Ensuring Sustainable Livelihood of Tribals through Skill Development and employment Generation: An Action Research Programme in Wayanad, Kerala.

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Acknowledgement

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We are beholden to all especially the Kattunaickans of Begur for playing the role of enterprise owners.

SCIENCE & SOCIETY PROGRAMME

A. SUMMARY SHEET

1. TITLE OF THE PROJECT	Ensuring sustainable livelihood of tribals through Skill Development and employment generation: An Action Research Programme in Wayanad, Kerala.
2. PI & ORGANISATION	Dr. S. Sankar , Kerala Forest Research Institute, Peechi.
3. DATE OF START:	March 2010
4. TOTAL COST OF THE PROJECT:	7.625 lakhs
5. STAFF SANCTIONED:	Techinal Assistant (One)
6. TOTAL EXPENDITURE:	4.00 lakhs (Second installment of 3.625 lakhs not received)
7. EQUIPMENTS ACQUIRED, IF ANY:	Nil

8. SUMMARY OF PROGRESS MADE:

An action oriented project with a tribal group of honey hunters, was conducted in Wayanad forest area for training and capacity building aimed at skill development for livelihood improvement from 2009 to 2011 with financial support from DST, GOI.

Through a PRA meeting conducted in the landscape which was the abode of two tribal groups viz. Kurumba and Kattunaickan, the target group of honey hunters was identified. A group of 20 Kattunaickans (15 men and five women) were provided with training for two years and assistance in marketing honey.

The programme covered: Understanding ecology and quality of honey ,Estimating bee nests and impact of harvest, Base-line surveys and information on tools Methods of honey harvest, filtration, storage cans, honey harvest for processing, value addition packing and sale (training purpose).

Staff of Keystone Foundation, Kotagiri, provided immense support in realising the programme.

Although the group was provided with skill development and capacity building in honey based enterprise, the venture could not be sustained due to short project period and inadequate funding.

CONTENTS

1.0 Introduction

In India, natural honey and other forest products are collected and sold by local people, who do not always get a fair market price for their goods from traders. There are several reasons for this: the collectors are not organised; there is an over dependence on local traders because of an absence of multiple market channels; and their communities are marginalised due to a combination of caste-based exclusion and poverty suppressing their voice. It is estimated that 50-100 million people are directly involved in NTFP gathering for their livelihood, while over 500 million are indirectly involved (Tewari, 1998).

A major part of India's honey production, approximately 60,000 t per annum, comes from wild bees (Phadke, 2008). This honey is processed and sold. The Herbal industry is a major consumer and vendors are on the lookout for cheap sources of honey. Honey plays an important role in the livelihood of tribes family & economy as profits are high in a good season. Honey is usually in high demand and finds an easy market (Anitha Varghese et.al., 2015)

Organising the collectors has also enabled training to improve quality standard. For example, moisture meters are now being used to monitor honey quality before packing and at the level of collection (high moisture hastens spoilage and fungal growth).

Honey has a high potential in Kerala (cosmetics, medicine etc.) There are several types of indigenous and traditional hives including logs, clay pots, wall niches, basket and boxes of different sizes and shapes in modern beekeeping the combs are built on movable wooden frames. To promote tribal community through scientific, local and modern techniques as well maintaining biodiversity will be the prime strategy of the project. It envisages and promotes the beneficiaries who have been below the poverty line to eradicate poverty and enhance their economical status through income generation and biodiversity conservation. a resource of sustainable income generation. Tribal populations and forest dwellers have honey collection from wild honey bee nests as their traditional profession. The project mainly aims at well being and upliftment of tribal communities of Western Ghats's forest area, as even now the tribal community are in a very backward condition.

A development intervention was envisaged on wild collection viz., honey from *Apis dorsata* giant bees that seeks to balance livelihoods and conservation using research, enterprise and technology. Like many other Non Timber Forest Products (NTFPs) like medicinal plants, sources of a wild honey and identity of the gathering community remain untraceable in most cases. The anonymity of NTFPs once they enter the market, has a negative implications for understanding the ecological cost of harvesting from the wild. We attempt to introduce the forests, honey hunters and bees, we then proceed to sociological studies on honey hunters and the value chain analysis for honey. Finally, we train a group of honey hunters in locating broods, gathering honey, processing, value addition and marketing.

2.0 OBJECTIVES:

The study attempts to:

i. Organize and conduct training programme on scientific collection and processing of honey.

ii. Help the trained people to organize production/activities and market the product to sustain their livelihood.

iii. Conduct studies on: socioeconomic conditions of the stakeholders, livelihood improvement, problems relating to production and marketing of their product (honey) and employment level.

3.0 PROJECT AREA

Village : Begur

Block : Tirunelli

Area covered : 200 Hectors

4 .0 COMMUNITY BACKGROUND

In Thirunelli panchayat (study site) nearly 100 families are directly involved in the honey collection. From the training programme approximately 20 persons are expected to enhance their skill in sustainable collections and marketing of honey which enable them to augment their income. Attempt is also made to link this community to the local ecotourism programmes of the Forest Department.

A socioeconomic survey was conducted among the tribal settlements at Begur in Thirunelli Panchayats. The survey highlighted all Kattunaickan families to be living below the poverty line with a per capita monthly income of less than Rs. 500/-. Before the implementation of the project, on an average they got 10 days employment per month. With the implementation of this project, the number of days employed and per capita income of the participating tribals showed an increasing trend by 20-25 per cent. It is expected that at the end of the project about at least 100 persons will be benefited directly from this project. It is also expected that processed good quality honey will give at least 50 per cent more income to the collectors. In addition to increase of employment and income, the project will help to promote and strengthen indigenous skill and technology and micro-enterprises, resulting in enlargement of production base.

Tribals belonging to Kattunaikan and Kurumas reside in the region. Kurumas are agriculturists and foragers while Kattunaikans are the honey hunters. Table 1 depicts the population in detail of the afore mentioned communities.

Table 1 : Population Details

	Sex	No of persons
Kurumas	Male	6
	Female	10
	Total	**16**
Katunaickens	Male	28
	Female	8
	Total	**36**
Total		**52**

We selected 15 males and 5 females from Kattunaicken group for training and capacity building in honey business.

Wild honey plays an important role in the livelihood as illustrated in Table 2. More than 50 per cent of there annual income is from honey.

Table 2: NTFPs collected and its value by the tribal society in the study area during 2010

Sl.No.	**Product**	**Quantity Kg**	**Value Rs**
1	Cheenikka	10080	84450
2	Honey	21314	1278840
3	Beewax	82	7380
4	Kurumthotti	12681	64947.25
5	Chunda	29720	120103.3
6	Kalpasam	300	22500
7	Pachottitholi	16950	423750
8	Athithippali	610	6710
Total		**91737**	**2008681**

Source : TSCS, Begar

The selected group for detailed study is the Kattunaickans community in the Thirunelli Panchayath. The term 'Kattunaickan' implies king of the forests. They are considered to be the descendants of a nomadic primitive hunter-gatherer group. Kattunaickans are categorized as primitive tribal group because of their pre-

agricultural stage of development, low literacy rate and stagnant population. Their main source of income is collection of NTFPs, particularly honey from forests. Demographically, there is a predominance of females over males in their community.

Further, women participation in the production activities, women empowerment through better income, skill up-gradation to match market demand, test marketing and business promotion events, among others are other benefits of this project. Skill development and capacity building of the tribals will result in an increase in the awareness level and confidence among the tribals especially the women. Finally, effective implementation of the project will strengthen the Eco-Development Committee which will enable to conserve the nearby forest areas and development of rural economy

5.0 METHODOLOGY

A participatory research approach is undertaken in this study to generate data and on imparting knowledge on sustainable collection and marketing. Our project staff lives with the tribals and collects data. PRA is also used to collect data from the tribals. The project attempts to upgrade skills of selected tribals and impart training to innovative persons in learning skills in scientific harvesting and processing of honey. In the training programme the following aspects are taken care of:

1. Identification of enterprising persons for training in scientific collection and processing of honey
2. Introduction of new tools and process standards, and
3. Enhancing technical know how

Table 3: Schedule of training and capacity building

No	Subject
	Year 2010
1	Curtain raiser
2	Identification of enterprise partners
3	Understanding ecology and honey quality
4	Estimating bee nests and impact of harvest
5	Base-line surveys and information on tools
6	Methods of honey harvest, filtration, storage cans, Honey harvest for processing, value addition and sale (training purpose)
7	Setting up value addition units

8	Trial sales at tourism destinations
	Year 2011
1	Honey collection, filtration and processing
2	Value addition and packing
3	Sales at tourism destinations

The training programmes for the honey hunters was as per calendar provided in Table 3 above

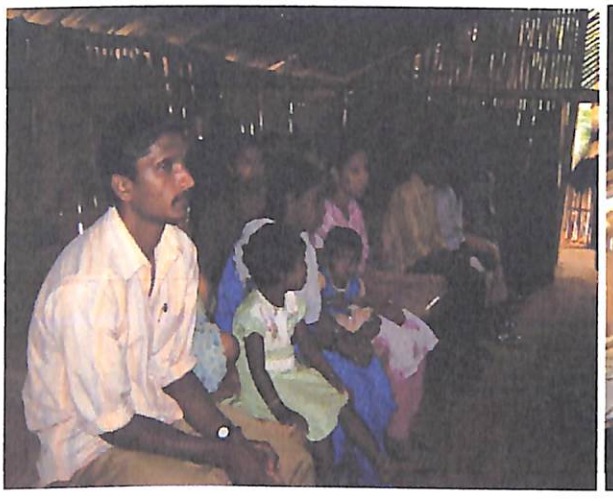

Plate 1: Curtain Raiser

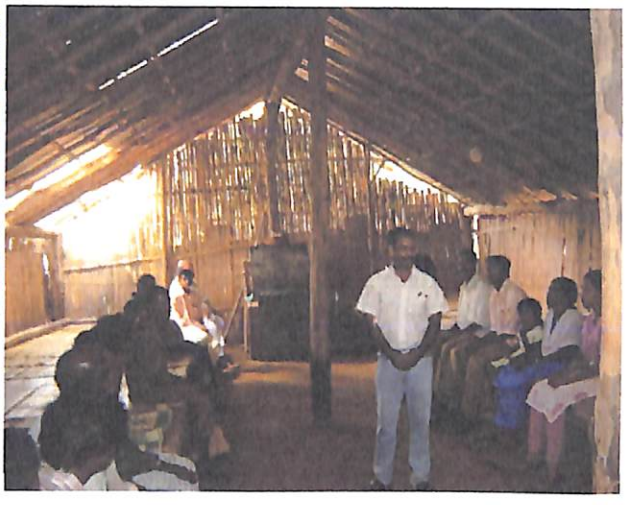

Plate 2: Ecology of Honey

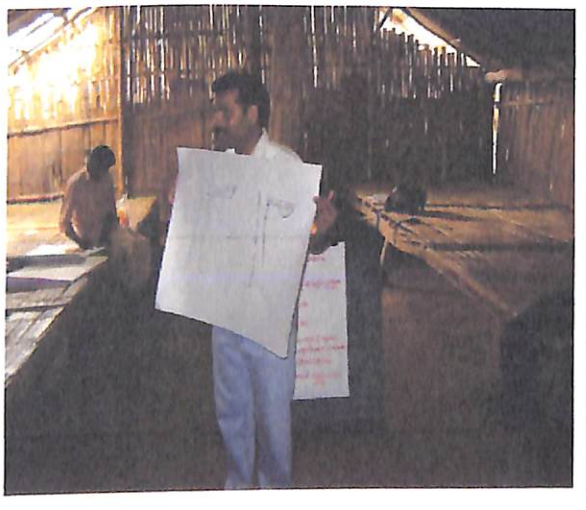

Plate 3: Ecology of Bees

Plate 4: Selection of group

Plate 5: After a hunt

The programme was organized in Begur. All programmes were exceptional in the sense that the enthusiasm displayed by the community members in attending the programme and taking part in the discussions, was noteworthy.

At every stage, the care and effort involved in making sure that the contamination from any external source was minimal, was re-emphasized. At dusk during the honey extraction season the group was taken to forest and methods of honey harvesting using new tools and methods was demonstrated live.

Later, the honey collected was brought to the village and methods of filtering, moisture estimation, hygienic handling, bottling, stamping and accounting and marketing were demonstrated.

6.0 TECHNICAL BACK-UP SUPPORT AND LINKAGES ESTABLSIHED WITH S&T INSTITUTIONS

The investigators received support and help from staff of Keystone Foundation, Kotagiri, which is a leading and pioneer organization in South India promoting sustainable and profitable wild honey business.

Keystone Foundation, a Non-Governmental Organisation located at Kotagiri, Tamil Nadu. Keystone started their operations with the indigenous communities of the Nilgiri Biosphere Reserve (NBR) in the year 1996. The idea for a livelihood intervention in the Nilgiris came up with a survey of the apiculture which the founders of Keystone took in the year 1994.

Keystone has been working in the Nilgiri Biosphere Reserve (NBR) since 1993 with indigenous communities on eco-development initiatives. During the last couple of years, several thematic areas have taken form, derived from the original idea of a holistic approach to the issues of livelihoods, conservation & enterprise. These are Conservation, Livelihoods, Indigenous Peoples Programme, Appropriate Technology, Research, Information and Communication, Knowledge and Capacity Building, Finance & Administration and the Crosscutting Programmes of Pollination,

Human-Wildlife Conflict, Water Resources, Health and Nutrition and Environmental Governance.

The project was tied to Keystone Foundation all though out. Staff of the foundation viz., Messers Leo and Saneesh and Dr Anitha Varghese were resource persons in training and enterprise development.

7. SCIENCE & TECHNOLOGY COMPONENT

The project dealt with the following which are related to science and technology:

1. Maintenance of sterile conditions as regards to equipments and honey.
2. Accounting and file management
3. Extraction of honey from honey combs
4. Determination of moisture content in honey
5. Value addition by adding various flavours

From the tree top to the consumer

Honey is valuable, yet a large number of adivasis seldom benefit from sale of honey products. Causes for this are many, but one rationale has been the poor quality of the honey that is displayed for sale while another is the exploitation by middlemen who purchase honey for low rates.

Presently, with the collapse of barter trade, harvested honey has two main purposes - Consumption at home and commercial sale market presence focuses on the urgency to have better quality mechanisms and an economically viable marketing system. We developed simple guidelines to ensure better returns for the actual harvester.

The process of value addition in honey is carried on while maintaining a strict regime of quality control. Focus on quality control should never waver. In addition, training is an excellent tool for capacity building and an area where large hearted efforts need to be put for achieving a superior product. The following explains various stages of processing and quality control mechanisms that need to be put in place at each stage.

Training and Capacity Building

The following subjects were dealt during the training and capacity building programmes:

Quality Control

Quality control **Stage of processing**

*QC I - Only *Apis dorsata* honey.

No mixing with *Apis cerana.* ---------- Harvesting Stage
Capped / Mature honey

QC 2 - Training for Non Squeezing ---------- Pre-Processing

QC 3 - Checking of ---------- Procurement at Centre

* Moisture Content
* Adulteration
* Freshness, Boiled Honey

QC 4 - Standard method of filtering -------Processing Stage

QC 5 - Ensure storage in recommended ----------Storage containers + temperature check

QC 6 - Check stamping, sealing---------- Stamping, Packing & Dispatch & marking
Quality Control -QC

Stage I - Collection and Initial Processing

The group traditionally processed honey in the wilderness using cloth tied to a branch. However, following experience of other enterprises viz., Keystone and to maintain a high level of cleanliness and hygiene the following steps were adopted:

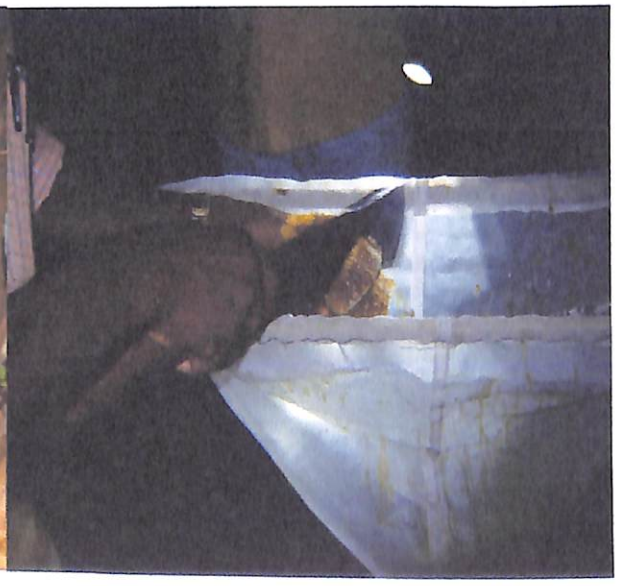

Plate 5: Cutting the comb

Plate 6: Filtering

_Plate 7: Combs into filter

Plate 8: Filter into vessel

- Take the collected comb to the village or a clean place in the forest.
- Carefully remove dead bees and dirt that might be attached to the comb.
- Keep brood and pollen parts separate.
- Cut along the mid rib as this leads to cutting both ends of comb and more honey drains
out without squeezing. Lateral, mid rib cutting of honey comb is highly advisable.
- Next, cut the honey comb into smaller pieces to drain out maximum honey.
- Tie comb pieces in a clean cloth and drain by gravity till all honey is drained out from the comb.
- The vessel for collection should be clean and dry.
- Do not underestimate the importance of cleanliness - of the hunter, tools and vessels.
- Store honey only in specified containers as improper storage can lead to contamination
through chemical reactions

Why honey should not be heated?

The temperature of a hive is around 34 degrees centigrade. Honey temperatures more than 34-40 degrees cause a rise in HMF (Hydroxy methyl furfural). Rise in HMF is hazardous to health and if there is upward deviation from 45-55 parts per million (a limit set by The World Health Organisation), honey is not accepted by most countries. - Honey is a thick solution and when it is heated, the transfer of heat is not equal over the entire volume of honey. This may result in burning of sugar crystals where heat is more intense and causes change in taste, flavour and chemical properties of honey. - Honey has natural yeast. This yeast may die when honey is heated.

Stage II - Value addition & Sales

There are two stages of quality checks for honey. First, the quality of honey is checked for predetermined parameters, during procurement. As the honey hunters arrive with their harvest from mid March onwards, honey samples are checked for moisture content which should not be more than 24 per cent. Each consignment of honey is marked and entered with details, such as, name of the person, group details, village, area collected from and so on. Besides, upon arrival, quality checks which validate the reliability of the person need to be performed. For a first time supplier, there must be more than one level of test:

- Checking moisture content
- Conducting chemical tests
- Cultural tests on the person's credentials

Experience suggests that the cultural tests are perhaps as important as the others as it becomes difficult for an unscrupulous person to hide his true roots and source of honey. After honey is collected, it is sent to the hive for processing which is described below.

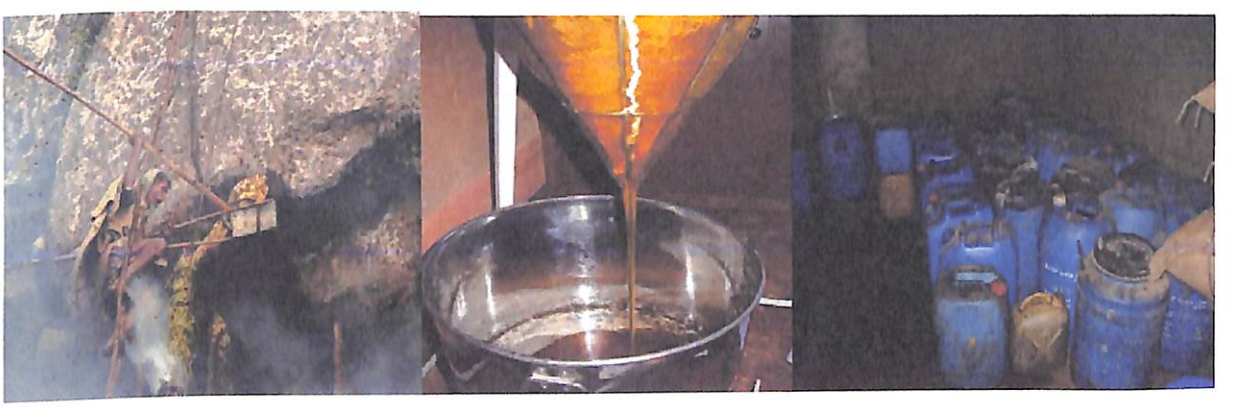

Plate 9: Filtering at unit

Plate 10 : Processing and packaging

Processing Honey

The processing of honey starts as soon as it is procured. Keystone's method of processing was accepted and is unique in a way that it does not use heat treatment or additives. This helps in retaining the natural characteristics and flavour of honey.

Filtration and Setting

Up to four layers of filter cloth are used depending on the pollen content and thickness of honey. No free fall of honey is permitted as it may lead to air bubbles and subsequently, leakage. This is highly unadvisable especially when honey is packed and transported across regions of differing atmospheric pressure, (air bubbles seek release and cause leakage when transported from a region of low atmospheric pressure to a region of high atmospheric pressure). Filtered honey is kept in a setting tank for 48 hours to remove air bubbles that might have remained when the honey flows down.

Packing and Sealing

Filling of honey by pouring is avoided. There is no free flow of honey into the bottle. Bottled honey is again allowed to settle and air bubbles escape before the bottle is finally packed for sale. After processing is over, honey is carefully packed with details such as, expiry date, origin of the honey and offered to the consumer.

Management of Honey

Honey must be handled carefully during all the stages of processing. Satisfactory processingis one of the key factors assisting the claim that natural unmodified honey is best in taste and quality.

- Honey with distinct taste and flavour to be stored separately
- Conversely, similar honey based on bee species, area, plant source and taste are stored together to effect continuity for each sample
- If pollen has to be removed, it is to be done using a butter paper which is lightly laid on top of the honey, tapped and removed
- Pack honey containing pollen separately for discerning customers
- Pack honey with differing moisture levels, separately
- Use simple multi-layered filters to increase efficiency
- Avoid air bubbles in packed honey
- Filtering in dust free and clean atmosphere
- Dryness to be maintained as honey is hygroscopic. Avoid packing during rainy days
- Keep honey raised above ground to prevent moisture seeping from below
- If honey is stored in a drum or earthen pot, layer the inside portion with bees wax
- Avoid direct sunlight to prevent bacterial activity

- Store in a cool and dark place

Squeezing the comb is not recommended because it:

- leads to mixing of larvae juice with the honey which results in fermentation
- involves use of bare hands which is unhygienic and unhealthy
- leads to mixing of pollen with honey which is not preferred by several people as it adds a grainy taste to the honey
- changes the composition of honey through impurity

The trainees were taught not to squeeze combs to extract honey as they used to do in the past.

The following practices were banned in the newly formed group of honey hunters.

Practices to be avoided -

The project identified the following practices which need be avoided.

– Squeezing of honey with hands
– Harvesting colonies that have not matured
– Overharvesting of colonies
– Harvesting honey with a high moisture content
– Working in moist conditions
– Unhygienic handling and Storing
– Mixing of different types of honey
– Using inappropriate containers to store honey
– Poor quality control during processing
– Not selling to a reliable dealer/market

8. PEOPLE'S PARTICIPATION FROM PLANNING TO IMPLEMENTATION STAGE

The Kattunaickan group selected for the programme participated in:

1. Designing and implementing the project
2. Managing each task and activity
3. Work sharing and training
4. Becoming resource persons
5. Book keeping and attendance
6. Sharing of profit
7. Maintenance of equipments and products.
8. Attempting to name products and brand them
9. Developing an enterprise

9.0 IMPACT ANALYSIS WITH INDICATORS

Two years of association with the honey hunting group in Begur resulted in the Following:

Identification of enterprise partners

Understanding ecology and honey quality

The enterprise partners were provided with lessons on ecology and quality of honey.

Estimating bee nests and impact of harvest

Honey bee colonies were identified in the landscape and hives were counted yearly. Between 2010 and 2011 there was a decline by a 50 bee hives in the landscape. Bees can with stand a level of harvest but major decline may be due to changing ecological factors (Climate Change)

Base-line surveys and information on tools

The enterprise partners were exposed to methods of surveying and impact assessment. For eg. When processed bottled honey was marketed(not sold as usual) there was an increase in value of honey (Table 4).

Table 4. Cost difference on sale of Honey(in Rs)

Year	Cost of Honey 1 Kg	Sold as	Total\ for 2000Kg For the group
2009	100	Raw , unprocessed In beer bottles	200000
2011	350	Filtered, bottled, labelled and stamped (in 100, 200 and 500 g containers)	700000

(primary data estimates)

It can be seen that there was a3.5 fold increase in revenue, which has a direct impact on livelihood,

Methods of honey harvest, filtration, storage cans, Honey harvest for processing, value and setting up value addition units and sale (training purpose) during first year.

Honey harvesting methods were demonstrated in field. All equipments, tools and instruments were provided by Keystone Foundation on loan till the group purchased on their own.

Training at source of collection- taking on to account the prevalent quality standards of the honey, training was provided to improve the handling to promote more hygienic and less destructive methods of harvest. Methods of honey harvest with minimum damage to the comb and cutting the combs along the mid-rib so that honey will drain out naturally without having to squeeze the combs were promoted. Simple filters and storage cans were provided to honey hunters. By this honey went through a value addition at source itself.

Value addition and packing

Setting up of value addition units at enterprise level enabled it to sell the products locally. Filtration, moisture estimation and bottling in hygienic containers which were stamped aand labelled as natural honey from forests enabled value addition, (Table 4)

Sales at tourism destinations

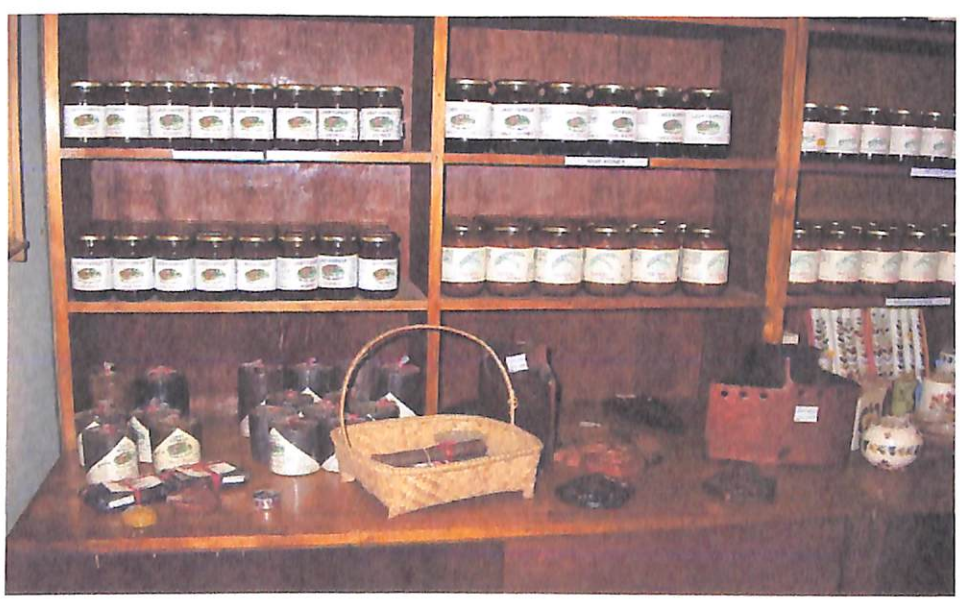

Plate 11 : Sales counter at eco shop

Tholpetty located near Begur is a tourism destination where visitors come from Kerala and Karnataka to observe wildlife while taken on a jeep safari. The Honey was sold at Tholpetty to visitors and higher profits were obtained (Table 4).

The project had immense impact on the community per se and also neighbouring groups. It also was appreciated by staff of Forest Department and Tourism and Tribal Departments. It was appreciated and regarded as a model project for livelihood improvement of tribes and other forest dependant groups.

The project was considered feasible in forest conditions and with tribes who are not exposed to developing enterprises.

It upgraded the skill of honey hunters in gathering ,processing, value addition and marketing high quality honey.

It introduced them to accounting and book keeping methods.

The indicators of success were:

1. Knowledge in new methods
2. Managerial skills
3. Work sharing
4. Maintenance of standards

10. SPECIAL FEATURES:

1. No new technology was generated
2. The methods applied were new to the honey hunting community
3. The equipments were of low cost
4. The method of honey extraction was environmentally friendly
5. Many neighbouring communities came to learn the techniques of honey harvesting, storge and value addition.

11. APPLYING FOR PATENT, IF ANY:

NIL

12. INDICATORS APPLIED FOR MONITORING:

The indicators of monitoring were:

1. Knowledge in new methods
2. Managerial skills
3. Work sharing
4. Maintenance of standards

13. FOLLOW UP ACTION (POST PROJECT):

Nil

14. CONSTRAINTS & SUGGESTIONS:

The marketing and establishment of a unit which is self sufficient in all aspects of management have been incomplete due to short project period and non availability of sufficient funds.(second instalment of grant).

For achieving the high sounding objectives the project requires more funds and time.

15. CONCLUSION:

The Kerala Forest Research Institute has made interventions in Begur people in the fields of sustainable harvesting, hygienic filtration and processing of the honey, quality parameters, improved marketing and value addition.

Annexure

Literature :

Cited

Anitha Varghese, Snehalata Nath, Robert Leo and Sumin George Thomas, 2015- The road to sustainable harvest in wid honey collection-in Shackleton et. al.,(Eds), Ecological sustainability of Non Timber Forest Products. Earth Scan from Routledge,104-115.

Phadke R P. 2008. A background paper on honeybee products. In: Workshop report on Role of Apiculture in increasing crop yields in Horticulture, pp.13-16. Pune, India.

Tewari D D 1998. Economics and management of Non Timber Forest products: A case study of Gujarat, Indi, Oxford and IBH Publishing, India.

Referred

The Keystone Handbook on Honey Hunting, 2006. Keystone Foundation

Honey hunting in the Nilgiri biosphere Reserve, 2007 Kunal Sharma, Keystone Foundation, Tamil Nadu, India.

Keystone Foundation. (2001). Honey hunters and Beekeepers of Tamil Nadu. Keystone Foundation, Kotagiri, The Nilgiris, India.

Keystone Foundation. (2005). Forests, Honey and *Adivasis*, A report on traditional use, livelihood and Markets in the Nilgiri Biosphere reserve. Keystone Foundation, Kotagiri, The Nilgiris, India.