BEEKEEPING FOR RURAL DEVELOPMENT, BEEKEEPING AGAINST POVERTY, ACHIEVING BEEKEEPING EXTENSION: A BANGLADESH PERSPECTIVE

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Bangladesh – **an overview** (Source: Bangladesh Bureau of Statistics 1999)

- ***Geographical Location*****:** between 20°34´ and 26°38´ north latitude and between 88°01´ and 92°41´ east longitude. And lies in the north eastern part of the South Asian Sub Continent.
- ***Boundary:*** North-India; West-India; South-Bay of Bengal; East-India and Myanmar.
- ***Area and Population:*** 147570 Sq-km with a population of about 130 million. About 80% of the population lives in the rural areas of which 63% is depend on agriculture.
- ***Territorial water:*** 12 nautical miles.
- ***Socio-economic status:*** One of the most densely populated (755 persons per sq-km) countries in the world. Population growth rate is 1.67%. Per Capita GDP is US $ 367. GDP growth is mainly depend on agriculture and industry. Contribution of this two sectors to GDP is 29.2% and 11.2% respectively. So agriculture dominates the economy and determines the income and consumption level of the vast majority of rural population. UNDP's Human Development index is 146th out of 174. However, in the context of present socio-economic position per capita income is low, capital is scarce and unemployment rate is alarmingly high above 30%. In this context, in order to create employment and reduce poverty, Bangladesh Small and Cottage Industries Corporation (BSCIC) initiated and are implementing a good number of development projects. Of which beekeeping project is the most prospective one against poverty by way or rural development.

Beekeeping – Background in Bangladesh

Since time immemorial beekeeping has been practiced haphazardly in Bangladesh. At early time this activity could be called as bee hunting not as beekeeping. It was done mainly for honey collection in crude method in the way of beehunting which is even found in the present time in some areas.

Keeping or rearing bees in wooden hives probably started in the country at the time of self-reliant movement of Mahatma Gandhi in 1940. Before this, people used to keep bees in wooden logs, clay pots, bamboo and straw baskets etc. Their effort appears to be very limited. In 1950's the Govt. of the then East Pakistan came to know and understand the feasibility and necessity of beekeeping and accordingly tried to start beekeeping in the Sylhet district. The result was not satisfactory due to insufficient technology and improper planning. During this whole time beekeepers-cum-catchers-cum-amateurs were trying to keep bees in hives. A few of them were partly successful but diseases with other problems again resulted in failure.

In the 1960's Bangladesh Small & Cottage Industries Corporation (BSCIC) started beekeeping in wooden hives at Jatrapur under Khulna. The result at that time was not also satisfactory due to inappropriate technology and ultimately the activities were stopped in the same decade. In 1977 BSCIC again started beekeeping in modern and scientific way. Having successful efforts promotion and extension of beekeeping activities is being launched by BSCIC throughout the country since 1977. Now on realizing the importance and utility of honey, other bee products and beekeeping, many other organizations started and assisted modern beekeeping in the country. However, no attempt was made prior to BSCIC in the past to introduce modern, scientific and systematic beekeeping in Bangladesh. Objectives of the projects are:

- Identify and utilize the honey resource areas in the country.
- Propagate and familiarize scientific method of beekeeping through training and demonstration.
- Increase the production of quality crops, fruits, vegetables and seeds through cross-pollination.
- Plantation in the view point of beeplants and environment as well.
- Poverty alleviation, employment and income generation, production of pure honey in the form or rural development in the country.

The economy of Bangladesh is depending on agriculture mainly in the rural areas. So the necessity of beekeeping, its expansion and development is indeniable and its potentiality is vast in favor of the agriculture based rural economy of Bangladesh. Because, a remarkable achievement may be made in the field of Agricultural and Horticultural production through cross-pollination. And one of the main sources for this cross-pollination is the untired and dedicated labor of honeybees.

Types of honeybees in Bangladesh

The following types of honeybees are found and/or reared in Bangladesh.

Apis dorsata: Origin in Asia. Vernacular name of this species is Das/Pahari/Daittya. They are the largest amongst all the honeybees and are ferocious in nature. Almost black in color. Found mainly in the open branches of trees and comparatively in high places. Each colony consist of single comb. A colony normally comprising of one queen, several thousand worker (female bee but sterile) and several hundred drone (male bee) in all the honeybee species. They have high stinging reflex and frequent migratory habit. Honey production is good. Thirty to forty kilograms of honey may be produced per year from a single productive colony in average. Quality of honey is comparatively inferior. It has not been possible to domesticate this type of honeybees in wooden hives. Research is going on to do so. It is found throughout the country in natural condition, specially large number in the Sunderban forest areas.

Apis florea: Primary residence is in Asia. They are called small bees. Smallest in size amongst bees. Golden color and quiet in nature. Less stinging reflex and occasional migratory habit. Found in dry and shadow places viz. bush of plants, almirah (old), sun-shade of building, window shade. Single colony have single comb like *A. dorsata*. Honey production capacity is very low. Five hundred grams of honey may be produced per year from a productive colony. Quality of honey seems to be very good. It has not been possible to domesticate these bees in the box till today. Found through the country.

Apis cerana: Origin in Asia. Twelve sub species are scientifically identified till today. It is called as Indian bee or khong bee. Medium sized, golden color and comparatively quiet in nature. Found in the dry, shadow and dark places viz. hole of old trees, earthen pot, sunshade of building, occasionally used old almirah, hole of earth etc. Single colony have many combs. Less migratory habit and easy to domesticate. Medium stinging habit but it is high in swarming period. Abscondition is a common phenomenon specially in case of ill management. In average 10 kilogram of honey may be produced per colony per year from a productive colony. Quality of honey is superior. In Bangladesh research is going on to increase the honey production.

The species is being cultivated in domestic way throughout the country as modern and scientific. Beekeeping and found almost everywhere in the country in natural condition. Rearing or keeping of these bees for honey production are successfully expanding in many countries of the world viz. China, India, Bangladesh, Japan, Pakistan, Nepal, Thailand, Vietnam, Malaysia and Srilanka.

Apis mellifera: Origin in Europe and Africa. Now cultivated worldwide. Introduced in Bangladesh in the last decade of 20th century. Medium sized, golden color and quiet in nature. Each colony have many combs. Less stinging reflex, swarming habit and nearly no abscondtion. Lion portion of the honey and other bee products are produced by rearing or keeping this species of honeybees in the World. On the basis of good beekeeping source or bee plants and of migratory beekeeping more than 50 kilograms of honey may be produced from a single productive colony per year which is about five times than that of *Apis cerana*. It is to be noted that scientific research work is carrying on *Apis mellifera* for its development and extension in many developed countries of the World since 17th century. A few years back it has been introduced in Bangladesh.

Beeplants

Large number of bee plants species are found plenty throughout the country round the year. At least 10 are major. They are: *Brassica napus* L.*, Litchi chinensis* Camb.*, Zizyphus jujuba* Lamk.*, Moringa oleifera* Lam.*, Cocos nucifera, Helianthus annuus* L.*, Eugenia jambolana* Lamk.*, Coriandrum sativum* L.*, Citrus* sp.*, Sesamum indicum* Dc.

Of course there must be more than sixty semi major bee plants are found in different areas of Bangladesh. Such as: *Raphanus sativus* L.*, Brassica* sp.*, Mimosa pudica* L.*, Mimusops elengi* L.*, Mikania scadens* L.*, Musa balbisiana* Colla.*, Mangifera indica* L.*, Leucas aspera* Spreng.*, Linum usitatissimum* L.*, Glycosmis pentaphylla* Correa.*, Foeniculum vulgare* Gaertn.*, Eugenia jambos* L.*, Dolichos lablab* L.*, Cucumis sativus* L.*, Crotalaria juncea* L.*, Cajanus cajan* Mill.*, Borassus flabellifer* L.*, Bombax malabaricum* Dc.*, Azadirachta indica* Juss.*, Averrhoa carambola* L.*, Albizzia* sp*. Benth., Allium* sp*. L., Hibiscus esculentus* L.*, Ipomoea alba* L.*, Lagerstroemia frox-reginme* Rez.*, Marmardica charantia* L.*, Ocimum sanctum* L.*, Psidium guava* L.*, Pisum sativum* L.*, Solanum melongena* L.*, Solanum lycopersicum* Mill.*, Trachyspermum amni* Spreng.*, Celosia cristata, Cosmos bipinnatus., Alstonia scholaris., Anthocephalus cadamba, Barringtonia acutangula, Eucalyptus* sp.*, Saraca indica, Mesua ferrea, Melia sempervirens, Cassia siamea., Callistemon lanceolatus, Ficus elastica, Cucurbita moschata, Marmardica dioica, Zea Mays.* var *saccharata, Vigna sesquipedalis, Tamarindus indica, Aegle marmelos, Annona* sp.*, Acacia* sp.*,*

Areca catechu, Camellia sinensis, Elaeocarpus floribundus, Phyllanthus emblica, Manilkara achrus, Phoenix sylvestris, Spondias mangifera, Syzygium jambos, Syzygium samarangense.

Honey flow lasts for six months, December to May. Less honey flow for three months - June and October to November. The rest three months of the year, required food for bees for their own consumption is almost available in the country. In case of a big apiary, having more than fifty honeybee colonies, there is required artificial feeding in large amount. In other cases a little amount of artificial feeding is to be supplied as and when necessary. To utilize properly the six months honey flow and the other three months less honey flow for getting large amount of honey production and to minimize the artificial food supplement migratory beekeeping is a must for all the beekeepers round the year in Bangladesh.

Beekeeping – A potential Perspective for Rural development

In the context of agriculture based major employment and economy of Bangladesh, beekeeping as substantial and/or fulltime income generating source in a family based activity is very easy, acceptable and less expensive than any other income generating activities. Because beekeeping as a family based activity having 1-5 colonies does not requiere any specific land. Most of the time of a year there will be no need to purchase raw materials as honeybees collect nectar and pollen from the available source of existing natural bee plants.

Nevertheless it is unbelievable but true that the required technical labor per day for nursing 5 colonies may be about only thirty five minutes in average. Where as a beekeeper having 5 colonies could earn about Taka 1,000 per month in average.

It may be mentioned here that in most of the 86 thousands villages in Bangladesh beekeeping is more or less feasible on the basis of existing natural bee plants. So it is to be expected that if there would be at least 5 beekeepers in each village in average then there would be more than 0.4 million people to be engaged in beekeeping activities. By way of this 0.4 million people to be engaged in keeping bees and when each beekeeper on average will produce 10 kilogram of honey then there would be a total honey production of about 4,000 metric tons which is worth Taka 800 millions per year. On the other hand additional crop, vegetable and fruit production as per scientific record is to be worth Taka 8000 million by way of pollination through beekeeping activities in the country. So it is to be appreciable that through the scientific and proper implementation and expansion of beekeeping through Research & Demonstration in the country there will be a good amount of honey production with enhanced crop, vegetable and fruit production. Subsequently a large number of employment generation is also to happen as well.

Nevertheless, in the context of large unrealized potentiality of rural beekeeping in Bangladesh the following socio-economic benefits can be achieved:

- Promotion and enhancement of agricultural production.
- Enhance the quality and production of fruits.
- Promotion and expansion of forest wealth.
- Increase plant community in the environment.
- Save and/or earn foreign currency by producing and/or exporting honey and other bee products.
- Prevention of diseases by taking pure honey regularly.
- Cure some particular diseases.
- Promotion and increase the nutrition value of food.
- Use of wax and other bee products in various industrial products.
- Promotion of medicine quality.
- Upgrade the quality and standard of food in the view point of taste and nutrition.
- Increase the rural based cottage industry in the country.
- Family solvency through additional income broadly in the rural areas.
- New employment generation by way of rural beekeeping extension.
- Accelerate the development of national economy.

Beekeeping – Present status and future impact in Bangladesh

In Bangladesh, out of four species of honeybees under apini tribe of the largest animal group insects under the phylum Arthropoda two species namely *Apis cerana* and *Apis mellifera* are considered for modern and scientific beekeeping in the wooden box. The other two species namely *Apis dorsata* and *Apis florea* are also available in the natural condition of Bangladesh. It is not yet possible to keeping or rearing them in wooden hives for honey production and other related purposes.

Keeping or rearing bees are scientific. Its practical side is fully technical. This scientific beekeeping is started in some developed countries of the world in the 17th century. But in Bangladesh beekeeping is probably started in 1940. Efforts were very limited due to lack of technical knowledge. Then it was tried once again in

1950. The result was also not satisfactory due to insufficient technology and improper planning. In 1960 Bangladesh Small and Cottage Industries Corporation (BSCIC) has undertook the programme in the country. Efforts were not up to the mark due to in appropriate technology and as a result it was stopped in the same decade.

Later on, on the basis of past experience, BSCIC first introduced the modern and scientific beekeeping in 1977 in the country. And subsequently its promotion and extension was started to the target people mainly as a substantial income generating source. In the short span of time, beekeeping has been proved as a profitable venture having less investment of capital and small investment of skilled labor. However, since 1977 BSCIC has trained out or sponsored about 15 thousand beekeepers in the country. Realizing the successful efforts of beekeeping launched by BSCIC, many other organizations have already undertaken beekeeping programmes as a good weapon for self employment and poverty reduction as well. However till to day, there may not be more than 25 thousand beekeepers trained or sponsored by BSCIC including all other concerned organizations. Whereas the total number of beekeepers might be 0.4 million if there were 5 beekeepers in average in each village throughout the country. So the existing number of beekeepers till to day in the country appears to be very few in comparison to its potentiality.

Production of honey and other bee products

In the context of large potentiality of beekeeping in the agriculture and rural based economy of Bangladesh, production of honey and other bee products are not mentionable. However, at present honey and wax production per year in the country is only about 315 and 75 metric tons respectively. It may be several thousands metric tons per year. A few of the rural people are benefited for enhanced agricultural and horticultural production by way of cross-pollination through bees. Production and uses of other bee products are not yet undertaken scientifically. Although they might have a great potential in the country indeed.

Problems

- Improper, unplanned and unscientific use of insecticides and pesticides.
- Pest and Diseases.
- Non-availability of machinery, equipment, medicine and artificial feeding in respect of appropriate and modern technology.
- Lack of related information and institutional research.
- Scope of higher training and study tour on beekeeping is near about unavailable in the developing countries
- Ignorance of the farmers regarding the enhanced production crops, fruits, fibers, vegetables and seeds by way of cross-pollination with bees.
- Insufficient communication and co-ordination with the world authority and/or institution for the development of bees and beekeeping.
- Attention for restoration and expansion of bee plants community is not sufficient.

Recommendations

- Awareness should be created and appropriate steps should be taken by the world authority for beekeeping for proper, planned and scientific use of insecticides and pesticides.
- In most of the developing countries there should be a central information office, having direct communication with the world beekeeping forum and institutions.
- Research and demonstration activities for the promotion and extension of beekeeping are to be undertaken in many potential and developing countries of the world.
- To combat some identified and unknown diseases and pests more attention are to be drawn and steps to be taken.
- All authorities and/or countries should pay their highest attention for restoration and expansion of bee plants community in the world. It is indeed a great need for better environment for the world and mankind as well.
- Publicity of bees, beekeeping and all bee products through various means of communication are to be more strengthened internationally, nationally and on regional basis.
- Seminar/workshop/symposia on beekeeping are to be held in every potential countries of the world. For this, there should be a good link and/or technical assistance provided by the APIMONDIA, IBRA, AAA, etc. as and when appropriate.

- Steps to be undertaken for higher training and study tour/visit for beekeeper and beekeeping employee/scientists/researchers with the financial help of recognized international donor agencies to be organized by the world authority for beekeeping and developed countries as well.

Conclusion

Beekeeping is a vast scientific subject. Related to agriculture, food, nutrition, medicine, industrial products and environment, Bangladesh has a large unrealized potential for the production of honey, wax, crops, fruits and other bee products in the field of beekeeping. Four species of honeybees available and/or cultivated, multi-season plants and/or crops, ready local market and a large available labor pool. By utilizing all this advantages, there will be a unique opportunity for rural development through the promotion and extension of beekeeping in Bangladesh. As 80% of total population of the country lives in the rural areas and out of which 63% is depend on agriculture.

Finally, it is to be told that beekeeping in Bangladesh is a proven technology as good profitable venture requiring small investment of capital and skilled labors and high yield enterprise in comparison to other poverty reduction activities. Nevertheless, for rural development beekeeping can play a vital role as one of the economic activities for “One home on Farm” programme.

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