



**USAID | GHANA**  
FROM THE AMERICAN PEOPLE

## BEEKEEPING IN THE COASTAL LANDSCAPE OF WESTERN REGION, GHANA



**COASTAL SUSTAINABLE LANDSCAPES PROJECT**



**CSLP** *AUGUST 2018*

This document was produced for review by the United States Agency for International Development Mission for Ghana (USAID/Ghana). It was prepared by US Forest Service International Programs.

For more information contact:

**Coastal Sustainable Landscapes Project**

Plot 18, Quashigah Avenue, Anaji-Takoradi.

Postal Box MC 3407, Takoradi, Ghana

Email: [info@cslp-gh.org](mailto:info@cslp-gh.org)

Tel: +233 (0) 31 229 7824

**Steven Dennison (PhD)**

Project Director

[director@cslp-gh.org](mailto:director@cslp-gh.org)

+233 (0) 263982961

**Adam Welti**

Africa and Middle East Program

Forest Service

International Programs

Office of the Chief

p: 202-644-4568

c: 202-617-8560

[adamjwelti@fs.fed.us](mailto:adamjwelti@fs.fed.us)

1 Thomas Circle NW, Suite 400

Washington, DC 20005

[www.fs.fed.us](http://www.fs.fed.us)

**Citation:** USFS-IP (2018): Beekeeping in the Coastal Landscapes of Western Region, Ghana, 16pp

**Compiled by:** Kwame Appiah Owusu

**Disclaimer:** This publication is made possible by the generous support of the American People through the United States Agency for International Development (USAID)/Ghana. The contents of this report are the responsibility of the Coastal Sustainable Landscapes Project (CSLP) and do not necessarily reflect the views of USAID or the United States Government. Agreement Number: AEG-T-00-07-00003 for “Coastal Sustainable Landscapes Project (CSLP) for the Western Region of Ghana

## Table of Contents

<b>1. BACKGROUND</b>	<b>1</b>
1.1 Introduction	2
<b>2. METHODOLOGY</b>	<b>3</b>
2.1 Community Sensitization and Enrolment of Prospective Beekeepers	3
2.2 Trainings	3
2.3 Supply of Start-up Items	4
2.4 Short-Term Consultancies	4
2.5 Training/Education Tour	5
2.6 Regular Monitoring and Advice on Best Management Practices	5
<b>3. RESULTS</b>	<b>6</b>
3.1 Training Output	6
3.2 Establishment of Apiaries	7
3.3 Best Management Practices	7
3.4 Honey Production and Processing	8
3.5 Marketing for Honey	8
<b>4. DISCUSSIONS</b>	<b>10</b>
<b>5. CONCLUSIONS AND RECOMMENDATIONS</b>	<b>13</b>
5.1 Conclusions	13
5.2 Recommendations	14

## LIST OF TABLES

Table 1: Trainings conducted and number of participants disaggregated by gender .....	4
---	---

## LIST OF PHOTOS

Photo 1: Classroom type of training (A) and field based hands-on training (B) .....	3
Photo 2: Tour participants at an apiary in Atebubu District .....	5
Photo 3: Theresa Mpraim's apiary in a secondary forest at Adubrim .....	7
Photo 4: Kofi Anyigla in photo 1A showing his bottled honey also shown in photo C. In 1B, Kofi is in the middle in full protective clothing few minutes before harvesting of the honey begun.....	8
Photo 4: Kofi Anyigla in photo 1A showing his bottled honey also shown in photo C. In 1B, Kofi is in the middle in full protective clothing few minutes before harvesting of the honey begunC .....	8
Photo 5: Exhibits of major insect pests of honey bees in the coastal landscapesA .....	12
Photo 5: Exhibits of major insect pests of honey bees in the coastal landscapes.....	12

## APPENDICES

Appendix 1: Communities and Number of Beekeepers disaggregated by men and women.....	15
Appendix 2:Outline of training modules.....	16

## 1. BACKGROUND

The Ghana Coastal Sustainable Landscapes Project (CSLP) is a United States Agency for International Development (USAID) Feed the Future initiative and a U.S. Forest Service-managed intervention being implemented in the six coastal districts<sup>1</sup> of Ghana's Western Region. The project, originally a three-year project (2013-2016) funded with USAID Climate Change monies, was extended initially for another three years through September 2019<sup>2</sup> with Feed the Future funding, based on successes achieved within the initial phase. It worked to promote low emissions development in Ghana's Western Region by strengthening community-based natural resource management and monitoring, and improving livelihoods in farming and fishing communities.

The project's second phase, under the U.S. government's Feed the Future Initiative, had a specific objective to reduce poverty and increase resiliency in the target communities through improved natural resource management, livelihood diversification, value chain development, and ecosystem conservation and restoration. The project interventions covered 43 core coastal communities with smallholder farmers and fisher folks as the main beneficiaries. In total, project actions of one sort or another had reached more than 82 communities as of early June 2018.

The interventions of the CSLP were guided by two main outcomes: (i) increased incomes from livelihood diversification and, (ii) improved environment and natural resource management. Specific activities included agroforestry and forestry best practices, short- and medium-term livelihood improvement activities (e.g. beekeeping, climate smart agricultural, CSA, vegetable production), on-farm tree planting of commercial and agroforestry species and management of greening areas / urban greeneries. Others included wetland/mangrove conservation, spatial planning, Village Savings and Loan Associations (VSLAs) and youth engagement (via formation of environmental clubs in public schools).

The CSLP used in-field consultations, targeted trainings, strategic capacity building, detailed technical assistance, and participation in institutional/policy level discussions and workshops based on field-level experience to achieve project objectives.

---

<sup>1</sup> Shama, STMA, Ahanta West, Nzema East, Ellebelle and Jomoro Metropolitan/Municipal/District Assemblies (MMDAs)

<sup>2</sup> This was subsequently reduced to only two years, to September 2018, due to lack of financial resources in USAID/Ghana's budget

## 1.1 Introduction

Beekeeping was recommended as a livelihood intervention through rapid appraisal of community needs and stakeholders' validation at an early stage of the CSLP. This intervention feeds into the two outcomes of the CSLP. It was learnt community assessments that deforestation and degradation of trees on farm landscapes has led to decline and scarcity of wild honey. Community members could not afford to buy scarce honey for basic health and nutritional needs. Meanwhile, local people used honey for food and traditional medicine. Some wild honey collectors also used to earn incomes from sale of wild honey but their unsustainable harvesting practices have killed bee colonies. Hence beekeeping was chosen by some farmers as additional livelihood option to develop.

Despite the important role wild honey played in the livelihoods of the farmers there was practically no capacity within the Coastal landscape of the Western Region to start beekeeping. Therefore beekeeping was introduced by the CSLP to farmers and it is being practiced in the coastal landscape with the following win-win objectives:

1. To train farmers to adopt beekeeping as additional livelihood activity for increasing their incomes.
2. To incentivize farmers to conserve secondary forest and fallow lands for reducing greenhouses emissions (avoided deforestation and degradation) and increasing biodiversity.

## 2. METHODOLOGY

Methods and strategies used to introduce and build capacity of farmers in beekeeping as an additional livelihood activity and others DoFA extension agents as service providers are briefly explained in this section.

### 2.1 Community Sensitization and Enrolment of Prospective Beekeepers

As part of participatory appraisal to select additional livelihood activities that have potential for income generation, beekeeping became prominent. Community members were sensitized on the benefits of beekeeping as well as requirements for starting successful beekeeping on the landscape. Persons interested in beekeeping were registered<sup>3</sup> for training and other capacity building activities.

### 2.2 Trainings

The CSLP developed training curricular which had three main modules. An outline of the content of training modules is presented in Appendix 2. Three types of training namely i) lectures and discussion (**Error! Not a valid bookmark self-reference. A**), ii) field hands-on and coaching (**Error! Not a valid bookmark self-reference. B**), and (iii) training tours were used. The objectives were to;

1. Introduce beekeeping as a livelihood option with a win-win outcome for improving natural resources management (avoided deforestation and biodiversity conservation) and economic benefits to practitioners (farmers);
2. Provide essential knowledge and skills for interested persons to be able to



Photo 1: Classroom type of training (A) and field based hands-on training (B)

successfully set-up and manage apiaries for economic<sup>4</sup> and ecological benefits.

<sup>3</sup> Public announcement about the registration was made in all communities

<sup>4</sup> Tangible economic benefits expected are honey for sale income



As shown in Table 1, a total of 214 individuals were trained on module 101 (i.e. introduction to beekeeping). However, the number of participants was less in all other training modules.

One unique training module was construction of Kenyan Top-bar Beehive. This training was conducted for six artisans (carpenters) selected from Ellembelle district, Jomoro District and Sekondi-Takoradi Metropolitan area. This strategy was used to ensure availability of local artisans to produce quality beehives to meet demands for bee hives. Prior to the CSLP, there was no known artisan with the skill to manufacture Kenyan Top-bar beehive in the Western Region.

Table 1: Trainings conducted and number of participants disaggregated by gender

No.	Title of Training	Training Participants		
		Men	Women	TOTAL
1	101: Introduction to Beekeeping	181	33	214
2	102: Setting up & management of apiaries	177	33	210
3	Construction of Kenyan Top-bar Beehive	6	0	6
4	201: Harvesting and Processing of Honey and Bee Wax	176	32	208
5	Education tour to Samreboi (Sax Honey)	22	6	28
6	Honey harvesting refresher (hands-on)	79	14	93
7	Training tour to Atebubu for beekeepers	12	5	17

### 2.3 Supply of Start-up Items

The Project provided start-up items to trained beekeepers. The items included one bee hive with stand, bee suit with attached veil, a pair of hand gloves with gauntlet, and piece of bee wax for baiting bee colonies. This strategy was used to incentivize adoption of the intervention within the shortest possible time.

### 2.4 Short-Term Consultancies

Consultants were given specific short term assignments by the CSLP to provide specific training support especially at the initial phase of this intervention. Three consultants with different specializations in beekeeping handled theoretical and practical aspects of training for apiary set up, construction of beehives and hands-on regarding honey harvesting and best management practices. In January 2017, another



consultant was assigned to assess challenges of beekeeping in coastal landscapes and make recommendations for alleviating identified challenges.

### 2.5 Training/Education Tour

Two training tours were organized. The first training tour to Oda-Kotoamso and Samreboi area took place in February 2015 for 25 selected beekeepers to learn about Sax Honey's partnership with farmers in commercial beekeeping enterprise. The second tour was organized for 17 promising CSLP trained beekeepers to Atebubu-Amantin district. For this tour, the aim was to enable the beneficiaries to learn from experiences of successful individual beekeepers who were members of the Atebubu Beekeepers Association related to all aspects of the training modules (Photo 2).



*Photo 2: Tour participants at an apiary in Atebubu District*

### 2.6 Regular Monitoring and Advice on Best Management Practices

Regular monitoring visits with beekeepers to their apiaries were carried out twice a year. Monitoring visits helped beekeepers and the CSLP field staff to identify and rectify potential problems in the apiaries. It also enhanced the number of visits made by the beekeepers to their apiaries. Community Assistants (CAs) also provided the necessary support to ensure beekeepers diligently monitored their hives regularly.

### 3. RESULTS

This section outlines key outcomes of training, coaching and adoption of recommended practices as well as honey harvested.

#### 3.1 Training Output

The Project trained 214 individuals. From Table 1 a total of 214 individuals were trained on module 101 (i.e. introduction to beekeeping). However, the number of participants was less in all other training modules.

Training participants were largely farmers (93%) on the landscape while the remaining 7% were selected staff persons from Ghana government institutions such as Ministry of Food and Agriculture (MoFA), Forest Service Division (FSD) and Wildlife Division (WD), etc. This latter group participated with the understanding that they will take practical interest in beekeeping and therefore be capable of advising community level beekeepers in the near future.

Training local artisans on construction of Kenyan Top-bar Beehives has proven to be a worthwhile initiative. About 90% of beehives currently on the landscape were made and supplied by CSLP-trained local artisans. Apart from beehives purchased by the CSLP from these vendors, individual beekeepers have also purchased some beehives from these artisans especially Stephen Sakitey of Fawoman in Jomoro Municipal.

Training tour to Atebubu Beekeepers' Association and its selected members' apiaries has resulted in high motivation to increase number of beehives in apiaries in the coastal landscape. For example Clement Edema of Mangyea community purchased eight beehives to install in his apiary one week after returning from the tour. Others who have added more beehives to their apiaries, constructed by themselves, are Obed Cobbinah of Yabiw, Kofi Musah of Krobo, and Stephen Sakitey of Fawoman. Again Matthew Badu<sup>5</sup> of Fawoman had already expanded the number of beehives in his apiary from two to five prior to the tour, but added three more bee hives after the tour.

Another significant result of the training tour is that Peter Ackon and Ignatius K. Acheampong of Yabiw, who did not participate in the training tours learned lessons from it shared by Obed Cobbinah (tour participant). With guidance from Obed, both

---

<sup>5</sup> Matthew Badu has harvested and sold honey for three seasons (i.e. 2016, 2017 and 2018). He bought his personal stainless steel bee smoker in July 2018.

Peter and Ignatius have added 13 beehives constructed by themselves to each of their apiaries.

Moreover, as a result of the training tour beekeepers in Fawoman, Adubrim, Ayawora and Krobo have started organizing themselves to form associations in their respective communities. Having built network among the beekeepers who participated in the tour, it is expected that with the lessons from Atebubu, a district level or landscape level beekeepers association could be formed in the near future.

### 3.2 Establishment of Apiaries

One hundred and eighty-four (184) out of about 214 trained individuals (86%) have established apiaries on the coastal landscape as a result of CSLP's capacity building program on beekeeping. In addition to this number of farmers who have established apiaries, the Ellebelle District Department of Food and Agriculture (DoFA), has established one apiary with two beehives to serve as training site for prospective beekeepers in the district. About two-third of apiaries were established in secondary forest and fallow areas where trees have been planted in strips (see Photo 3 for an example of such apiaries) Training participants who have not yet established apiaries are DoFA staff and few farmers who could not get appropriate site to set up apiaries or were no longer interested in beekeeping.



*Photo 3: Theresa Mpraim's apiary in a secondary forest at Adubrim*

### 3.3 Best Management Practices

Training module 102, focused partly on best management practices necessary for beekeeping. Beekeepers have progressively adopted recommended practices through field coaching by the CSLP staff and knowledgeable CAs. Beekeepers encountered several challenges in the early establishment stages of their apiaries leading to absconding of bees from recently colonized hives. But having applied additional best practices recommended by a CSLP hired consultant, the beekeepers have improved management of apiaries. Hence more than 80% of apiaries have honey bee colonies that have continuously stayed in their hives for more than two years.



### 3.4 Honey Production and Processing

Eighty-seven (87) CSLP-supported beekeepers have harvested honey once or twice from their apiaries since 2016. The total volume of honey yield is 235,000 ml for the



*Photo 4: Kofi Anyigla in photo 1A showing his bottled honey also shown in photo C. In 1B, Kofi is in the middle in full protective clothing few minutes before harvesting of the honey begun*

period March 2017 to May 2018 only (i.e. an average of 2701 ml beekeeper<sup>6</sup>). The highest volume of harvest per hive was obtained from Kofi Anyigla of Aketakyi (Photo 4) and Elizabeth Eshun<sup>7</sup> of Tumentu – both in Ahanta West Municipal.

### 3.5 Marketing for Honey

All the honey harvested so far were locally sold immediately after processing. The average producer price of GHS40.00 per litre higher than GHS30.00 that pertains in many parts of Ghana. At this stage of low volume of honey from developing beekeeping enterprises, trainings on marketing was basic; focused on factors and practices that could maintain honey quality for long period. Through monitoring of honey harvesting and extraction practices, it was observed that beekeepers adhere to

<sup>6</sup> Calculation was based on the 87 beekeepers who have ever harvested honey from CSLP supported apiaries.

<sup>7</sup> Elizabeth Eshun inherited an apiary from her late husband, Kofi Attah three years ago. She was then given hands-on training to manage the apiary on her own.

practices that ensure quality standards. Some of these practices include using equipment dedicated solely for honey for extraction, extracting honey in clean environment, avoiding honey coming into contact with water (or diluting honey), etc. Packaging of honey using appropriate home manual bottling techniques has been a standard practice for those who sold their honey.

## 4. DISCUSSIONS

Practical and field based trainings such as education tour play important role of increasing motivation and confidence of prospective beekeepers to start up, learn by doing and subsequently leads to success in beekeeping. Without hands-on trainings and coaching, interest of the beekeepers would have waned. Nonetheless, basic knowledge on the ecology of honey bees should be thoroughly imparted to amateur beekeepers and to reinforce rationale for apiary best management practices. For instance, training on life cycle of honey bees and pests such as wax moths and ants has helped beekeepers to better manage pests in apiaries.

A training method that uses video clips to honey harvesting and extraction proved useful. Considering the fact that it is a recommended practice to undertake honey harvesting in the night, using video clips helped to reach more trainees at a time. It was also a good strategy to allay fears of bee stinging on the part of inexperienced beekeepers. Although video clips were effectively used to reinforce comprehension of key knowledge and skills, videos that are were based on different ecologically settings had to be explained further to make them locally relevant. Ideally good video clips on night harvesting in Ghana, if available, must be used to initiate practical training.

Promotion of beekeeping in a landscape where know-how was virtually non-existing has been a slow process. It took about three years for prospective beekeepers to learn and adopt beekeeping practices to the micro-climatic conditions of the landscape. Unlike in the dry forest and savanna zones of Ghana, honey bee colonies in the coastal landscapes experience frequent and intense rainfall for about 10 of 12 months per year. This appears to lower rate of honey storage by honey bee colonies as worker bees spend more time in their beehives to avoid death in the rain. It also causes high variability in harvesting season making it difficult for beekeepers to do viable harvesting. To overcome this seasonal uncertainty for harvesting honey, beekeepers have to constantly inspect hives, study colony behavior to determine when good yield of honey could be harvested. For instance, at Aketakyi and Tumentu in the Ahanta West District when it was observed that honey bees were busily foraging on Para rubber (*Hevea brasiliensis*) flowers during heavy flowering season (i.e. February – April), hives were inspected a month after the flowering season. This led to successful harvest of honey in two apiaries with a total volume of about 18,000 milliliters. Hence honey yield could be higher in the Ahanta-West District landscape dominated by Para-rubber than in other areas without significant rubber plantations. Again, it was learnt that there was no pesticide application at the two Para-rubber plantations where the apiaries were located.

Beside the high yield, quality parameters of honey such as color and taste were favorable. Thus honey realized from the two apiaries was sold for cash the same day it was processed. Since then there has been high demand for this type of honey from individuals who have seen exhibits and / or tasted this type of honey. Some members in the Ghana Beekeepers Association WhatsApp based group asked for information about investing in beekeeping in the Ahanta West area. The enquirers have been provided with contact information of selected beekeepers in the district.

On creating conservation and avoided deforestation co-benefits with beekeeping, most apiaries have been set up in secondary forest and fallows which are no longer intended for cultivation. An appreciable number of different timber species have been planted in most of these apiaries through enrichment planting technique<sup>8</sup>. It has been observed that plant diversity has increased and vegetative cover of most of sites have improved. Apiaries sited in secondary forests are less susceptible to adverse effects of pesticides application near the site.

Major challenges to apiary management identified include invasion of bee hives by wax moth and various species of ants as well as unregulated pesticide application in the landscape. Given the fact that the inland areas of the coastal landscape is dominated by cocoa farms where pesticides are frequently applied, honey bee colonies are exposed to pesticide toxicity and death. In some communities, where apiaries were sited in secondary forests and fallows near cocoa farms, sudden abandoning of hives by bees in those apiaries was observed. To reduce this threat the beekeepers relocated their apiaries away from farms where they could not control spraying of pesticides. This has proven to be a good practice since the incidence of honey bee colony collapse has reduced significantly if we compare 2018 to previous two years.

Regarding wax moth and ants, beekeepers have gradually adopted good management practices. These include frequent monitoring visits to the apiary to clean the immediate hive surroundings of weeds and to remove dead leaves and wood on the top cover of the hive to prevent brooding by wax moth. This has decreased reported cases of wax moth attack and subsequently absconding by honey bee colonies comparing previous years 2016, 2017 to 2018.

Establishment of apiaries by Ellebelle District DoFA and Shama Senior High School as training demonstration sites will go a long way to help training prospective beekeepers in the coastal landscapes. These sites could be supported by the Regional

---

<sup>8</sup> Farmers clear about 1.5 meters strips through vegetated areas and plant seedlings on them without destroying desirable matured trees that fall on the strips. This is to increase the number and / or types of timber trees on the plot.



MoFA and the Business Advisory Centers of the respective districts, in order to serve this purpose.



The left photo (A) shows invasion of bee hive which was not colonized by ants and photo on the right (B) shows wax moth attack on a colonized bee hive.

*Photo 7: Exhibits of major insect pests of honey bees in the coastal landscapes*

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

The CSLP has demonstrated that beekeeping can be used as an approach to diversify farm and landscape based livelihoods for enhanced incomes concurrently with improving natural resources management. To apply this tool effectively, beekeepers must be trained in basic knowledge on life cycle of honey bees, their living environment, and skills for effective management of honey bee colonies.

Through the CLSP imparting requisite knowledge on available protective equipment and skill building on effective use of bee suits, bee veil, hand gloves, closed shoes, etc. an inertia arising from fear of bee sting was overcome. This was reinforced by the free supply of these start-up items financed by the Project. As a result, the number of beekeepers increased by about 100% in the second and third year. Moreover, education tour to successful beekeeping enterprises also increased motivation and commitment of inexperienced beekeepers to expand their apiaries, adopt best practices, so as to help increase honey and wax production.

The CSLP has supported about 190 farmers to become practitioners of beekeeping. In fact, without free supply of one set of start-up items to each of the trained beekeepers, the number of beekeepers would have been less than 10% of the current number. The existing beekeepers are currently diligent in following recommended best apiary management practices and therefore have successfully harvested honey in the past year. Honey production is not a given once a person sets up an apiary. Practitioners need to ensure that hives are sited in conducive places slightly shade but free from insects like ants, termites and moths. Bee hives must also be protected from reptiles and pesticides application. The CSLP-supported beekeepers need to undertake regularly visits (once-twice every month) for two main reasons. The first reason is to enable them detect emerging problem before it gets out of control and the second reason is to easily assess foraging behavior of honey bee colonies to determine when honey is matured for harvesting.

Successful harvesting of honey has spurred some amateur beekeepers on to increase the number of beehives in their apiary. Therefore from one beehive per farmer that the CSLP supplied, there is now about 50% increase in the number of beehives in the landscape. Whiles some CSLP-trained beekeepers have 13 beehives, others are yet to add one or more to the one the Project supplied.

## 5.2 Recommendations

From experiences gained and lessons learnt through implementation of beekeeping as intervention with win-win outcome for livelihoods and improved natural resources management, recommendations have been provided as follows:

1. To enhance early appreciation of the prospects of beekeeping and early adoption of best practices for beginners, capacity building activities must be led by education tour to successful beekeeping sites/enterprises.
2. Considering the role of honey bees as important pollinators, more education should be given to farmers on safe use of pesticides that highlights avoiding pesticide risks to pollinators.
3. Potential beekeeping investors could partner with Para-rubber plantation owners or CSLP-supported beekeepers in the landscape to expand and establish more apiaries near their plantations. Considering the fact that rubber tapping and other related activities is almost zero during flowering season, there is better niche for beekeeping in Para-rubber plantation business. Again Ghana Government's program of "Modernizing Agriculture in Ghana) could also invest in beekeeping in the Ahanta West Municipality. This could be targeted at current and prospective beekeepers living around the Cape Three Points Forest Reserve.
4. Future projects could promote establishing apiaries using local inexpensive materials. Adhering to strict standards for hives, often results in expensive hives that farmers cannot afford to buy thereby limiting apiary expansion potential. To effectively do this, local training should be provided for farmers to explore all options available to them.

## APPENDICES

*Appendix 1: Communities and Number of Beekeepers disaggregated by men and women*

Community	NUMBER OF BEEKEEPERS WITH APIARIES		Total
	Men	Women	
Adubrim	33	5	38
Adusuazo	5	0	5
Aketakyi	3	1	4
Allabokazo	1	0	1
Alloakpke	2	0	2
Ampain	2	1	3
Asonti	11	0	11
Ayawora	11	5	16
Azuleti	1	0	1
Bokro	9	0	9
Cape Three Points	1	1	2
Ebonloa	2	0	2
Fawoman	7	2	9
Fiasolo	6	2	8
Kamgbunli	5	0	5
Kanokware	2	0	2
Krobo	11	0	11
Mangyea	2	0	2
Metika	2	0	2
Navrongo	11	6	17
Old Bakanta	1	0	1
Old Kablensuazo	2	0	2
Samenye	1	0	1
Sendu	11	3	14
Tumentu	2	1	3
Tweakor I	10	2	12
Tweakor II	1	0	1
<b>TOTALS</b>	<b>155</b>	<b>29</b>	<b>184</b>

**MODULE 101: BASICS OF BEEKEEPING**

1. Background of beekeeping
  - a. Reasons for beekeeping: Products and services
  - b. Approaches to beekeeping
  - c. Values of beekeeping
2. Basic Honey Bee Biology – life cycle and social divisions
3. Products that can be harvested from apiaries?

**MODULE 102: SETTING UP AN APIARY AND EARLY MANAGEMENT**

1. Choosing and making a bee hive
2. Where to keep bees / siting an apiary
3. Foraging by honeybees – preferred plant species
4. Obtaining colonies
5. Beekeeping Equipment/Tools and Their Uses
6. Maintenance of hives and apiary
7. Seasonal management
8. Pests and diseases and their management
9. Handling Bees – Safety Issues
10. How to determine when to harvest honey?

**MODULE 201: HARVESTING AND PROCESSING OF APIARY PRODUCTS – HONEY AND WAX**

1. Inspection of hives to determine maturity (What must be done and equipment needed)
2. Removing and cutting combs from the top bar
3. Small scale processing of honey (organic)
4. Basic packaging of honey
5. Processing of bees wax