51' and $90^0$ '40' E longitude. Patuakali and Barguna districts have a total area of 3,221 and 1,831 sq. km. with a total population of 1536000 (BBS, 2011). These two districts covered 3.42 % of the total area of Bangladesh. The average size of household of these two districts was 4.41 and 4.12, respectively. This coastal tidal flood plain area enjoys a number of diverse ecosystems. Tidal Flood plain constitutes about 49% of the coastal areas (SRDI, 2000). The ecosystems of the coastal zone are delicate, dynamic and complex. Influencing factors of the ecosystems of the study are sea surge and waves, salinity intrusion, tides, water-logging, sedimentation, unplanned discharge and accretion etc. Coastal saline

area of the south-central region has been gradually increasing. However, small-scale variation of physical, biological and socio-economic factors can also contribute enormously on plant diversity and cropping intensity considerably from the non-saline areas.

The study was carried out in three upazillas Bauphal, Amtoli, and Kalapara under two peripheral districts Patuakhali and Barguna. They were selected based on the level of salinity i.e., strongly saline, moderately saline and less saline sites. Kalapara was highly-saline site (salinity ranged from 12.1 to 16.0 dS/m. or > 16.0 dS/m), Amtoli was moderately saline site (salinity ranged from 8.1 to 12.0 dS/m), and Bauphal less saline site (salinity ranged from 2.1 to 8.10 dS/m). It was found that the strongly-saline area covered 75% area of Kalapara upazila and the less-saline area covered 17% area of Bauphal Upazilla of Patuakhali district. Similarly, moderately-saline area of Amtoli upazila covered 64% area of Barguna district (SRDI, 2000).

Out of these three upazillas, one union and one village from each upazilla were selected as sampling areas. The selected unions were Latachapali (Kalapara), Karaibaria (Amtoli) and Kalisuri (Bauphal); and three villages were Nayapara, Choulapara and Kalisuri, respectively. The selected villages were encompassed at least one canal or a small river. The total households of Nayapara, Choulapara and Kalisuri were 157, 209 and 305, respectively. In total, 36% of proportionate sample was drawn from the total population size 671. The proportionate distribution of sample households were Marginal 131 (35%), Small 330 (29%), Medium 160 (34%) and Large 50 (60%). Size of total sample of study was 240 of which 80 samples were drawn from different household for each location. A structured questionnaire was prepared to collect the required data. Participatory survey including enumeration and household data collection and discussion meetings conducted for data collection.

To indicate the importance and richness of different plant species in the study areas, relative prevalence (RP) of species was calculated as follows:

RP = Population of the species / homestead X % homesteads with the species.

Relative prevalence of all types of trees was calculated by using the above formula.

Simpson's Species Diversity Index (D).

$$D=1-\sum_{i=1}^{S}(Pi)^2$$

Where $P_i$ is the proportion of total individuals in the $i^{th}$ species.

$P_i = n/N$, n is the number of individuals in the $i^{th}$ species and N is the total number of the individuals of all species in the community, D=Diversity index number, ∑= is a summation sign, S=Total number of species, D can range from 0 to1.

Equitability means equality or evenness. Diversity index depends on richness and equitability. Equitability can itself be quantified by expressing Simpson's diversity index (D) as a proportion of maximum possible value D would assume if individuals were completely evenly distributed among the species.

In fact, D max = S

The Equitability,

$$E=\frac{D}{D\ max}$$

$$=\frac{1}{s}\times\frac{1}{s}$$

$$\sum_{i=1} pi^2$$

$$= \frac{D}{S}$$

Equitability assumes a va1ue between 0 and 1.

## Results and Discussion

### Plant species diversity

A total of 189 growing plant species were found from 240 homesteads of 3 study sites i.e., less saline, moderately saline and strongly saline areas (Table-1). The number and kind of plant species grown in the three sites varied 189 species in moderately saline area, followed by 167 in strongly saline area and 173 in less saline areas. Out of 189 plant species recorded, trees (timber, fruit, medicinal, ornamental and naturally growing) were represented by 67.20%, while herbs and shrubs were represented by 32.80%. Similarly, Alam and Masud (2005), Millat-e-Mustafa and Haruni (2002) identified a total of 142 species and 162 species from homestead, respectively. These available growing tree species (excluding herbs/shrubs and non-countable plants) are listed in Appendix-1 including their English, scientific names along with their relative prevalence value. The highest number distributed in the moderately-saline area was fruit-yielding species (40) followed by timber and fuel wood (36), medicine and spices (17), ornamental (20), naturally growing (14) and other plant species. A few number of plant species were totally disappeared in less saline area such as Sundri (*Heritiera fomes*). This variation in different saline zones may be multipurpose species along with some other saline loving fruit-yielding and timber-yielding species were found to grow well in saline ecosystem.

The study find out species diversity and richness is relatively higher than other parts of the region. The large number of different plant species found in the south-central coastal region of Bangladesh showed richness of plants in terms of organismal diversity. This could be due to these region enjoys rich as well unique ecosystem and tidal sediments which is influencing factor of rich plant diversity.

**Table-1.** Homestead plant species in different salinity zones of the studied south-central coastal areas of Bangladesh.

| Homestead plant species | Different saline zones of the study areas | | |
|---|---|---|---|
| | Less saline | Moderately saline | Strongly saline |
| Timber and fuel-yielding | 32 | 36 | 34 |
| Fruits-yielding | 39 | 40 | 40 |
| Medicinal and spices | 15 | 17 | 14 |
| Ornamental | 16 | 20 | 13 |
| Naturally-growing | 13 | 14 | 14 |
| Woody,nonwoody (herbs/shrubs/climbers) | 58 | 62 | 52 |
| Total | 173 | 189 | 167 |

### Systematic arrangement of plant species

The identified plants were systematically classified according to their species, genera and families are given in Table-2. The available growing plant species were belonged to 74 families, 152 genera and 189 species which included a wider range of diversity of dicot and monocot plants. Similarly, Arefin *et al*. (2011) identified 72 families and 183 genera under from the Satchari National Park. It was found the family, Euphorbiaceae represented by the highest 9 genera and 10 species, followed by Poaceae (8 genera and 9 spp) and Fabaceae (6 genera and 8 spp) are mark as the major families in the study sites.

**Table-2**. Systematic arrangement (families, genera and species) of the homesteads plant species of the studied areas of the south-central coastal region of Bangladesh.

| Family | Genus | Species | Family | Genus | Species | Family | Genus | Species |
|---|---|---|---|---|---|---|---|---|
| 1 Acanthaceae | 3 | 3 | 26 Crassulaceae | 1 | 1 | 51 Myrtaceae | 3 | 6 |
| 2 Amaranthaceae | 3 | 3 | 27 Cruciferae | 1 | 1 | 52 Nyctaginaceae | 1 | 1 |
| 3 Amaryllidaceae | 1 | 1 | 28 Cucurbitaceae | 1 | 1 | 53 Oleaceae | 1 | 1 |
| 4 Anacardiaceae | 3 | 4 | 29 Cyperaceae | 2 | 2 | 54 Pandanaceae | 1 | 1 |
| 5 Angiopteridaceae | 1 | 1 | 30 Dilleniaceae | 1 | 1 | 55 Poaceae | 8 | 9 |
| 6 Annonaceae | 2 | 3 | 31 Dioscoreaceae | 1 | 2 | 56 Polygonaceae | 1 | 1 |
| 7 Apiaceae | 1 | 1 | 32 Ebenaceae | 1 | 2 | 57 Pontederiaceae | 1 | 1 |
| 8 Apocynaceae | 4 | 4 | 33 Elaeocarpaceae | 1 | 1 | 58 Portulacaceae | 1 | 1 |
| 9 Araceae | 1 | 1 | 34 Euphorbiaceae | 9 | 10 | 59 Punicaceae | 1 | 1 |
| 10 Arecaceae | 6 | 7 | 35 Fabaceae | 6 | 8 | 60 Rhamnaceae | 1 | 1 |
| 11 Asclepiadaceae | 2 | 2 | 36 Flacourtiaceae | 1 | 1 | 61 Rosaceae | 2 | 2 |
| 12 Asteraceae | 2 | 2 | 37 Flagellariaceae | 1 | 1 | 62 Rubiaceae | 5 | 5 |
| 13 Averrhoaceae | 1 | 1 | 38 Lamiaceae | 1 | 2 | 63 Rutaceae | 3 | 7 |
| 14 Bignoniaceae | 2 | 2 | 39 Lauraceae | 2 | 3 | 64 Sapindaceae | 2 | 2 |
| 15 Bombacaceae | 2 | 2 | 40 Lecythidaceae | 1 | 1 | 65Sapotaceae | 2 | 2 |
| 16 Boraginaceae | 2 | 2 | 41 Liliaceae | 2 | 2 | 66Scrophulariaceae | 1 | 1 |
| 17 Brassicaceae | 1 | 1 | 42 Lythraceae | 1 | 1 | 67 Solanaceae | 2 | 2 |
| 18 Bromeliaceae | 1 | 1 | 43 Magnoliaceae | 1 | 1 | 68 Sonneratiaceae | 1 | 2 |
| 19 Caesalpiniaceae | 4 | 4 | 44 Malvaceae | 2 | 3 | 69 Sterculiaceae | 2 | 2 |
| 20 Cannaceae | 1 | 1 | 45 Marantaceae | 1 | 1 | 70 Tiliaceae | 1 | 1 |
| 21 Casuarinaceae | 1 | 1 | 46 Meliaceae | 5 | 6 | 71 Typhaceae | 1 | 1 |
| 22 Chenopodiaceae | 1 | 1 | 47 Menispermaceae | 1 | 1 | 72 Verbenaceae | 5 | 6 |
| 23 Clusiaceae | 2 | 2 | 48 Mimosaceae | 6 | 10 | 73 Vitaceae | 1 | 1 |
| 24 Combretaceae | 1 | 4 | 49 Moraceae | 3 | 8 | 74 Zingiberaceae | 2 | 4 |
| 25 Convolvulaceae | 2 | 3 | 50 Moringaceae | 1 | 1 | Subtotal =24 | 49 | 61 |
| Sub total =25 | 50 | 57 | 50 | 53 | 71 | Grand total =74 | 152 | 189 |

**Species composition**

Species composition i,e number of individual tree species were recorded in homestead on the basis of salinity level is shown in Table-3. On an average, about 181 individual tree of different ages species existed per homestead which was encouraging in terms of number of plants regard of homesteads space utilization. The highest number (201) of trees existed per homestead in less saline zone, followed by 176 in highly saline zone and 164 in moderately saline zone. In the less-saline zone, multipurpose trees species were grown dominantly because the species were adapted there. Even some fruit-yielding and timber-yielding

species were found to grow well in less saline zones of the study areas. Besides naturally growing trees species found in higher number in less saline area compared to that of moderate and strongly saline area. A uniform distribution of tree species across the coastal region could be useful for fruit and timber production special attention to saline affected area of this region.

**Table-3**. Tree composition per homestead on the basis of salinity level in the studied areas of the south-central coastal region of Bangladesh

| Tree species | Number of tree species/homestead of different saline zones | | | Species/ Homestead |
|---|---|---|---|---|
| | Less saline | Moderately saline | Strongly saline | |
| Timber-yielding | 122.28 | 92.14 | 97.90 | 104.10 |
| Fruit-yielding | 74.26 | 66.41 | 71.66 | 70.78 |
| Medicinals | 1.15 | 3.29 | 3.41 | 2.62 |
| Ornamentals | 0.86 | 1.16 | 1.05 | 1.03 |
| Naturally-growing | 2.71 | 1.08 | 2.28 | 2.02 |
| Total | 201.26 | 164.08 | 176.30 | 180.55 |

**Homestead tree distribution in different saline zones**

Tree distribution in different saline zones of the study areas is presented in Figure-1. Individual trees existed in the homesteads in different saline zones are distributed as strongly saline (32.55%), moderately saline (30.29%) and less saline (37.16%), respectively. Figure shows that high volume of species distributed in less saline zone may be the seedling survivability was higher compared to other zones of the study areas. It was reported by the respondents, in saline areas during dry season tender aged seedling damaged due to high salinity in dry season and high tide in rainy season. Therefore, saline tolerant tree species need to be planted in moderate to strongly saline zones.

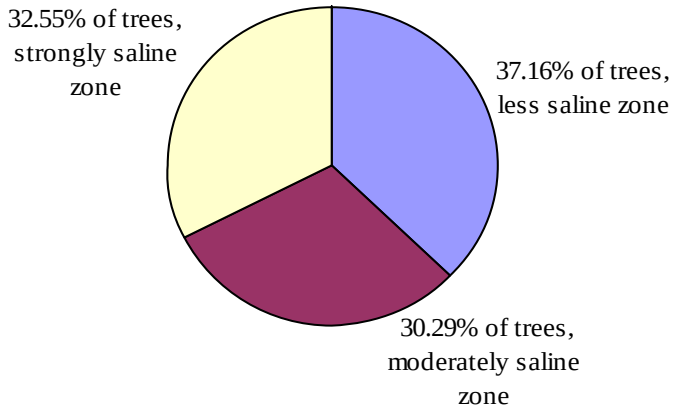


**Figure-1.** Homestead tree distribution in different saline zones of the study areas of the south-central coastal region of Bangladesh.

**Relative prevalence of tree species**

The most prevalent and top ranked growing tree species of different categories in varying saline zones are presented in Table-4. The variation in number of species and variation among the categories (timber-, fruit-, medicinal and spice-yielding, ornamental and naturally growing) of tree species in the homesteads is very unbalanced. Relative prevalence of other indigenous and local species was found to be very poor. Available growing tree species have prevalent value are listed in Appendix-1 (not included herb, shrub and non-countable species), with their relative prevalence value. This is an indication of diminishing trend of

homestead plant biodiversity in terms of number of different local and indigenous fruit, medicinal and naturally growing trees. Only a few top prevalent species such as Mahogony, Chambol and Raintree are being replaced by other important plants from the homesteads. This is an alarming and an indication of valuable local common species erosion from the homesteads.

However, the south-central homesteads were observed to be rich in fruit-yielding species, but the relative prevalence of species showed that indigenous species have gradually been decreased. Therefore, it is essential to promote policy guidelines and motivate the farmers to maintain a combination of species to grow the indigenous but low cost fruit-yielding species and other varieties to boost-up diverse floral genetic base in the homesteads.

**Table-4.** Relative prevalence of dominant tree species in varying saline zones of the south-central coastal region of the study of Bangladesh.

| Species/Scientific name | English/ Common name | Relative prevalence | | | Total | | |
|---|---|---|---|---|---|---|---|
| | | Lees saline | Moderately saline | Strongly saline | Average trees | % of homesteads with the species | RP all farm |
| 1) Timber-yielding | | | | | | | |
| *Albizia richardiana* | Chapalish | 36.516 | 21.595 | 26.130 | 31.56 | 0.89 | 28.01 |
| *Swietenia mahagoni* | Mahogany | 51.989 | 15.397 | 16.350 | 32.33 | 0.83 | 26.67 |
| *Samanea saman* | Rain tree | 16.718 | 25.686 | 25.547 | 24.41 | 0.93 | 22.68 |
| 2) Fruit-yielding | | | | | | | |
| *Mangifera indica* | Mango | 10.620 | 7.678 | 14.144 | 11.92 | 0.91 | 10.88 |
| *Cocos nucifera* | Coconut | 11.282 | 8.892 | 9.901 | 11.08 | 0.91 | 10.06 |
| *Phoenix sylvestris* | Date palm | 10.199 | 10.766 | 1.740 | 8.92 | 0.78 | 6.98 |
| 3) Medicine-yielding | | | | | | | |
| *Terminalia arjuna* | Malabar nut | 0.030 | 0.002 | 0.021 | 0.16 | 0.10 | 0.015 |
| *Calotropis gigantea* | Swallow wort | 0.020 | 0.007 | 0.000 | 0.10 | 0.06 | 0.006 |
| *Azadirachta indica* | Neem | 1.478 | 2.040 | 0.065 | 1.91 | 0.49 | 0.938 |
| 4) Ornamental species | | | | | | | |
| *Hibiscus rosa-sinensis* | China rose | 0.0183 | 0.0506 | 0.0600 | 0.23 | 0.18 | 0.0411 |
| *Delonix regia* | Gulmohur | 0.0127 | 0.0077 | | 0.07 | 0.07 | 0.0044 |
| *Nyctanthes arbor-tristis* | Jasmine | 0.0002 | 0.0025 | 0.0025 | 0.04 | 0.04 | 0.0014 |
| 5) Naturally growing | | | | | | | |
| *Streblus asper* | Rough bush | 0.152 | 0.005 | 0.425 | 0.61 | 0.23 | 0.138 |
| *Barringtonia acutangula* | Indian oak | 0.011 | 0.001 | 0.069 | 0.19 | 0.09 | 0.018 |
| *Hydnocarpus kurzii* | Chaulmoogra | 0.040 | 0.017 | 0.038 | 0.23 | 0.13 | 0.031 |

**Relative prevalence variation of major species**

Relative prevalence of major timber-yielding and fruit-yielding trees in varying saline zones is presented in Figure-2. It was observed that Chambol (*Albizia richardiana*), and Mahogany (*Swietenia mahagoni*) were highly dominant in less saline areas but Raintree (*Samanea saman*) was dominant in moderately and strongly saline areas. In case of fruit-yielding species, Mango (*Mangifera indica*) was prevalent in highly saline areas; while Coconut (*Cocos nucifera*) was almost equally dominant in all the saline zones of the study areas. However, Date palm (*Phoenix sylvestris*) was less dominant in highly saline areas compared to moderately and less saline areas. Tamarind (*Tamarindus indica*) was performed well here in moderate and strongly saline areas. It implied that species adaptation in different sites widely varied due to different levels of salinity. Therefore, Mango, Coconut and Tamarind could be growing intensively for increasing fruit production in coastal saline areas would be a fruitful way to increase household income.

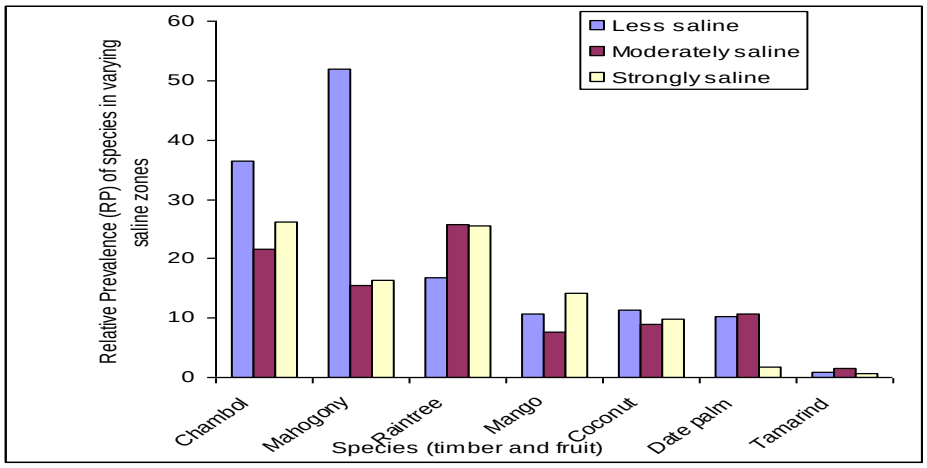


**Figure-2.** Relative prevalence of major timber-and fruit-yielding species in different saline areas of the studied south-central coastal zones of Bangladesh.

**Diversity indices of different categories of species**

The diversity index varies in differed groups of plant species in various saline zones which is contrasted relative prevalence is of the study areas (Table-5). The highest diversity index was found in moderately saline area, followed by strongly saline and less saline areas. The plausible reasons of variation in the biodiversity indices among the saline areas in which the homesteads of moderately saline areas adapted saline tolerant, moderately saline tolerant as well as less saline species which could have positive influence to increase the biodiversity indices. Side by side, diversity and abundance of timber-yielding species in all the studied areas was higher than fruit-yielding species along with other species. The reason may be that farmers like to grow the species for rapid economic return to the poor along with diversified purposes such as fuel wood, pole and timber etc. This variation may have negative relationship in terms of species and ecosystem diversity which in the long run may create negative impact in the livelihood and food security of all the inhabitants. Diversity indices of naturally growing species showed a little bit higher value (0.0003-0.0004) compared to medicinal and ornamental growing tree species. It might be a positive analogy that this species can survive and fit to protect various natural disasters in this region. It is a good sign for conservation of these naturally growing species.

**Table-5.** Species diversity indices of different categories of species in different saline zones of the studied areas of the south-central coastal region of Bangladesh.

| Farm category | $Pi^2$ | | | | | D* | E |
|---|---|---|---|---|---|---|---|
| | Timber-yielding | Fruit-yielding | Medicinal | Ornamental | Naturally growing | | |
| Marginal | 0.1112 | 0.0495 | 0.001 | 0.0001 | 0.0004 | 0.8379 | 0.3022 |
| Small | 0.1117 | 0.0517 | 0.0005 | 0.0001 | 0.0003 | 0.8355 | 0.3088 |
| Medium | 0.1066 | 0.0433 | 0.0014 | 0.0001 | 0.0003 | 0.8483 | 0.3323 |
| Large | 0.0983 | 0.0396 | 0.0004 | 0.0001 | 0.0003 | 0.8613 | 0.3625 |

*D=Simpson's diversity index, E =Simpson's equitability.

**Saline tolerant species**

A homestead yields good number of timber and fruit-yielding species grow for various household uses. But in particular observation showed that fruit production hampered due to salinity which negatively impacts income generation and food security of households. Saline water entered at the adjoining area of homestead during high tide. Drought in the dry season also caused damage of growing plant species. Tree species characterization based on salinity level is difficult task. However, information collected from the

respondents through group discussions and their opinions were recorded as the tree species tolerant to varying saline condition. Tree species was listed in two parts that comparatively survived in moderate to strong saline condition and less saline condition. Total of 15 species were identified adapted in moderate saline to strongly saline area and 15 species were adapted in less-saline area (Table-6). Information collected from the respondents would be useful that encouraged extension workers and farmers to plant saline tolerant species. Saline-tolerant species to be introduced to increase homestead plant diversity and overall production and farm outputs.

**Table-6.** Species grown in moderate to strongly saline tolerant and less saline areas of the study sites of the south-central coastal region of Bangladesh.

| Moderately to strongly saline tolerant species | | RP | Less saline tolerant species | | RP |
|---|---|---|---|---|---|
| Scientific name | English name | | Scientific name | English name | |
| *Acacia nilotica* | Arabic gum | 0.079[3] | *Alstonia scholaris* | Devils tree | 0.008[1] |
| *Aegle marmelos* | Wood apple | 0.168[3] | *Borassus flabellifer* | Palmyra palm | 6.439[1] |
| *Annona reticulata* | Bullocks heart | 0.0016[3] | *Cassia fistula* | Indian laburnum | 0.063 |
| *Azadirachta indica* | Country neem | 2.040[2] | *Citrus maxima* | Pummelo | 0.094[1] |
| *Bambusa tulda* | Bamboo | 0.068[3] | *Cocos nucifera* | Coconut | 11.282[1] |
| *Casuarina littorea* | Seef wood | 0.014[3] | *Embelica officinalis* | Indian gooseberry | 0.038[1] |
| *Citrus aurantifolia* | Lemon | 0.019[3] | *Erythrin fusca* | Coral tree | 0.158 |
| *Diospyros blancoi* | Wood nut | 2.1452[3] | *Limonia acidissima* | Elephant apple | 0.001[1] |
| *Ficus hispida* | Country fig | 0.047[3] | *Manikara* | Sapota | 0.137[1] |
| *Garcinia cowa* | Cowea | 0.009[3] | *Neolamarckia cdamba* | Wild cinchona | 0.041[1] |
| *Pithecellobium dulce* | Jilapi | 2.423 [2] | *Psidium guajava* | Guava | 3.716[1] |
| *Pongamia pinnata* | Indian buch | 0.670[3] | *Phoenix sylvestris* | Date palm | 10.199[1] |
| *Pithecellobium dulce* | Jilapi | 2.423[2] | *Syzygium fruticosum* | Jamun | 0.963[1] |
| *Sonneratia caseolaris* | *Chaila* | 0.004[3] | *Terminalia arjuna* | Malabar nut | 0.030[1] |
| *Tamarindus indica* | Tamarind | 1.458[2] | *Zizyphus mauritiana* | Jujube | 2.086[1] |

RP- Relative prevalence of species in coastal saline zones.

-Less saline area[1], -Moderate saline area[2], -Highly saline area[3].

**Homestead a home of in-situ conservation**

In the saline system, homesteads are the only place on which majority of the people depend. It is one of the valuable sites which act as the largest *in-situ* conservation centre of plant biodiversity. For domesticated species, *in-situ* conservation means the conservation of traditional farming systems with the exclusion of modern varieties. Homestead, the most important source of natural resources, plays an important role in the economy and provides nearly 50 percent cash flow to the rural poor (Ahmed,1999). It is observed that major threats of biodiversity to be the loss of habitat. The causes of biodiversity degradation are i) natural disasters, ii) lack of awareness, iii) land tenure and user rights issues, and iv) population growth and infrastructure development etc. The *in-situ* conservation, natural habitats have received high priority in the world conservation strategy programs (Kumar and Mahendra, 2000). For wild species, *in-situ* conservation is supposed to be the normal way of protection (Heywood and Watson, 1995). Steps should be taken to develop village based plant conservation strategy through engaging teachers and students of secondary schools and colleges of the respective localities. Some species which would be gradually decreasing needed to be conserved. These species are i) *Syzygium fruticosum*, ii) *Casuarina littorea*, iii) , iv) *Sapium indicum*, v) *Calamus rotung*, vi) *Psophocarpus tetragonolobus*, vii) *Abroma augusta*, viii) *Canavalia gladiata*, ix) *Diospyros montana*, x) *Morinda angustifolia*, *Annona reticulate* ,*Sonneratia caseolaris*, *Garcinia cowa*, *Neolamarckia cadamba*, *Cassia fistula* and *Spondias pinnata*. Akhter *et al.* (1989) mentioned that the farmers consider the trees as savings and insurance against the risk of crop failure and low yield. During natural disasters such as flood and cyclone, homestead is the only one place where people can get shelter and protect themselves. Especially the poor and pro-poor affected during this period, are fully dependent on

available plants and vegetables in the homestead. Therefore, massive plantations special attention to uncommon species in the homesteads and their management are the centre for conservation activities.

**Conclusion**

The identification of the most prevalent and dominant timber-yielding, fruit-yielding and other species is a significant finding of the study. Only a fewer number of timber-yielding and fruit-yielding species were being preferred for plantation which seemed to be harmful for enhancing homestead plant diversity and food security of this south-central region. Farmers are interested to plant timber yielding species which was not conducive for overall plant diversity. Because these timber-yielding species gradually replacing fruit and other local species. The alarming gap in terms of abundance between and among timber-yielding and fruit-yielding along with other species may result a negative relationship in terms of organismal and ecosystem diversity. In the long run, this timber-yielding species replacing other local and indigenous species which were influenced the livelihood of the inhabitants.

A comprehensive homestead space planning, proper scientific management of plants using diversified horticultural and agroforestry cultivars are needed to promote homestead plant diversity and their productivity in the saline system. A balance composition of homestead plant species is essential for maintaining ecological systems. As a result, a policy guideline is to be developed for production, distribution and plantation of fruit-yielding, medicinal and other local species to enrich plant diversity of this region. Government should launch a program for conservation of homestead plant biodiversity at local and regional levels. Steps should be taken to support farmers who are the victims of climate change in the coastal areas to foster homestead production system. A long and short range adaptation strategic plan for management and improvement of homestead production system while maintaining the diversity are needed.

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**Appendix-1:** List of major tree species and their relative prevalence (RP) in varying saline zones of south-central region of Bangladesh.

| Scientific name | English and local name | Relative prevalence of species in varying saline zones | | | Average trees | Total | | Uses |
|---|---|---|---|---|---|---|---|---|
| | | Lees saline | Moderately saline | Strongly saline | | % of homesteads with the species | RP all farm | |
| 1) Timber-yielding species | | | | | | | | |
| *Acacia auriculiformis* | Akashmoni/Acacia | 0.028 | 0.039 | 0.035 | 0.29 | 0.12 | 0.03 | T, F, Fe, P,Iy |
| *Acacia nilotica* | Babla/Arabic gum | 0.001 | 0.044 | 0.079 | 0.31 | 0.10 | 0.03 | T,Fw,F, Fe, Mv |
| *Avicennia marima* | Bain/Bean | ---- | ---- | 0.015 | 0.08 | 0.02 | 0.00 | T,Fw,F,P |
| *Bambusa vulgaris* | Bash (Basni)/Bambo | 0.187 | 0.331 | 0.438 | 1.64 | 0.24 | 0.40 | P,Fw,F,Hp,H, Iy |
| *Bambusa tulda* | Talla Bash /Bambo | 0.003 | 0.027 | 0.068 | 0.22 | 0.12 | 0.03 | H,Iy,Fw,P,H |
| *Ficus benghalensis* | Bot/Banyan tree | 0.063 | 0.028 | 0.001 | 0.19 | 0.12 | 0.02 | Av,Fw,H,Mv |
| *Albizia richardiana* | Chambol/Chapalish | 36.516 | 21.595 | 26.130 | 31.56 | 0.89 | 28.01 | T,Fw,Fe,P,H |
| *Alstonia scholaris* | Chatian/Devil's tree | 0.008 | ---- | ---- | 0.03 | 0.03 | 0.00 | Av, At,Fw,T,B |
| *Eucalyptus camaldulensis* | Eucalyptus | 0.001 | 0.004 | 0.013 | 0.12 | 0.04 | 0.00 | Fw ,P,T,S,H |
| *Excoecara agallocha* | Gewa or Goma | ---- | 0.263 | 0.031 | 0.40 | 0.13 | 0.05 | T, Fw,Iy,H |
| *Leucaena leucocephala* | Ipil-Ipil/ | 0.000 | ---- | 0.000 | 0.01 | 0.01 | 0.00 | Fw,F,Iy,T,P |
| *Pithecellobium dulce* | Jilapi | 0.014 | 2.423 | 0.935 | 2.18 | 0.37 | 0.80 | Fr,T,Fw,P,Mv,H |
| *Neolamarckia cadamba* | Kadam/Wild cinchona | 0.041 | 0.003 | 0.001 | 0.14 | 0.07 | 0.01 | F,T,Fw,Mv,Iy |
| *Lannea coromandelica* | Kapila or Jiga | 0.211 | 0.154 | 0.446 | 1.08 | 0.25 | 0.27 | Hp,P,F,Mv |
| *Pongamia pinnata* | Karanja/Indian buch | 0.019 | 0.595 | 0.670 | 1.16 | 0.29 | 0.33 | T,Fw,F,Iy,At |
| *Terminalia catappa* | Indian almond | 0.309 | 0.545 | 0.330 | 0.95 | 0.41 | 0.39 | Fw,Fr,T,Iy,H,At |
| *Sonneratia apetala* | Keora | 0.001 | 0.001 | 0.005 | 0.07 | 0.03 | 0.00 | T,F,Fe |
| *Albizia odoratissima* | Koroi/Black siris | 0.243 | 0.508 | 0.154 | 0.99 | 0.29 | 0.29 | T,Fe,F,P |
| *Albizia procera* | Sada Koroi | 0.198 | 0.413 | 0.346 | 0.98 | 0.33 | 0.32 | T, Fe, F, P |
| *Erythrin fusca* | Mandar/Coral tree | 0.158 | 0.021 | 0.039 | 0.35 | 0.18 | 0.06 | T, Fw, F, Hp |
| *Acacia mangium* | Mangium | ---- | ---- | ---- | 0.00 | ---- | 0.00 | F,Fw,P,T |
| *Swietenia mahagoni* | Mehagoni | 51.989 | 15.397 | 16.350 | 32.33 | 0.83 | 26.67 | T,F,Fw,H,Hm |
| *Oroxylum indicum* | Nauasonail | ---- | ---- | 0.002 | 0.05 | 0.00 | 0.00 | Fw,P |
| *Ficus religiosa* | Pakur/Pipal | 0.002 | 0.011 | 0.012 | 0.10 | 0.08 | 0.01 | Fe, Fw,Mv |
| *Erythrina variegata* | Paltymandar/Coral tree | 0.016 | 0.008 | 0.008 | 0.13 | 0.08 | 0.01 | T, Fw, F, Hp |
| *Trewia nudiflora* | Pitali/False white teak | ---- | ---- | ---- | 0.00 | ---- | 0.00 | Fw,P,T |
| *Samanea saman* | Rain tree | 16.718 | 25.686 | 25.547 | 24.41 | 0.93 | 22.68 | Fr,Fw,P, Iy |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Aphamixis polystachya* | Royna | ---- | 0.001 | 0.001 | 0.03 | 0.02 | 0.00 | F,T,At,B,Fw |
| *Tectona grandis* | Segun/Teak | 0.001 | 0.001 | 0.000 | 0.03 | 0.03 | 0.00 | T,F,Ir,H,Fw |
| *Dalbergia sissoo* | Sissoo | 0.009 | 0.000 | 0.004 | 0.09 | 0.04 | 0.00 | T,F,T,P,Ir,Fw |
| *Cassia fistula* | Sonail/Indianlaburnum | 0.063 | 0.028 | 0.001 | 0.19 | 0.12 | 0.02 | T, Fr,Fw, P |
| *Heritiera fomes* | Sundri | 0.000 | 0.035 | 0.007 | 0.20 | 0.05 | 0.01 | T,Fw, Fr, P |
| *Haldina cordifolia* | Kelikadam | ---- | ---- | ---- | 0.00 | ---- | 0.00 | T,P,Fw, Fr |
| *Ceiba pentandra* | KatTula/Cotton | 0.092 | 0.692 | 0.675 | 1.10 | 0.40 | 0.44 | Iy,H,F, P, T |
| *Gossypium harbaceun* | Karpash Tula /Cotton | 0.000 | 0.009 | 0.083 | 0.31 | 0.06 | 0.02 | Iy,Fw,P,F, T |
| *Bombax ceiba* | Simul tula /Silk cotton | 0.058 | 0.070 | 0.216 | 0.76 | 0.16 | 0.12 | Iy,Mv, P, T |
| 2) Fruit-yielding specie | | | | | | | | |
| *Mangifera indica* | Aam/Mango | 10.620 | 7.678 | 14.144 | 11.92 | 0.91 | 10.88 | Fr,Fw,F,Mv,J |
| *Embelica officinalis* | Indian gooseberry | 0.038 | 0.007 | 0.001 | 0.13 | 0.08 | 0.01 | Fr,Mv,J,A |
| *Spondias pinnata* | Amra/Hogplum | 0.033 | 0.066 | 0.374 | 0.45 | 0.28 | 0.12 | Fr,Mv,J,A,Ir |
| *Vitis vinifera* | Angur/Graps | 0.001 | ---- | 0.000 | 0.01 | 0.01 | 0.00 | Fr,Mv,Ir |
| *Malus sylvestris* | Apple | 0.000 | | 0.000 | 0.01 | 0.01 | 0.00 | Fr,Mv,Ir |
| *Phyllanthus acidus* | Arbarai/Aonla | ---- | ---- | ---- | 0.00 | ---- | 0.00 | Fr,Mv |
| *Annona reticulata* | Atafol/Bullocks heart | 0.003 | 0.001 | 0.016 | 0.10 | 0.06 | 0.01 | Fr,Mv,J,Fw |
| *Diospyros blancoi* | Beelati gab/Wood nut | 0.661 | 2.145 | 1.296 | 3.01 | 0.44 | 1.32 | Fr,Fw,T, At,Hc |
| *Aegle marmelos* | Bel/Wood apple | 0.009 | 0.033 | 0.168 | 0.29 | 0.18 | 0.05 | Fr,Mv,Hm,Iy,T |
| *Zizyphus mauritiana* | Boroi/Jujube | 2.086 | 1.118 | 0.207 | 1.88 | 0.54 | 1.02 | Fr,Fw,Mv,A,P |
| *Dillenia indica* | Chalta/Indian dillenia | 0.003 | 0.002 | 0.072 | 0.15 | 0.10 | 0.01 | Fr,Mv,A,Fw |
| *Averrhoa carambola* | Chinese gooseberry | 0.003 | 0.002 | 0.072 | 0.15 | 0.10 | 0.01 | Fr, F, Mv |
| *Garcinia cowa* | Couphal/Cowea | 0.007 | 0.003 | 0.009 | 0.13 | 0.05 | 0.01 | Fr,Mv,P,Fw |
| *Punica granatum* | Dalim/Pomegranate | 0.003 | 0.038 | 0.011 | 0.17 | 0.09 | 0.01 | Fr,Mv |
| *Syzygium fruticosum* | Deshijam/Jamun | 0.963 | 0.825 | 0.295 | 1.33 | 0.50 | 0.66 | Fr,Mv,F,P,T,H |
| *Citrus aurantifolia* | Deshilebu/Lemon | 0.186 | 0.093 | 0.196 | 0.58 | 0.28 | 0.16 | Fr,Mv, |
| *Artocarpus lacucha* | Monkey jack | 0.077 | 0.118 | 0.094 | 0.40 | 0.24 | 0.10 | Fr,Mv,J,BF |
| *Syzygum jambos* | Golapjam/Rose apple | 0.000 | ---- | 0.002 | 0.02 | 0.02 | 0.00 | Fr,Fw,P |
| *Elaeocarpus robustus* | Jalpai/Indian olive | 0.001 | 0.000 | 0.026 | 0.07 | 0.07 | 0.00 | Fr,A,J,T |
| *Syzygium wallichii* | Jam/Jamun | 0.000 | 0.005 | ---- | 0.03 | 0.03 | 0.00 | Fr,Mv,T,F,Fw |
| *Citrus maxima* | Jambura/ Pummelo | 0.077 | 0.118 | 0.094 | 0.40 | 0.24 | 0.10 | Fr,Mv,Fw |
| *Syzygium samarangense* | Jamrul/Wax jambo | 0.108 | 0.020 | 0.115 | 0.32 | 0.23 | 0.07 | Fr,Fw,Mv,T |
| *Limonia acidissima* | Kadbel/Elephant apple | 0.001 | 0.001 | --- | 0.0 | 0.0 | 0.00 | Fr,Mv,Hm |
| *Citrus aurantifolia* | Kagogilebu/Lemon | 0.009 | 0.013 | 0.019 | 0.19 | 0.07 | 0.01 | Fr,Mv,Hm |
| *Citrus aurantium* | Kamla/Orange | 0.001 | 0.000 | 0.001 | 0.02 | 0.02 | 0.00 | Fr,Mv,J |
| *Artocarpus heterophyllus* | Kathal/Jack fruit | 1.085 | 0.951 | 4.203 | 3.13 | 0.61 | 1.90 | Fr,Fw,T,Fe,Mv |
| *Phoenix sylvestris* | Khejur/Date palm | 10.199 | 10.766 | 1.740 | 8.92 | 0.78 | 6.98 | Fr,J,Fw,Iy,J,H |
| *Phoenix dactylifera* | Khurmakhejur | ---- | 0.001 | ---- | 0.01 | 0.01 | 0.00 | A&BF,Fw |
| *Baccaura ramiflora* | Latkan | ---- | ---- | ---- | 0.00 | ---- | 0.00 | Fr, Mv,Fw |
| *Litchi chinensis* | Litchu/Litchi | 0.015 | 0.009 | 0.011 | 0.13 | 0.09 | 0.01 | Fr,Mv,Fw |
| *Cocos nucifera* | Narikel/Coconut | 11.282 | 8.892 | 9.901 | 11.08 | 0.91 | 10.06 | Fr,D,Iy,Hf,Fw |
| *Diospyros malabarica* | Pechi gab/River ebony | 0.072 | 0.684 | 0.354 | 1.09 | 0.30 | 0.32 | Fr,Fw, Dy,Mv |
| *Psidium guajava* | Peyara/Guava | 3.716 | 3.036 | 2.750 | 4.44 | 0.71 | 3.16 | Fr,Mv,J |
| *Manilkara zapota* | Safeda/Sapota | 0.137 | 0.004 | 0.020 | 0.26 | 0.15 | 0.04 | Fr, Mv,Hm,Fw |
| *Moringa oleifera* | Sajna/Drumstick | 0.002 | 0.001 | 0.000 | 0.05 | 0.02 | 0.00 | Fr,V,Mv,Fw |
| *Citrus aurantium* | Sarbati lebu/Lemon | 0.000 | 0.000 | 0.002 | 0.03 | 0.02 | 0.00 | Fr,Mv,Hm |
| *Annona squamosa* | Sarifa/Custard apple | 0.007 | 0.031 | 0.001 | 0.12 | 0.08 | 0.01 | Fr, Mv,Hm,Fw |
| *Areca catechu* | Supari/Betel nut | 2.262 | 2.215 | 14.142 | 9.96 | 0.53 | 5.31 | Fr, Mv,Fw,F,P |
| *Borassus flabellifer* | Tal/palmyra palm | 6.439 | 5.425 | 2.738 | 6.13 | 0.78 | 4.78 | Fr,J,Hf,M,T,Fw |
| *Tamarindus indica* | Tetul/Tamarind | 0.797 | 1.458 | 0.580 | 2.05 | 0.45 | 0.93 | Fr,Mv,T, Fw,F |
| *Averrhoa carambola* | Chinese gooseberry | 0.077 | 0.118 | 0.094 | 0.40 | 0.24 | 0.10 | Fr,Mv,Fw |
| 3) Medicinal and spice-yielding species | | | | | | | | |
| *Calotropis gigantea* | Swallow wort | 0.020 | 0.007 | 0.000 | 0.10 | 0.06 | 0.006 | Hm,Mv,Fw |
| *Terminalia arjuna* | Arjun/Malabar nut | 0.030 | 0.002 | 0.021 | 0.16 | 0.10 | 0.015 | Hm,Mv,T,Fw |
| *Justicia adhatoda* | Basak | 0.003 | 0.001 | 0.001 | 0.04 | 0.03 | 0.001 | Hm, Mv |
| *Terminalia bellerica* | Bohera/Belleric myrobalan | 0.001 | 0.000 | 0.000 | 0.02 | 0.02 | 0.000 | Hm |
| *Chinnamomum verum* | Daruchini/ | 0.001 | 0.000 | 0.001 | 0.03 | 0.03 | 0.001 | Sp |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Cinnamon | | | | | | | |
| *Azadirachta indica* | Deshi neem/Neem | 1.478 | 2.040 | 0.065 | 1.91 | 0.49 | 0.938 | Hm,P,Fw,F |
| *Elettaria cardaomum* | Elachi/Cardamon | ---- | ---- | ---- | 0.00 | ---- | 0.00 | Sp |
| *Melia azedarach* | Ghora neem/Bread tree | 0.001 | 0.004 | 0.000 | 0.03 | 0.03 | 0.001 | P,Fw,Hm |
| *Terminalia chebula* | Hartaki/ Black myrobalan | 0.001 | 0.000 | 0.000 | 0.02 | 0.02 | 0.000 | Hm,Mv |
| *Litsea glutinosa* | Lot-pipal | 0.000 | ---- | 0.025 | 0.07 | 0.05 | 0.003 | Hm |
| *Vitex negundo* | Nishinda/Chase tree | 0.000 | 0.001 | 0.001 | 0.03 | 0.03 | 0.001 | Hm,Hv |
| *Tinospora cordifolia* | Paddaguruch | 0.000 | 0.000 | ---- | 0.01 | 0.01 | 0.000 | Hm, Mv |
| *Cinnamomum tamala* | Tejpata/Bay leaf | 0.008 | 0.000 | 0.010 | 0.07 | 0.06 | 0.004 | S,Mv |
| *Ocimum tenuiflorum* | Tulsi/Basil | 0.001 | 0.004 | 0.000 | 0.03 | 0.03 | 0.001 | Hm, |
| *Abroma augusta* | Delvil's cotton | 0.000 | ---- | 0.002 | 0.02 | 0.02 | 0.000 | Hm |
| *Sapium indicum* | Urmai/Hurmoi | 0.013 | 0.001 | 0.000 | 0.08 | 0.03 | 0.003 | Bio-pesticide |
| 4) Ornamental plant species | | | | | | | | |
| *Mimusops elengi* | Bakul/Indian medlar | 0.0025 | 0.0063 | 0.0013 | 0.07 | 0.05 | 0.0031 | F,Av,Rp,Hp,Rp |
| *Jasminum sambac* | Beli/Arabian jasmine | 0.0039 | 0.0047 | 0.0019 | 0.06 | 0.05 | 0.0034 | F, Av,Hp,Rp |
| *Bougainvillea spectabilis* | Bougainvillea | 0.0014 | 0.0100 | 0.0014 | 0.06 | 0.06 | 0.0034 | F,Av,Hp,Rp |
| *Michelia champaca* | Chapa/Champaka | 0.0044 | 0.0006 | 0.0002 | 0.04 | 0.03 | 0.0012 | F,Av,T,Fw,Hp |
| *Polyalthia longifolia* | Debdaru/Most tree | | 0.0005 | | 0.01 | 0.00 | 0.0001 | Av,Fw,P, Fw |
| *Gardenia jasminoides* | Gandharaj/Gardenia | 0.0056 | 0.0531 | 0.0047 | 0.13 | 0.12 | 0.0156 | F, Rp,Mv |
| *Hibiscus rosa-sinensis* | Jaba/China rose | 0.0183 | 0.0506 | 0.0600 | 0.23 | 0.18 | 0.0411 | F,Rp,Mv |
| *Casuarina littorea* | Jhau/Seef wood | -- | 0.0014 | 0.0002 | 0.02 | 0.02 | 0.0003 | Av,P,H,Fw |
| *Neium indicum* | Karabi/Oleander | 0.0002 | ---- | 0.0006 | 0.01 | 0.01 | 0.0002 | Av,F,Rp |
| *Thevetia peruviana* | Karali/ Lucky nut | 0.0016 | 0.0063 | ---- | 0.05 | 0.03 | 0.0016 | F,Rp,Fw |
| *Delonix regia* | Krisnachura/ Gulmohur | 0.0127 | 0.0077 | ---- | 0.07 | 0.07 | 0.0044 | Av,F,Fr, Fw,Mv |
| *Lawsonia inermis* | Mendi/Henna | 0.0127 | 0.0056 | 0.0306 | 0.12 | 0.12 | 0.0146 | Av,C,Hm |
| *Catharanthus roseus* | Nayantara/Periwinkle | ---- | ---- | ---- | 0.00 | ---- | 0.00 | Av,F,Rp |
| *Codiaeum variegatum* | Patabahar /Croton | ---- | ---- | ---- | ---- | ---- | ---- | F,Hp,Fw |
| *Polianthes tuberosa* | Rajanigandha/ Tube rose | ---- | ---- | ---- | ---- | ---- | ---- | F,Hm,C,Rp |
| *Ixora coccinea* | Rangan | 0.0006 | 0.0002 | ---- | 0.01 | 0.01 | 0.0002 | F,Hp,Rp |
| *Nyctanthes arbor-tristis* | Seuli/Jasmine | 0.0002 | 0.0025 | 0.0025 | 0.04 | 0.04 | 0.0014 | F,C,Rp |
| 5) Naturally growing species | | | | | | | | |
| *Cordia dichotoma* | Bahal | ---- | ---- | ---- | 0.00 | ---- | 0.00 | Fw,T, Fr |
| *Hibiscus tiliaceus* | Balai-gach/ Sea hibiscus | 0.075 | 0.008 | 0.000 | 0.17 | 0.09 | 0.016 | Fw,T |
| *Hydnocarpus kurzii* | Bal-gach | 0.040 | 0.017 | 0.038 | 0.23 | 0.13 | 0.031 | Fw, T, Fr |
| *Spondias dulcis* | Bunoamra/Wild hogpalm | 0.002 | 0.002 | 0.003 | 0.05 | 0.04 | 0.002 | Fr,BF,Fw |
| *Artocarpus chaplasha* | Ban-kathal | 0.020 | 0.000 | ---- | 0.07 | 0.04 | 0.003 | BF,Fw,P |
| *Sonneratia caseolaris* | Chaila | --- | 0.007 | 0.004 | 0.07 | 0.04 | 0.003 | Fr,BF,Fr,Fw,Mv |
| *Ficus hispida* | Dumur/Country fig | 0.025 | 0.008 | 0.047 | 0.23 | 0.11 | 0.025 | Fr,Fw,Mv,BF |
| *Calophyllum inophyllum* | Gaitta/ Borneo mahogany | 0.001 | 0.001 | ---- | 0.03 | 0.02 | 0.000 | Fw,At,P,Fe |
| *Lannea coromandelica* | Gigni | ---- | 0.001 | 0.009 | 0.06 | 0.03 | 0.002 | Hp,Fw,P,Fe |
| *Streblus asper* | Harra/Roughbush | 0.152 | 0.005 | 0.425 | 0.61 | 0.23 | 0.138 | F,T, B,At |
| *Barringtonia acutangula* | Hijal/ Indianoak | 0.011 | 0.001 | 0.069 | 0.19 | 0.09 | 0.018 | F,Av,Fw,T,Mv |
| *Ficus glomerata* | Jagdumur/Fig | 0.000 | 0.031 | 0.014 | 0.15 | 0.07 | 0.011 | Fr,Fw,Mv,BF |
| *Morinda angustifolia* | Mewakhathal | ---- | 0.00 | ---- | 0.00 | ---- | 0.00 | A and BF, P,Fw |
| *Aphamixis polystachya* | Royna | 0.001 | 0.006 | 0.020 | 0.10 | 0.07 | 0.007 | P,Fw,H,Mv |

A&BF- Animals and bird food, A-Achar, At-Agricultural tools, Av-Aesthetic value, B-Boat, D-Dyeing/Drink, F- Fodder, Flower, Fence, Fe-Furniture, Fr-Fruit, Fw-Fuel wood, Hf-Hand fan, H-Handicrafts, Hm-Herbal medicine, Hp-Hedge plants, Iy-Industry, J-Jam/Jelly/Juice, M-Molasses, Mv-Medicinal value, P-Pole, Rp-Religious purpose, Sp-Spices, S-Scent, T-Timber, V-Vegetable.