Harnessing the Indigenous Knowledge Base Associated with Horticultural Enterprise for Sustainable Development of North Eastern State, Manipur, India

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Abstract

In the present scenario, North Eastern States, sleeping giants are the store house of indigenous knowledge base which may be utilized for second green revolution towards sustainable development of the rural areas without hampering the ecological pursuits of the region. The enriched biodiversity and other indigenous knowledge base are still unexplored and not known to others. The horticulture enterprise is one of the important vocations of the north eastern hill region people and their management practices are ancient, indigenous and traditional in nature. Consequently, the need of the hour is to explore the indigenous knowledge base associated with the horticultural enterprise in the north eastern region for assessing the scientific rational of the same and creating a new blend of technology mix for sustainable development of the horticultural enterprise. Keeping the above consideration in view, the present study is conducted to harness the indigenous knowledge base associated with the horticultural enterprise in Manipur state. The participatory methodology was followed to construct and conduct the whole research study. The key informant methods and focus group discussion methods were followed to collect the information. The collected information reflected that certain plants are used traditionally in combination with other plants for extraction and preparation of dyes utilizing indigenous processes. The people also have a tradition of conserving wild orchids in nature based on various religious beliefs and herbal healthcare. It is an important factor for sustainability of natural genetic resource management. Certain plants are used by the ethnic people of Manipur to forecast weather, to predict natural calamities and as taboos to avoid negative occurrences. These traditional knowledge systems are taken care and also preserve these plants as an important resource. Thus ample number of indigenous knowledge is available in this region which would be refocused in near future.

Keywords
Horticultural enterprise, Indigenous knowledge, North eastern state, Participatory methodology, Sleeping giant, Sustainable development.

Introduction

All aspects of human culture are rich with references and meanings regarding plants since they have different cultural background and symbolic meanings which still greatly influences modern plants preferences and uses in our life. Manipur is one of biodiversity rich states of the seven sister states of North eastern region having a total geographic area of 22,327 sq.km. (Longitude-93.20E-94.47E and latitude 23.50N-25.41N). As we move into the decades of environment, it is obvious that the garden plays an important role in
environmental improvement. However, the value of the garden in our spiritual civilization will be paid more attention too, because the garden is an art to express the highest truths of religion, philosophy and has been used as a haven for reflection by philosopher and as a source of inspiration and a symbol of virtue/vice by artists and poets. Plants and nature are woven into the unconscious mind of human and served as a source of spiritual renewals. In order to satisfy the unlimited want of humanity, optimal utilization of the scarcity of resources to increase human welfare in a sustainable development is the challenges the entire world faces today. North-eastern region of India is the traditional home of near about 876 orchid species belonging to 151 genera of which many species are economically important for their ornamental and medicinal values. The people of this region have a tradition of conserving wild orchids in nature, based on various religious beliefs and culture. Keeping the above consideration in view, the present study is conducted to harness the indigenous knowledge base associated with the horticultural enterprise in Manipur state.

Results and Discussion

Majority of the farmers were in middle-age category (70%). Most of the farmers had medium level of education (63.33%). Majority of respondents were under medium level of education. Agriculture was the sole occupation of 25 percent farmers whereas others had subsidiary occupations. Most of the respondents were medium farmers (66.66%). Majority of the respondents were having medium size of land holding. Majority of the farmers had medium levels of annual income (55%) and material possession (60%) (Table 1).

Plants associated in forecasting and beliefs within the community of Manipur

Certain plants have been used by the ethnic people of Manipur to forecast weather, to predict natural calamities and as taboos to avoid negative occurrences.

*Agave americana* Linn. (Agavaceae)/ Agave plant or century plant *Kewa* (Manipur), *Sisal* (Hindi) – T1

The flowering pattern of this plant is used to predict the direction of the winds and storms in a given year. This storm or wind is expected to blow from the opposite direction from where the greatest number of flowers is positioned in an inflorescence.

*Alocasia indica* Schott. (Araceae)/ Alocasia or Elephant ear plant *Yendem* (Manipur) – T2

This plant seldom produces flowers in home gardens. If it does, it is assume that the family that cultivate this plant may face certain difficulties and that the prosperity of the family will be ruined. If the flowering is noticed, the entire plant is removed immediately from the garden.
If the bamboo bears flowers, it is predicted that there will be famine in the coming years. When there is bamboo flowering, the numbers of rodent increase thereby damaging the crops. If the apex crown (shoot) is cultivated on private land is is domed shaped, it is assumed that one member of the family may die shortly because bamboos in this shapes are used in funeral ceremonies.

If this is noticed the bamboo is cut immediately. Cutting down bamboos on Tuesdays and Saturdays is prohibited. It is believed that bamboo colony may die shortly and prosperity of the family may decline.

Traditionally, a handful of mustard seeds are immediately sown on the funeral site of the dead person. If the seeds sprout and grow into seedlings, it is believe that the dead person may be reborn as another creature.

This is practice as an indicator of how much the deceased person contributed for betterment of the society when he is alive.

It is believed that when the branch of this tree falls down the person in the direction of the branch which has fallen may die. If crows construct their nest on top branch, it is assumed that flood may occur in that particular year and that there will be fewer winds and windstorms whereas of the nest is made on the lower branches of the tree, there may be strong winds in that year.
The bark of this tree is used by local healers to treat heart disease.

The fresh tree bark soaked in water overnight is given to patients for heart related problems mainly weak hearts. However, any bark collected without formal request to the tree is not used for the treatment.

Therefore, before collecting the bark from a leaving tree, one visit the tree one day ahead of collection, make it an offering of beetle nuts and leaves, request permission to collect some barks.

**Natural dye yielding plants and indigenous knowledge of dyeing**

These plants are used traditionally in combination with other plants for extraction and preparation of dyes utilizing indigenous processes.

*Acacia catechu* Wild (Mimosaceae)/Kabokhajee (local name) – T11 A fast reddish black dye

*Achyranthus aspera* Linn. (Amaranthaceae)/Khujumpere (local name) – T12 Adhesive for various colours and making colours brighter

*Amoora spectabilis* Miq. (Meliaceae)/Ungang (local name) – T13 A pale scarlet colour

*Basella alba* Linn. (Basellaceae)/Urok sambal (local name) – T14 A deep purple dye, different colours obtained from leaves and stems and is used for dyeing fabrics and painting (Fig. 1).

### Table 1 Socio economic Profile of Farmers

| Sl.no | Variable | Category | Frequency | Percentage |
|-------|----------|----------|-----------|------------|
| 1     | Age      | Young    | 8         | 13.33      |
|       |          | Middle   | 42        | 70.00      |
|       |          | Old      | 10        | 16.67      |
| 2     | Education| Low      | 13        | 12.67      |
|       |          | Middle   | 38        | 63.33      |
|       |          | High     | 9         | 15.00      |
| 3     | Occupation| Agriculture | 15       | 25.00      |
| 4     | Land holding| Agriculture & others | 45 | 75.00       |
|       |          | Small    | 10        | 16.67      |
|       |          | Medium   | 40        | 66.66      |
|       |          | Large    | 10        | 16.67      |
| 5     | Income   | Low      | 12        | 20.00      |
|       |          | Medium   | 33        | 55.00      |
|       |          | High     | 15        | 25.00      |

### Table 2 Use Intensity Index of ITKs

| T1   | 11.67 | T9    | 18.33 | T17   | 70.83 | T25   | 54.2 |
| T2   | 33.33 | T10   | 75    | T18   | 78.33 | T26   | 19.16 |
| T3   | 91.67 | T11   | 21.67 | T19   | 26.66 | T27   | 23.33 |
| T4   | 100   | T12   | 19.16 | T20   | 58.3  | T28   | 41.66 |
| T5   | 15    | T13   | T13   | T21   | 35    | T29   | 60   |
| T6   | 98.83 | T14   | T14   | T22   | 32.5  | T30   | 62.5 |
| T7   | 12.5  | T15   | 23.33 | T23   | 50    | T31   | 64.17 |
| T8   | 83.33 | T16   | 43.33 | T24   | 28.33 |
Fig. 1 Plants associated with weather forecast and dyeing agent

Agave americana  Alocasia indica  Bambusa spp
Mangifera indica  Hibiscus cannabinus  Platycerium wallichii
Quercus serrata  Brassica campestris  Ficus rumphii
Terminalia tomentosa  Basella alba  Celosia argentea
Clitoria ternatia
Melastoma malabathricum
Parkia roxburgii
Tectona grandis
Bauhania purpurea
Berberis manipurana
Bixa orellana
Achyranthus aspera
Acacia catechu
Carthamus tinctorius
Emblica officinalis
Iris bakeri
Fig. 2 Orchids and its natural habitat

Ascocentrum ampullaceum

Paphiodelum spicerianum

Vanda amesiana

Vanda stageana

Rhyncostylis retusa

Dendrobium transparens

Sacred groves

Sacred groves

Celosia argentea Linn. (Amaranthaceae)/ Haorei angangba (local name) – T15

Clerodendrum odoratum D. Don (Verbanaceae) Kuthap (local name) – T16 A pale green dye is obtained from the leaves.

Clitoria ternatia Linn. (Papilionaceae)/ Aparajita (local name) T17 A blue dye is obtained from flowers

Melanorrhoea usitata Wall. (Anarcadiaceae)/ Khe-U (local name) – T18 An oily blackish dye obtained from woods and roots.

Melastoma malabathricum Linn. (Melastomataceae)/ Yachubi (local name) – T19 A dark blackish red

P. roxburgii G. Don (Mimosaceae)/ Yongchak (local name) – T20 A deep chocolate dye

Stribilanthes flaccidifolius Nees. Syn. S. cusia Nees Imly (Acanthaceae)/ Kum (local name) – T21 Indigo colour and black

Tectona grandis Linn. f. (Verbenaceae)/ Chingshu (local name) – T22 Red for dyeing
silk. *Bauhania purperea* Linn. (Ceasalpiniaiceae)/ Chingthrao angangba (local name) – T23 A rose purple dye from fresh flower

*Berberis manipurana* Ahr. (Berberidaceae)/ U-napu (local name) – T24 A beautiful yellow dye from stem and roots

*Bixa orellana* Linn. (Bixaceae)/ Ureirum (local name) – T25 A pale red dye obtained from seeds

*Carthamus tinctorius* Linn. (Asteraceae)/ Kusumlei (local name) – T26 A golden yellow dye from flowers

*Curcuma domestica* (Zingerberaceae)/ Yaingang (local name) – T27 A yellow dye obtained from rhizomes

*Emblica officinalis* Gaertn. (Euphorbiaceae)/ Heikru (local name) – T28 A black dye from fruits and barks

*Iris bakeri* Wall. (Iridaceae)/ Kombirei (local name) – T29 A blue colour obtained from flowers

*Pasania pachyphylla* (Kurz.) Schottky (Fagaceae)/ Kuhi (local name) – T30 Reddish brown to brown obtained from bark

*Solanum Indicum* Linn. (Solanaceae)/ Khamu (local name) – T31 Purple dye prepared from dye

The people of the state have been using indigenous dye stuffs from plants since time immemorial, in handicrafts, handlooms, fine arts etc. Though the history of the state witnesses the intensive used of natural dyes since ancient times, documented systematic investigations are few. The people of Manipur can produce these dyes in large scales, commercially by opening factories and can compete with chemical dyes which are harmful to environmental point of view. It also serves as source of socio-environmental development of the people in Manipur in particular and for the nation in general.

**Traditional knowledge on conservation of wild orchids**

The people have a tradition of conserving wild orchids in nature based on various religious beliefs and herbal healthcare. It is an important factor for sustainability of natural genetic resource management. Manipur is also rich in orchid diversity and occupies fourth position in orchid diversity. Out of 251 orchids found in the state four species *Ascocentrum ampullaceum, Paphiodelum spicerianum, Vanda amesiana* and *Vanda stageana* are endemic to the state. The people conserve orchids in their natural habitats in sacred groves. Sacred groves are the forest patches rich in biodiversity and play an important role in conservation by the local communities in sustainable manner with their socio-cultural and religious practices. Dedicating a patch of forest land to deities is the common practice for the Meitei community which assumes great significance in conservation of natural diversity. According to the belief, the sacred groves are the property of Gods and not to allow anyone to damage which help to conserve the orchids in their natural habitat. Therefore, there is urgent need to protect the valuable orchid species in their natural habitats as orchids are very sensitive to ecological disturbances. Understanding the traditional knowledge of conserving the orchids of the local people will be helpful for sustainable orchid resource management of this region (Fig. 2).

As local communities practice this traditional knowledge systems; they take care and preserve plants as an important resource. The people can also produce dyes in large scales,
commercially by opening factories and can compete with chemical dyes which are harmful to environmental point of view. It also serves as source of socio-environmental development of the people. There should be a blend between scientific knowledge and indigenous knowledge so that a strategy can be prepared for the second green revolution in the sleeping giant area.

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