

Need for Apiculture Initiation in West Bengal: An Appraisal

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Abstract

There is no development without sustainability or no sustainability without development. Apiculture industry can have the ability for rural upliftment, self-reliance, production of daily needs of the people indigenously. Besides the benefits of Argo-based activity, apiculture is significant as it needs very little amount of money and equipment which can take place anywhere in rural or semi-urban areas as it does not require land. It is also practised for reasons apart from honey production. Some farmers tame bees to ensure the crops pollination, others keep bees to harvest honey and wax, and some farmers keep stingless bees for honey which is especially valued for medicinal purposes. Today, it is popularising as a subsidiary profession providing supplementary income to most of the farmers and to a large number of rural and tribal populations. Moreover, physically challenged individual, women and even landless people can earn a way of empowerment through this activity. Thus, apiculture is a useful capital of firming livelihoods and it has huge possible for poverty alleviation and justifiable use of forest resources. The main thrust of the paper is to judge the viability to establish apiculture initiation in West Bengal. Since West Bengal which ranks second in the national scenario of honey production and has diverse Agro-climatic zones, it has been selected as the study area. In west Bengal, a large-scale apiculture initiation is needed. Huge number of human resources, diversified climatic zones and varieties of corps cultivation as well as bee pasturages demanded apiculture initiations in West Bengal. Various NGOs, Cooperative Societies, KVIC and the Government have to take role of entrepreneur in this apiculture initiations.

Key Word: Apiculture Industry, Honey, Honey flow, Beekeeping and Livelihood.

Introduction:

Sustainable development, means "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" defined at the UN Earth Summit in 1992. Sustainable development, depends on itself, development and sustainability where both may have possibility to meet the future needs. There is no development without sustainability or no sustainability without development.

Apiculture industry can have the ability for rural upliftment, self-reliance, production of daily needs of the people indigenously (Bradbear, 2009, p. 1). Besides the benefits of Argo-based activity, apiculture is significant as it needs very little amount of money and equipment which can take place anywhere in rural or semi-urban areas as it does not require land. Thus, it helps to generate self-reliance and it has valuable font of income for poor peoples.

It is also practised for reasons apart from honey production. Some farmers tame bees to ensure the crops pollination, others keep bees to harvest honey and wax, and some farmers keep stingless bees for honey which is especially valued for medicinal purposes. Besides, recently there was a report from Laikipia Plateau in Kenya which highlighted as to how bees were being used as a 'living fence' to keep elephants away from small holdings (Evans, L.A. and Adams, W. M.,2016). Today, it is popularising as a subsidiary profession providing supplementary income to most of the farmers and to a large number of rural and tribal populations (Baidya, M. 2018). Moreover, physically challenged individual, women and even landless people can earn a way of empowerment through this activity. Thus, apiculture is a useful capital of firming livelihoods and it has huge possible for poverty alleviation and justifiable use of forest resources (FAO, 1990). By providing livelihood, such activities can meet the needs of the present and simultaneously can enhance the quality of nature for present and future generations which gives and will give them sustainable live and livelihood. As such there is a need of various initiatives at a global level to encourage apicultural practices which can help people to sustain and improve their livelihoods and at the same time, balance ecological biodiversity (Makerere University, Faculty of Agriculture, 2001, p. 17). The main thrust of the paper is to judge the viability to establish apiculture initiation in West Bengal. Objectives of this study are to appraise the present and past apiculture initiations in West Bengal and to judge the feasibility for apiculture initiation in West Bengal.

Rationalate Of The Study Area:

Since West Bengal which ranks second in the national scenario of honey production and has diverse Agro-climatic zones, it has been selected as the study area. On the basis of climate, soil and agricultural production West Bengal has been classified into six agro-climatic zones, namely the Hill zone, Terai zone, Old alluvial Zone, New Alluvial zone, Red and laterite zone

and Coastal and saline zone. Apart from high diversity in natural vegetation, there is huge crop diversity too. There are various types of crops like food grains, oil seeds, vegetable, fruits etc. in this state. Different food products grow in different Agro-climatological zones and are impacted by different degrees of changing the weather parameter (State of Environment Report, 2016, West Bengal Pollution Control Board). The agriculture sector in West Bengal is characterized by the predominance of minor and bordering agriculturalists (95.4%) who own 84% of the land with the per capita share of land being only 0.07 hectare. (State of Environment Report West Bengal, 2016). So, even being a predominantly agricultural state, the landless cultivators often take resort to parallel income opportunities like horticulture, pisciculture and apiculture as livelihoods.

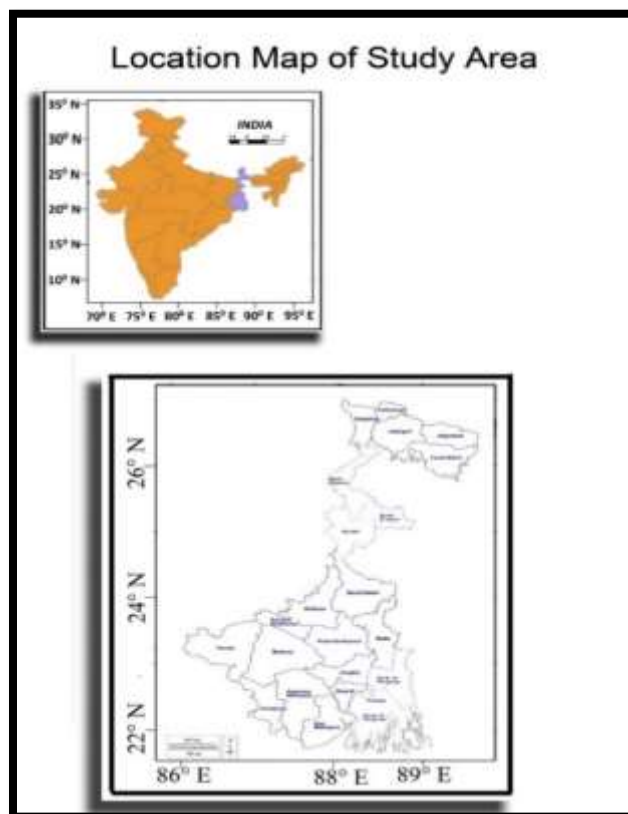


Fig:1 Location Map of study area

Objectives:

1. to appraise the present and past apiculture initiations in West Bengal.
2. to judge the feasibility for apiculture initiation in West Bengal.

Methodology:

Secondary data and primary data are used for this study. Extensive Literature survey, Journal, articles are used for secondary data. Compound Annual Growth Rate (CAGR) are used to identify the trend of honey production. Simple statistical tools have been used for data interpretation

Apiculture In West Bengal: Recent Past

The first state to introduce the modern beekeeping in India is Bengal in 1882. Mr. John Douglas, an employee of the Telegraph Department, Calcutta, kept the Indian bees in modern moveable frame hives in Calcutta and succeeded. After successful domestication of the local bees, he published a book entitled-“A Handbook on Beekeeping in India” in 1884. He described in his book that India had a great scope of apiculture. The book records his experience gathered from his Calcutta experiment contending that the Italian bees and the Indian bees could be kept in the English Standard hive following similar procedures. This according to him would ensure honey of excellent quality. Comparing the two bees (Indian native bees *Cerena* and Italian bees *Mellifera*), he admitted that the Italian bees were easier to domesticate and manipulate. To instil interest among the beekeepers to manufacture bee boxes and other appliances by using local resources, Mr. Douglas gave detailed descriptions of bee boxes and other implements in his book. Through his book he made a strong appeal to take up beekeeping in the country. He, however, recommended that the local bees should be kept in the country till the apiculture industry was well established and hoped that the Italian bees would be kept in future for large-scale beekeeping. Recently, the beekeepers of West Bengal too have started keeping Italian bees in their apiaries for a better output (Suranarayana, 1994)

After long gap, in the mid-1930s, modern beekeeping was introduced by Satish Chandra Dasgupta and Kshitish Chandra Dasguptas in Bengal. Inspired by the Swadeshi, Self-government and rural uplift movements of Mahatma Gandhi, Satish Chandra Dasgupta established an Ashram, Khadi Pratisthan, at Sodepur in 24-Paraganas, Bengal and took up

several cottage industries that could be developed in villages; out of which, modern beekeeping was one. Kshitish Chandra Dasgupta established a fine apiary of Apis Cerena bees in the Sodepur Ashram in 1936. British Standard and even locally made smaller boxes were used in that apiary. Thus, new methods of bee-keeping and honey production were promoted in the state which ensured adequate production of the honey on the one hand and on the other promoted sustainable development. Further, focus was made on training and providing various kinds of assistance to the beekeepers including the procurement of bee boxes and other appliances. A series of articles by Kshitish Chandra Dasgupta were published during 1939-1940 in the weekly "Rashtravani", which was issued from the Sodepur Ashram. Later, Kshitish Chandra Dasgupta wrote the book, "The Romance of Scientific Beekeeping", which was published by the Khadi Pratisthan in 1946 (Suranarayana, 1994).

In West Bengal, tradition of collecting honey from wild hives of Sundarban still continues. In this regard mention must be made of the Mouleys who are involved in the profession of bee hunting. Mouleys are forest dwellers in Sundarban who often risk their lives in pursuit of honey. In the quest of honey, which is uncertain the Mouleys are often injured and are even killed by Royal Bengal tigers, snakes or crocodiles. On top it, they are harassed by forest guards, BSF jawans and members of forest protection committee. Consequently, the coming generations of the Mouleys are disinterested in the honey hunting profession.

It is imperative to mention that honey hunting lasts for merely three months while beekeeping lasts around nine months. Since the span of honey hunting is limited, there is a need to make the profession a stable means of livelihood. As such it is necessary to blend Mouley's traditional practices with the modern beekeeping techniques. This, however, can be done by encouraging the Mouleys to practice the modern apiary by keeping standard bee boxes. Yet another problem persists as the modern beekeepers are still being harassed while migrating bee colonies from one place to another.

In West Bengal, KVIC has implemented various apiculture developmental programme through different district level cooperatives. Out of these cooperatives, only 24 Paraganas District Beekeepers Cooperative Society Ltd. continued not only as a successful beekeeping organization but also as a model cooperative society in India. Later a number of organizations took up apiculture activities like- Ramakrishna Mission sponsored Narendrapur Apiary, Narendrapur, South 24 Paraganas; Sundarban Khadi & VI Association, Canning, South 24 Paraganas; HUMAN (Healthy Universe For Man And Nature), Nagarukhra, North 24 Paraganas; Sri Ramkrishna Ashram, Nimpith, South 24 Paraganas; West Bengal Beekeepers' Association, Napara, Barasat, North 24 Paraganas; Abhoy Ashram Khadi & I. Activities, Birati, Kolkata and others. Dabur India (P) limited is also established their production unit in Narendrapur, South 24 Paraganas (Ghosh, 1994, pp. 11-12).

The apiculture industry's developmental activities are carried on by the co-operative societies in West Bengal in order to develop the economic condition in the region. There are seven active beekeepers' cooperative societies in West Bengal. They are-

1. 24 Parganas Beekeepers' Co-operative Society Ltd.
2. Baruipur Apiculture Industrial Co-operative Society Ltd.
3. Midnapore Beekeepers' Khadi & Village Industries Co-operative Society Ltd.
4. Bishnupur Subdivision Beekeepers' Women Cooperative Society Ltd.
5. Solo Mile Moumachhipalan Shilpa Samabaya Samity Ltd.
6. Malda Bee-Keeping and Honey Processing Industrial Cluster Co-operative Society Ltd.
7. Jalpaiguri District Bee Keepers Co-operatives Society Ltd.

Apiculture In West Bengal: Present Scenario

It is difficult to spatially divide the apiculture sector in the state as the beekeepers are mobile and migratory in nature coving almost the whole district seasonally. But based on production the major honey-producing districts have been identified -Maldah, North Dinajpur, South Dinajpur, North 24 Parganas and South 24 Parganas and are designated as the main honey flow areas. There honey flow period generally extends from September to end of April of next year, when the temperature is moderate and rainfall is very scarce. Many beekeepers from different districts of West Bengal migrate seasonally to these fields every year for honey collection. But the number of formally trained and registered beekeepers under the different co-operative bodies are only around fifteen hundred as informed by the various Apiculture Cooperative Societies, of West Bengal. Mustard, mango and litchi flowers are predominantly targeted for quality honey. The state of West Bengal has consistently ranked second in the country during the phase 2016-19 with positive compound annual growth rate (CAGR) while Uttar Pradesh leads the rank nationally (Table 1). Hence, modern beekeeping plays a vital role in West Bengal with positive growth rate indicating that apiculture has future sustainability.

Table 1: Status of honey production (in '000 tonnes) across India (2016-2019)

States	2016-17	2017-18	2018-19	Mean	SD	CV (%)	CAGR (%)	Rank as per 2018-19	Rank on Mean
Uttar Pradesh	17	18.9	22	19.3	2.52	13.08	0.09	1	1
West Bengal	15.8	16.5	18.5	16.93	1.4	8.27	0.05	2	2
Punjab	15	15.5	16.5	15.67	0.76	4.88	0.03	3	3
Bihar	9	10	15	11.33	3.21	28.36	0.19	4	4
Rajasthan	6	8.5	10.5	8.33	2.25	27.06	0.21	5	5
Himachal Pradesh	5.2	5.5	6	5.57	0.4	7.26	0.05	6	6
Haryana	4	4.5	4.8	4.43	0.4	9.12	0.06	7	7
Uttarakhand	2.5	2.7	2.8	2.67	0.15	5.73	0.04	8	8
Madhya Pradesh	2.15	2.25	2.55	2.32	0.21	8.99	0.06	9	10
Karnataka	2	2.1	2.2	2.1	0.1	4.76	0.03	10	11
Kerala	2.7	3	2.2	2.63	0.4	15.35	-0.07	11	9
Jammu & Kashmir	1.15	2.1	2.2	1.82	0.58	31.9	0.24	12	14
Tamil Nadu	1.8	1.9	2.1	1.93	0.15	7.9	0.05	13	12
Andhra Pradesh	1.7	1.87	1.9	1.82	0.11	5.92	0.04	14	13
Maharashtra	1.5	1.65	1.7	1.62	0.1	6.44	0.04	15	15
Odisha	1.25	1.35	1.5	1.37	0.13	9.21	0.06	16	16
Jharkhand	1.25	1.35	1.5	1.37	0.13	9.21	0.06	17	16
Assam	1	1.2	1.25	1.15	0.13	11.5	0.08	18	18
Chhattisgarh	0.65	0.75	0.85	0.75	0.1	13.33	0.09	19	20
Telangana	0	0	0.76	0.25	0.44	173.21	*	20	24
Nagaland	0.45	0.55	0.7	0.57	0.13	22.21	0.16	21	21
Gujrat	0.45	0.55	0.7	0.57	0.13	22.21	0.16	22	21
Sikkim	0.35	0.4	0.4	0.38	0.03	7.53	0.05	23	23
Manipur	0	0	0.35	0.12	0.2	173.21	*	24	27
Meghalaya	0.2	0.25	0.28	0.24	0.04	16.61	0.12	25	25
Mizoram	0.15	0.18	0.2	0.18	0.03	14.24	0.1	26	26
Tripura	0	0	0.18	0.06	0.1	173.21	*	27	28
Arunachal Pradesh	0	0	0.1	0.03	0.06	173.21	*	28	29
Others	1.3	1.5	0.28	1.03	0.65	63.73	-0.4	29	19
Total	94.55	105.05	120	106.53	12.79	12.01	0.08		

Population Profile Needs Apiculture Initiation In West Bengal:

Total populations (Table:1) of West Bengal are 91276115 out of which 46809027 (51.28%) are male and 44467088 (48.72%) are female (Census of India, 2011). Numbers of females per 1000 males are 950. Density of population per square km is 1028. Most of the people live in rural area (68.13%). The total population growth in last decade was 13.84%. The population of West Bengal forms 7.54% of India. Moreover, total 21463270 peoples are belonging to schedule caste and 5296953 peoples are belong to schedule tribe community. A huge no of population is non-working. Out of working populations, 9069725 peoples are marginal workers. Not only that, this working populations are mostly engaged in agricultural activities. Moreover, in West Bengal around 96 per cent land holding is with "Marginal and Small farmers" with less than 2 Ha land (Choudhury, 2016). There is a need of various initiatives at a state level to encourage apicultural practices which can help people to sustain and improve their livelihoods. The apiculture initiatives can eradicate poverty of the huge number of non-working and marginal population. It can able to reduce inequalities among caste, gender, rural and urban population.

Table:2 Population Profile of West Bengal (in number)

Event	Males	Females	Total
Population	46809027	44467088	91276115
Urban Population	14964082	14128920	29093002
Rural Population	31844945	30338168	62183113
Urban Sex Ratio	1,000	953	
Rural Sex Ratio	1,000	944	
Population Sex Ratio	1,000	950	
Literates	33818810	27719471	61538281
Schedule Caste	11003304	10459966	21463270
Schedule Tribe	2649974	2646979	5296953
Workers	26716047	8040308	34756355
Non- Workers	20092980	36426780	56519760
Main Workers (out of A)	21678279	4008351	25686630
Marginal Workers (out of A)	5037768	4031957	9069725
Cultivator (out of A)	4500041	616647	5116688
Agricultural Labourers (out of A)	7452814	2736028	10188842
Workers in Household Industry (out of A)	1114683	1349441	2464124
Others Workers (out of A)	13648509	3338192	16986701

Source: (Census of India, 2011), (Bureau of Applied Economics & Statistics, 2013)

Land Use Pattern Needs Apiculture Initiation In West Bengal:

Total available land in West Bengal is 8684 thousand hectares, out of which 1174 thousand hectares are forest area, 1733 thousand hectares are area under non-agricultural use, 21 thousand hectares are barren & unculturable land, 5 thousand hectares are land under Permanent Pastures & Other Grazing Land, 58 thousand hectares are land under miscellaneous tree groves not included in cropped land, 34 thousand hectares are culturable waste land, 22 thousand hectares are fallow land other than current fallow, 341 thousand hectares are current fallow and 5296 thousand hectares are cropped area (Fig:2). Not only the cultivated land areas or forest land areas, barren and unculturable land areas also important for beekeeping. Hence in west Bengal there is a huge scope of improving apiculture. Agriculture in West Bengal contributes considerably towards the country's annual crop production. Blessed with highly fertile lands and adequate irrigation facilities, Agriculture in West Bengal is characterized by high quality seeds and advanced farming techniques (Mapsofindia, 2013). In West Bengal there is scope for cultivation of diversified agriculture and horticultural crops harvesting the wide climatic diversity in different geographical regimes (Rabo India Finance Pvt. Ltd, 2005, p. 6). In West Bengal, there is a need of various initiatives to encourage apicultural practices which can help people to sustain and improve their livelihoods and at the same time, balance ecological biodiversity.

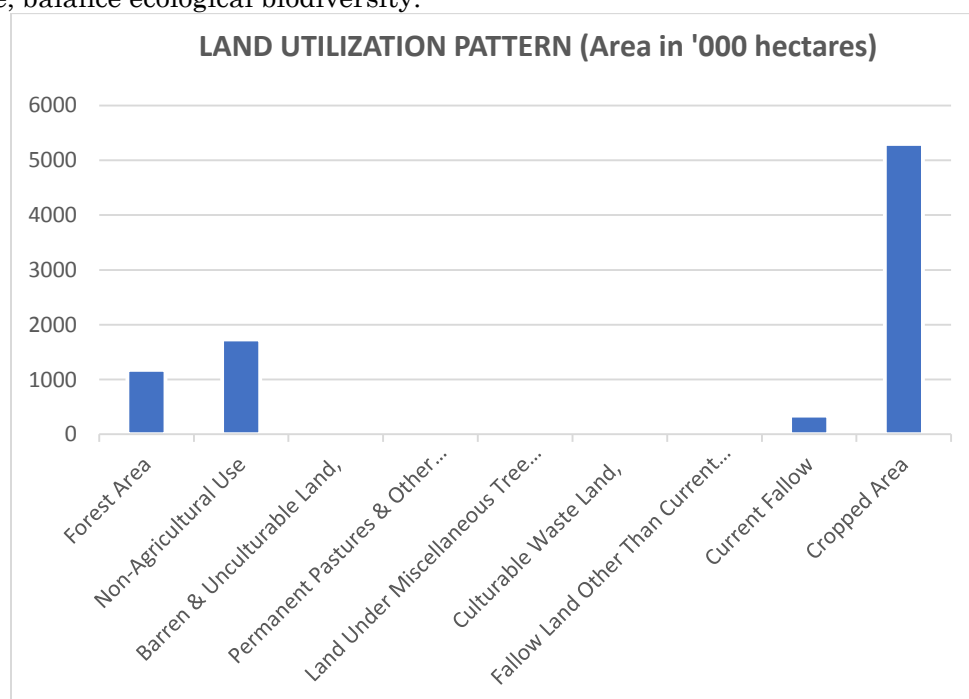


Fig:2 Land Utilization Pattern in West Bengal

Source: (Bureau of Applied Economics & Statistics, 2014, pp. 81-83) & (Rajarhat PRASARI, 2011, p. 8) (Forest Survey of India, 2009, p. 163)

Diversified Corps Need Apiculture Initiation In West Bengal:

Honey bees play very significant role for cross pollinating various agricultural and horticultural crops/plants which helps to increase the total production of crops as well as their quality. Beekeeping needs massive number of varieties of flowering plants and in modern beekeeping no region is self-sufficient for collecting honey. During migration beekeepers shifting their bee boxes in different areas with varying weather conditions which are suitable for different types of flowering plants. Still, many forests and even agriculture, horticulture farms remain unvisited by any pollinator due to lack of exposure. In West Bengal varieties of corps are cultivated in different parts. The state is a rich source of agriculture produces (Table:3). Important honey flow corps are Coriander, Eucalyptus, Mustard, Mango, Mangrove, Black cumin, Litchi, Sesame, Sunflowers and Khesari etc (Table:4). which are available in different part of West Bengal. Variety of flowering regions enrich West Bengal to get initiation in Apiculture activities.

With this diversified regions and corps variations, the state needs various initiatives to encourage apicultural practices which can help people to sustain and improve their livelihoods and at the same time, balance ecological biodiversity.

Table:3 Area Utilized for Agriculture and The Agriculture Production in West Bengal

Crops	Area (Thousand hectares)	Production (Thousand tones)	Crops	Area (Thousand hectares)	Production (Thousand tones)
Cereals	5903	16320	Marigold	6.33	53.42
Pulses	218	202	Jasmine	0.46	0.63
Oil Seeds	728	821	Seasonal Flower	4.75	7.83
Fibers	585	8312	Misc. Flower	2.83	3.36
Spices	76	123	Crops	Area (Thousand hectares)	No. of Cut Flowers (crores)
Plantation Crops (tea+)	140	279.30	Rose	1.72	79.36
Fruits	220.60	3172.50	Tuberose	5.17	121.87
Vegetable & Misc. Crops	417	13260	Gladiolus	2.65	39.70
Vegetables	961.35	13875.51	Chrysanthemum	0.50	13.36

Source: (Bureau of Applied Economics & Statistics, 2016)

Table 4: Important Honey Flow crops with region in West Bengal

Flower/Crops	Available in the Following Districts of West Bengal
Coriander	Murshidabad, Nadia, Hooghly and Birbhum
Eucalyptus	Bankura and Purulia and Bordar area of Paschim Midnapore.
Mustard	Mainly- Malda, Uttar Dinajpur and Dakshin Dinajpur districts. Besides- Murshidabad, Hooghly, Nadia, Birbhum, Burdwan and North 24 Parganas
Mango	Malda, Murshidabad, Nadia and both 24 Parganas
Mangrove	Sunderban region of both 24 Parganas
Black cumin	Murshidabad, Birbhum, Hooghly, Burdwan, Nadia, Bankura, Purulia and Paschim Midnapore
(Kul or Ber)	North 24 Parganas
Litchi	Mainly- South 24 Parganas, Murshidabad Besides- Uttar & Dakshin Dinajpur, North & South 24 Parganas and Malda
Sesame or Til	Murshidabad, Nadia, Hooghly, Burdwan and Birbhum
Khesari (Almorta)	Southern part of West Bengal
Sunflowers	South 24 Parganas, north 24 Parganas, Nadia, Bankura and Paschim Midnapore
Linseed	Nadia, Uttar Dinajpur, Cooch Behar, Jalpaiguri and Purulia

Source: Primary Survey, 2020- 2021

Conclusion and Suggestion:

Besides honey, apiculture gives us various by-products like beeswax, propolis, pollen, venom and royal jelly, which also help to create income. Apiculture is possible even by people having minimum resources and thus huge amount of self-employment are created by this industry. The vital point is that land ownership is not required for bee-keeper. Bees collect nectar and pollen from any field. Hence, wild-area, agriculture or horticulture land and even wasteland are valuable for beekeeping. Nectar and pollen are harvested only by bees, so there is no competition with other industry and simultaneously different sectors are benefited from a beekeeping industry. It encourages ecological awareness. Beekeepers want to conserve the environment so that flowers are available and bees are protected. Hence, beekeeping is eco-friendly as well as agro-based industry. In west Bengal, a large-scale apiculture initiation is needed. Huge number of human resources, diversified climatic zones and varieties of crops cultivation as well as bee pasturages demanded apiculture initiations in West Bengal. Various NGOs, Cooperative Societies, KVIC and the Government have to take role of entrepreneur in this apiculture initiations.

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