



PARTNERS FOR RESILIENCE



Impact of Bee Keeping on the Community in OTUKE District

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List of Acronyms.

AA	ApiTrade Africa
BfD	Bees for Development
CBT	Community Based Trainers.
CCA	Climate Change Adaptation
DR	Democratic Republic
DRR	Disaster Risk Reduction
EU	European Union
FAO	United Nations Food and Agricultural Organization
KTB	Kenya Top Bar
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
MT	Metric Tonne
NAADS	National Agricultural Advisory Services
NALIRI	National Livestock Resources Research Institute
NEMA	National Environmental Authority.
NGO	Non-governmental Organization
PfR	Partners for Resilience
TUNADO	The Uganda National Apiculture Development Organization
UBOS	Uganda Bureau of Statistics
UEPB	Uganda Export Promotion Board
UIA	Uganda Investment Authority
UK	United Kingdom
UNBS	Uganda National Bureau of Standards
US	Uganda Standard
USA	United States of America
USD	United States Dollar

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The great role played by the bee keepers in Otuke as Household respondents was very critical in the success of this assignment. They validated the study findings in the validation workshop and travelled long distances to have the Focus group discussions with the consultant.

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Executive Summary.

By the end of Phase I of the project, 37 (22 female and 15 male) bee farmers trained were earning a minimum of 292,200 Uganda shillings (Ugx) in a season from sale of honey. In 2014, 15 of the bee keepers formed and registered the “Otuke Bee Keepers Association” at Olilim Sub County. The association, focused on information sharing on bee keeping, bulking honey, marketing, advocating to district Local Government to provide technical backstopping and scale up bee keeping. It is from this background that the project contracted a private consultant to document the effects of bee keeping on livelihoods and environment. The purpose of this study was to:

- i. Document benefits, opportunities, value chain of bee keeping to incentivize community engagement in sustainable management of wetlands and forests
- ii. Recommend optimal interventions for the community to promote in bee keeping as a lucrative practice to generate income, manage and restore ecosystems

The results of the study was meant to inform the team implementing phase II of the project (2016-2020) which focuses on integrating risk management measures in policy, investments and scaling up the good risk management measures of phase 1.

Highlights of Key Findings:

A total of 132 bee farmers were successfully interviewed of which 48.1 % were farmers who were not part of care pilot but were attracted along due to the impact of the groups of care on the ground, followed by 36.5% who were trained by CARE and 15.4% were those directly recruited and trained by the team trained by CARE during the Pilot in 2011.

There was great increase in terms of numbers of community members now involved in bee keeping right from 2011 – 2017 (75.2%) as compared to 7.6% (before 2000) and 17.2 % in (2010). This is because honey from the bees is highly treasured as a source of income, food and also for medicinal purposes.

1. Economic Benefit.

(7.4.%) of the total respondents visited who had been trained are harvesting larger volumes of honey in return and earning between 500,000 Ugx – 700,000 Ugx per season as compared to the end of project time when the best farmers were earning 296,000 Ugx. Those who bought KTB were inspired by the training from CARE and support given which positioned them into a place of earning lucrative harvests even using the local hives. 23.2% harvesting twice earn about 360,000 Ugx – 470,000 Ugx.

However there is still great concern for the largest percentage (67%) of the respondents that had an average of 3- 4 hives. Their annual income is about $(4 * 73,150 \text{ Ugx} * 1 \text{ harvest season}) = \underline{\underline{292,600 \text{ Shillings}}}$. It is worth noting that a Hive well managed with good bee care practices is able to give honey at least every (3 months and 2 weeks) implying that the earning from the honey could triple for all these bee farmers using the traditional hives.

2. Biodiversity and Environmental conservation benefits.

Bee farmers are conserving indigenous tree species because indigenous trees produce the best flowers which results into high quality honey. Shea butter tree in particular is said to produce the best flower for honey production. Trees are habitat to vast number of species like insects, avifauna, creeping plants, soil microbes forming a completely unique ecosystem.

Areas where hives are hanged comprised of mainly indigenous woodlots and grasses. The keystone species identified were; shea butter tree, *Ficus mucuso* (Annar/ Ananga), *Acacia Senegal* (Achika/ Okuto), *Hyparrhenia filipendula* (Ogali), Ayekayek/ Itek, *Vitex doniana* (Owyelo/ Owelo.) among others. Wetland plants species were also observed in the low-lying and waterlogged areas. The prominent grassland species identified included; *Hyparrhenia filipendula*, *Echinochloa pyramidalis*, *Nandi setaria*, *Setaria pumila*. Wetland species observed were; *Cyperus dives*, *Typha domingensis*, *Typha capensis*, *Lossiah cuspidata*, and water lily.

Secondary forest of indigenous tree species and scattered thickets were observed to be emerging. This is interrupted by wetlands plants in the lowland and farmlands. The bees' behavior is very sensitive to their environment. When there is plenty of food, bees make honey to eat later on when there is little food. The beekeeper shares in this stock of food. Manipulating the colony to be at the peak strength at the right time is fundamental to good beekeeping.

On the other hand, the bee eating bird; white-throated bee eater (*Merop albicollis*), the ants are looked at as pests to bee keeping and are killed yet these are important in ecological processes e.g. the ants are very good decomposers of organic matter. *The basic solution for these birds is using traps, catapults, nets, bow and arrow, Regular inspection and clean apiary. Planting repelling plants like spear grass and 'Odugu' leaves for snakes and other reptiles, Fresh ash to control crawling pests like safari ants, grease on the stands of the hives to prevent small and big ants, old car oil at the base of the poles to prevent termites and Destroying ant nests and using metallic stands because ants don't move on metals.*

3. Honey Flow. (Value Chain Analysis).

Raw honey flows through three different channels (refer to the Value Chain Mapping)

The first channel(I), takes up to 15% of the raw honey and it links producers directly to retailers. The main end market is normally retail outlets in Lira and along high ways like Kamdini. This market earns the bee farmer about 9,000 Ugx after semi processing but there is a challenge with producing enough volumes since only very few farmers(about 7%) produce good quality honey.

Channel II is dominant of the (beekeepers) who engage themselves in small-scale processing and packaging. This Channel absorbs 85% of the honey produced by Otuoke farmers. The main distribution centers are Schools, Churches and local weekly markets. It is less profitable and is characterized by low volume and poor quality honey harvested just locally. But the reality is that there is very high demand for honey locally as food.

Through Channel III, 10% of honey is sold as combed and semi-processed to both processors and producer processors. These main actors are the independent large scale farmers (30 – 50) hives as

per the village standards. They process and sell in larger scales that is packed and sold to the Regional Markets as well.

4. Optimal recommendations for care and its partners.

By addressing constraints affecting the value chain efficiency will be increased and supply stability achieved. Major constraint areas identified during the study hinged around Input access, production management, marketing support to harness the current opportunities. The following areas provide opportunities for strengthening the whole honey supply chain:

- I. *There is need to support the local artisans who are already in the community and part of the group. There major constraints are in access to materials for making the hives and yet there is high demand for improved hives in the community and many travel long distances to buy these hives. So setting up a group that will get Technical support from the district entomologist to ensure that the hives are designed in good technical specifications will be of great help to these farmers.*
- II. *The groups should be supported to increase on the volumes at individual household level. This can be done by working with the group leaders to make sure that each bee farmer has at least 30 hives for a start. This will greatly improve on the income of each bee farmer since we have already seen that there are those managing over 50 hives and are doing very well. This will also create a great linkage between the artisans producing the hives under the Project support and the farmers providing the market but will also be a base for making the farmers attract bulk buyers at the district.*
- III. *There is great need to scale up the training that was done at the beginning of the project since more farmers have joined. This can be done using a contract farming model where we engage some bulk buyers to support this farmers with training but also provide a forward market for the produce. This model will make care and its partners as value chain facilitators to stabilize the marketing chain while mentoring the groups to supply the international markets which they have already accessed.*
- IV. *There is need for guiding the farmers on developing their forage and feeding bees so that better quality honey is got. This also provides opportunity for promoting agro forestry and Afforestation. Each family will be encouraged to plant trees around their gardens and the project can work with the district programmes to enables access to seedlings or make other members take up the business of seedling production.*
- V. *Incentivize beekeepers through facilitating the joint development of a bee keeping Procedure document for the local Government demarcated land to promote protection of forests and promote establishment of beekeeping reserve areas in and around the forests. This will help in creating a good relationship between the district and bee keepers as they support and protect these areas and also know the magnitude of the Honey production in Otuke.*

1.0. Introduction.

Otuke district experiences annual flash floods and prolonged dry season. Some of the coping mechanisms by communities to the shocks is unregulated charcoal trade, bush burning which further contribute to risks of soil loss, degradation of environment and conflicts. CARE, implemented the phase I of the **Partners for Resilience project (PfR)** in Otuke district from 2011-2015. The project targeted 12,000 persons in two sub counties out of 8 in Ogor and Olilim sub counties. The goal of the project was to ‘**reduce the impact of hazards on vulnerable communities**’. The project objectives were to increase the resilience of communities to disasters, climate change and environmental degradation; increase the capacity of civil society organizations (CSOs) to apply disaster risk reduction (DRR), climate change adaptation (CCA) and ecosystem management and restoration (EMR); make the institutional environment from international to grass root level more conducive; and to integrate disaster risk reduction, climate change adaptation and ecosystem – based approaches.

Under the ecosystem management and restoration approach, bee keeping was one of the main activities prioritized and implemented by communities. The purpose for this was to promote sustainable use of the environment, reduce unregulated degradation for charcoal and diversify livelihood options in fragile ecosystems areas. By the end of the project, 37 (22 female and 15 male) bee farmers trained were earning a minimum of 292,200 Uganda shillings in a season from sale of honey, sensitizing communities on bee keeping, training peers, mentoring adopters, processing honey and turning bee wax into candle. In 2014, 15 of the bee keepers formed and registered the “**Otuke Bee Keepers Association**” at Olilim Sub County. The association, focused on information sharing on bee keeping, bulking honey, marketing, advocating to district Local Government to provide technical backstopping and scale up bee keeping.

Now the project has embarked on phase II (2016-2020) which focuses on integrating risk management measures in policy, investments and scaling up the good risk management measures of phase I. It is for this that the project contracted a private consultant to document the effects of bee keeping on livelihoods and environment. The purpose of this study was to:

- iii. Document benefits, opportunities, value chain of bee keeping to incentivize community engagement in sustainable management of wetlands and forests
- iv. Recommend optimal interventions for the community to promote in bee keeping as a lucrative practice to generate income, manage and restore ecosystems

1.1. Methods and Approaches used in the study.

The study was carried out in November 2017 in the Sub Counties of Ogor and Olilim. A total of 132 bee keepers were interviewed. A comparison of the differences between the current ecological condition and the status by baseline data was done to ascertain the effects on Biodiversity, value chain analysis, SWOT analysis methodologies were used to assess the economic and social benefits of the intervention. 63 % of the respondents of the study were from Ogor Sub County and 37% from Olilim. The study generally spanned over 16 villages in the district

- i. To measure the improvement in the environmental condition or impact of the intervention A comparison of the differences between the current ecological condition and the status by baseline data. An ecological evaluation tool was developed to assess the degree of impact of different types of land use on the area taking into account three variables: soil, structure, and biodiversity.
The measure of arboreal and non-arboreal species was done through visual observation and observation of fauna associated with the ecosystem was another indicator of its status and dynamics over time that was taken into account.
- ii. An assessment of the training contents and immediate impact on the lives of the people was assessed taking into account both qualitative and quantitative indicators.
- iii. Value Chain Mapping.
Mapping the monetary value throughout the chain was used to answer the key question: How does the value change throughout the chain? Value was measured by looking at the value that is added at every step throughout the chain. Deducting the differences led to an overview of the earnings at the different stages. Other economic parameters like revenue, cost structures, profit and return on investment were also considered.

1.1.1. Sampling Strategy.

Multi-stage sampling techniques were used to arrive at the sample of respondents in the selected district and Sub Counties. Simple Random sampling, value chain analysis and SWOT analysis methodologies were used to achieve the objectives. The respondents included mostly the value chain players; input suppliers, bee keepers, bulkers, processors, transporters (who also doubled as traders), processors, exporters, wholesalers, retailers and consumers.

The target number of respondents was determined using purposive sampling. This was chosen based on the prior information about the sector and also given the nature of study. Other factors like the distribution of these stakeholders was also taken into consideration for cost effectiveness.

A total of 132 respondents out of the targeted 140 sample size target participated in the study giving us a sample coverage of 94.3%. These consisted of Leaders in the District (Chief administrative officer, Production and agricultural officers, Environmental officers), Partners, Project supported bee keepers, Other bee keepers, Processors and traders, Supermarkets in Lira and Kampala, Government officials and Officials from the Apex regulatory body of apiculture.

1.1.2.Data Collection Procedures.

The study adopted the use of four data collection tools namely; questionnaires, KIIs and Ecological checklists and FDG Value Chain Analysis Tools.

1. Questionnaires

This is a tool that the researcher administered to the bee farmers who were part of the group trained at the launch of the pilot project in the existing sites and other farmers in the district who are not part of this pilot group but also bee farmers. A total of 85 bee farmers out of the initial 95 targeted were successfully interviewed at household level. 52.9 % who comprised the majority were farmers who were not part of care pilot but were attracted along the issues due to the impact of the groups of care on the ground, followed by 29.4% who were trained by CARE and 17.7% were those directly recruited and trained by the team trained by CARE during the Pilot in 2011.

2. Key informant interviews.

Using structured interview guides, value chain constraints and opportunities were identified during interviews with value chain participants. The preliminary interview guide (Interview Guide for Value Chain Analysis) was used to identify constraints and opportunities faced by the players in the value chain. A total of 29 major players who could be accessed within the study timeframe were interviewed. These comprised of Policy regulators (MAAIF), Researchers like Ngetta ZARDI, Regulators like TUNADO, Processors, etc. These play major roles in the Apiary sector in Uganda.

3. Focus group Discussions.

The analysis entailed sub sector mapping, analysis of margins and costs, linkages and governance issues, identification of constraints and opportunities and strategic options particularly how the target group beneficiaries should be integrated. 2 FGDs were carried out and each had between 13 – 25 members in each FGD in the different subcounties. The composition was a mixture of youth, Women and Men in the same sitting. The respondents were from both gender i.e. 65.4% and 34.6% males and females.

4. Field study site visits.

This was aimed at obtaining a broader understanding of existing Ecological and Biodiversity related issues. The ecological evaluation tool was used to assess the degree of impact of different types of land use on the area and changes in Biodiversity.

1.2. Data Analysis and reporting Structure.

The data involved impact stories that was analyzed using most significant change methodology, qualitative data was coded and summarized in a thematic way aligned with the objective of the study, quantitative data was coded and entered in SPSS software and analysis was done using descriptive statistics techniques.

Secondary data analysis was done on information gathered from the literature of related reports and information obtained from secondary data sources and analysis of policy documents.

1.3. Validation of findings.

To reduce on possible inconsistencies and bias; the project team, Local leaders, Otuke Environmental and Entomology department officers and 15 different Bee farmer group leaders from the different areas were involved in a one-day validation workshop of the first draft findings of the study. Through this the research team was able to produce the final report.

Below is a picture taken during validation of the Partners for Resilience's bee keeping pilot project workshop on 12th December 2017 with the Care Staff, Community based trainers(CBT) , New district Entomologist, Community Development Officer(DCDO) , Chief Finance Officer(CFO) and leaders from the different bee keeping communities.



2. Field results and impact of the project.

2.1 Social and Demographic Characteristics of the respondents.

The above socio demographic factors were investigated during the study because they were found to have an impact on the whole bee farming business. The different variables of Age, Gender, Educational levels and training affected participation across the whole value chain where considered and the results are as summarized in the Table 1 below:

Table1: Socio demographic characteristics of respondents

Parameter	Category	Percentage(n=132)
Type of Household	Trained by care	36.5
	Not trained by care	48.1
	Trained by care trainees	15.4
Gender of Bee keepers	Male	65.4
	Female	34.6
Age Grouping (Yrs)	<18	1.9
	18-30	28.8
	31-40	38.5
	>41	30.8
Educational Level	No formal education	7.7
	Primary	38.5
	Secondary	40.4
	Tertiary	9.6
	Degree and Above	3.8

Source: Field data 2017.

The findings showed that there is great participation by all groups; those <18 years (1.9%), 18-30 years (youth) comprised 28.8%. Those between 31 -40 years also comprised the highest percentage (38. 5%).Even Older members above 41years also contributed a good number. This differs from other studies by the Ministry of Agriculture, Animal Industry and Fisheries (2009) and UNDP, 2012; on apiculture value chain in the West Nile region, which found out that most of honey work is only for men and Women without youth and Teens involvement.

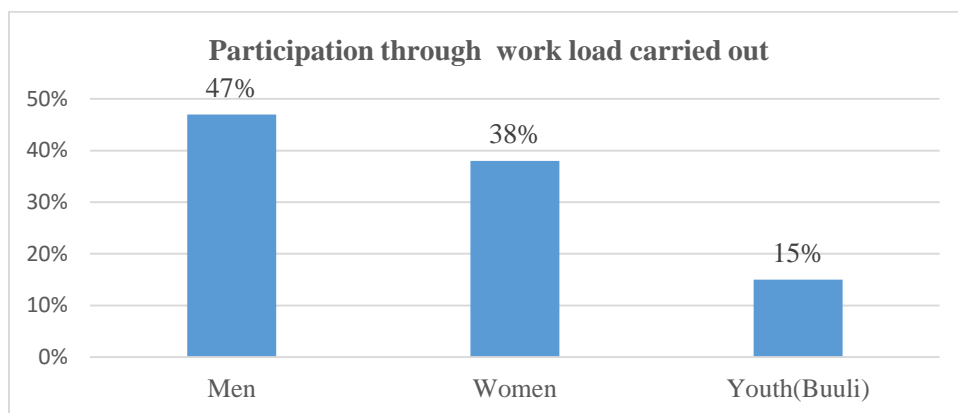
The findings showed that educational level is not a very strong influencing factor but most of the respondents interviewed had at least tried to study up to secondary level as indicated in the table 1 above.



In Picture: session in Focus Group Discussion with bee keepers.

47% of the work load in the bee farming is carried out by the men, 38% by women and 15% by youth. Unlike in the past where the bee farming enterprise in Uganda was mainly owned and managed by men. Women failed to participate in beekeeping due to cultural taboos such as those prohibiting them from climbing trees, and hence exclusion from honey harvesting operations.

Figure 1: Gender Participation in the Bee keeping Adventure.



Source: Field data 2017

The findings from the study showed a high participation of women and men jointly. The bee keeping activity is a Gender inclusive endeavor and promotes economic empowerment of women as summarized in the table2 below.

Table 2: Gender Participation in the Bee keeping Adventure.

<u>Key roles</u>		
<u>Men</u>	<ul style="list-style-type: none"> ○ Make the hives. ○ Look for the land where the sites will be located. ○ Buy the Hives. ○ Take honey to markets in other districts because the distance is long. ○ Harvesting of the Honey is mostly male dominated. ○ The men do the pest control which involves trapping birds, repairing hives, using catapults and greasing the trees. ○ Make water available for bees ○ Planning and advocating to government to invest in bee farming for communities ○ Creating linkages and mobilization of peers into bee keeping; especially the Village Saving and Loan Association groups to which the trainers belong ○ Lead in training peers as adopters and monitor progress of peers ○ Formation of loose Otuke Bee Keepers Association in 2014 ○ Provide security to hives 	47% of the total work
<u>Women</u>	<ul style="list-style-type: none"> ○ Primary processing and packing into clean containers. ○ Transporting from sites as men are harvesting. ○ They do all the local selling in the market. ○ They do the extraction of honey by squeezing into liquid honey. ○ They also harvest with the men by holding the light ○ They make candles out of the bee products ○ Make water available for bees ○ Planning and advocating to government to invest in bee farming for communities (eg. provision of technical back stopping, modern hives) 	38% of the work
<u>Youth('Buli')</u>	<ul style="list-style-type: none"> ○ Slashing around the Hive area so that the fires don't destroy the hives. ○ Hanging back the Hives when they are affected by wind or when not in good positions. ○ Daily checking on the process of colonization. ○ Harvesting with the Men 	15% of the work

Source: Field data 2017.

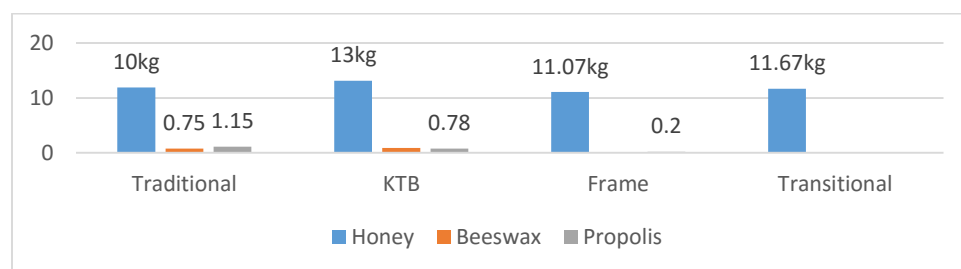
2.2: Analysis of the Benefits.

2.2.1 Economic Profitability of the Bee keepers in Otuke.

Crude honey is the major determinant bee product produced by all beekeepers and this is what the study team considered to analyze hive profitability at smallholder's level at a scale of 30 beehives and this is in line with the partial budgeting method used.

The study findings showed that Most of the respondents (62.8%) are harvesting once a year. This is also attributed to the fact that they are using local hives and using their traditional knowledge to do the bee farming. The 23.3% that harvest twice are those who have got some training and use more advanced traditional hives, some few (11.6%) harvest thrice and others more than thrice (2.3%). For most of the beneficiaries bee keeping money accounts for over 70% of the household income especially for the women. The output per hive type in terms of Kilograms(Kg) are as are as summarized in the chart below;

Figure 2: Annual average productivity of the different hive Types.



Source: Field data 2017.

The productivity/annual honey yields of traditional, transitional; KTB and frame hives are 10kg, 13kg, 11.07kg and 11.67kg respectively. The survey result indicated that KTB was yielding the maximum amount of honey and beeswax i.e., 13.11 kg and 0.78 kg respectively. No production of wax was reported from frame and transitional hives. 69.3% of the traditional type were colonized and 30.7% are not colonized. 23.9 % of the transitional type are colonized and 3.8% not colonized and KTB type, 82.7% colonized and just 3.8% not colonized.

Net Earnings per Hive per harvest.

Beehive type	Total production cost (Ugx)	Gross Return (Ugx)	Net income per beekeeper per year (Ugx)	Net income per hive (Ugx) per Harvest
Traditional	1,328,700	3,523,155	2,194,455	73,150
Transitional	1,684,450	4,470,690	2,786,240	92,868
KTB	1,491,420	4,988,955	3,497,535	116,600
Frame	2,817,710	6,355,290	3,537,580	117,857

Source: Survey 2017.

When compared to the type of hive and number of harvests per year; the highest percentage were using traditional hives (73.1%) of which they harvest only once in a year due to poor management practices and poor feeding of the bees.

The study also showed that 67% of the respondents had an average of 4 hives. So this means that their annual income is about $(4 \times 73,150 \text{ Ugx} \times 1 \text{ harvest season}) = \underline{292,600 \text{ Shillings}}$. It is worth noting that a Hive well managed with good bee care practices is able to give honey at least every (3 months and 2 weeks) implying that the earning from the honey could triple for all these bee farmers using the traditional hives.

The earnings show that there is great need to help the bee keepers commercialize the business of bee keeping since the number of Hives they are managing is still low hence limited income though all are very happy with their honey as observed in the one on one interviews at household.

Apiary management is the set of routine activities in an apiary depending on weather or seasonal changes and the initial objectives of set up. It is important for a beekeeper to know and use Good Agricultural Practices (GAPs) in his/her apiary for maximum yields and quality products.

However, there were some few farmers (7.4%) of the total respondents visited who had advanced and were harvesting larger volumes of honey in return. Those who bought KTB were inspired by the training from CARE and support given which positioned them into a place of earning lucrative harvests even using the local hives.

2.1.1.1. Case example of a success story.

We got a very interesting story from the husband of one of the women who was trained by CARE in 2011. He told us this story and accepted it to be used in this report as a most significant change story.

The story was narrated by the Patrick the Husband of Akello Florence from Olilim, Aluya Sub County, Agetta parish on November /11th / 2017 as interviewed by Oyuru Harry James..

She was trained by the CARE Project team under the groups as a model farmer, after the training, they started off with 4 hives of the local type. They have five (5) children and with the scarce financial support they had opted to have some stay at home. So as they started this business it proved lucrative as they could harvest about 23 Kgs of pure honey from each local hives at the end of the year. They used the knowledge of feeding bees in the dry season with cassava flour and sugar. Their honey was very clean even if they used transitional hives which earned them 9,000 Ugx per KG in the unprocessed state. They pack all the honey and take to Lira where they are sold with the combs. So with this harvest from the 4 local hives, they decided to buy 4 more hives of the KTB type and they harvest 3 times in a year (after 3 months and 2 weeks). Right now they earn between 600,000 Ugx - 700,000 Ugx per season. The money has helped them greatly with educating their 5 children (one is at Maker ere University), another joined tertiary institution for Technical studies in 2017 and the other three (3) are in secondary and primary respectively. For them the bee keeping is purely for school fees. They have a vision of increasing their hives to 20 hives by the end of this year.

2.1.1.2. Costs and Gross Margins across the Value Chain.

Producers	→	Bulkers	→	Whole salers	→	Retailers
Average selling prices (UGX/Kg). Raw Honey = 5,000 Semi-Processed = 6,500 Processed = 10,000		Selling prices (UGX/Kg). Raw Honey =9,000 Semi-Processed = 12,000		Selling prices (UGX/Kg). Semi-Processed = 12,000 Processed = 16,000		Selling prices (UGX/Kg). Raw Honey = 20,000 Processed = 20,000
Average Cost of producing Honey (UGX/Kg). Raw Honey = 2,953 Semi-Processed = 3,220 Processed = 4,429		Buying Price (UGX/Kg). Raw Honey =6,000 Semi-Processed = 8,000		Buying Price (UGX/Kg). Semi-Processed = 7,000 Processed = 9,000		Buying Price (UGX/Kg). Raw Honey = 10,000 Processed = 12,000
<u>Gross Margin (UGX/Kg)</u> Raw Honey = 2,047 Semi-Processed = 3,280 Processed = 5,571		<u>Gross Margin (UGX/Kg)</u> Raw Honey =3,000 Semi-Processed = 4,000		<u>Gross Margin (UGX/Kg)</u> Semi-Processed = 5,000 Processed = 6,000		<u>Gross Margin (UGX/Kg)</u> Raw Honey = 10,000 Processed = 8,000

Source: Field survey Data 2017.

The result of the findings suggests that improving farmer's access to up-to-date market information and assisting them in identifying the location of promising markets and effective demands would help them as an incentive to increase productivity and quality of their product which could further help them to increase their market linkage to processors concentrated mainly in the major terminal market bigger towns like Lira, Kampala and regional markets.

2.2.2. Impact of bee keeping on environmental conservation.

Biodiversity.

Biodiversity is measured as the number of different plant and animal species found in a certain unit area. Without bees there would be no flowering plants, and without flowering plants there would be no bees. Without bees biodiversity would not be so great. To measure the improvement in the environmental condition or impact of the intervention we compared the differences between the current ecological condition and the status by baseline data. The measure of arboreal and non-arboreal species was done through visual observation and use of the ecological evaluation checklist. The findings showed the following;

Flora and Fauna.

The vegetation is mainly tropical savannah woodland comprising of grassland, secondary forest of indigenous tree species and scattered thickets were observed to be emerging. This is interrupted by wetlands plants in the lowland and farmlands.

The flat areas comprised of mainly woody species and a few non-woody species in the lowlands. The keystone species identified were; shea butter tree, *Ficus mucoso* (Annar/ Ananga), *Acacia Senegal* (Achika/ Okuto), *Hyparrhenia filipendula* (Ogali), Ayekayek/ Itek, *Vitex doniana* (Owelo/ Owelo.) among others.

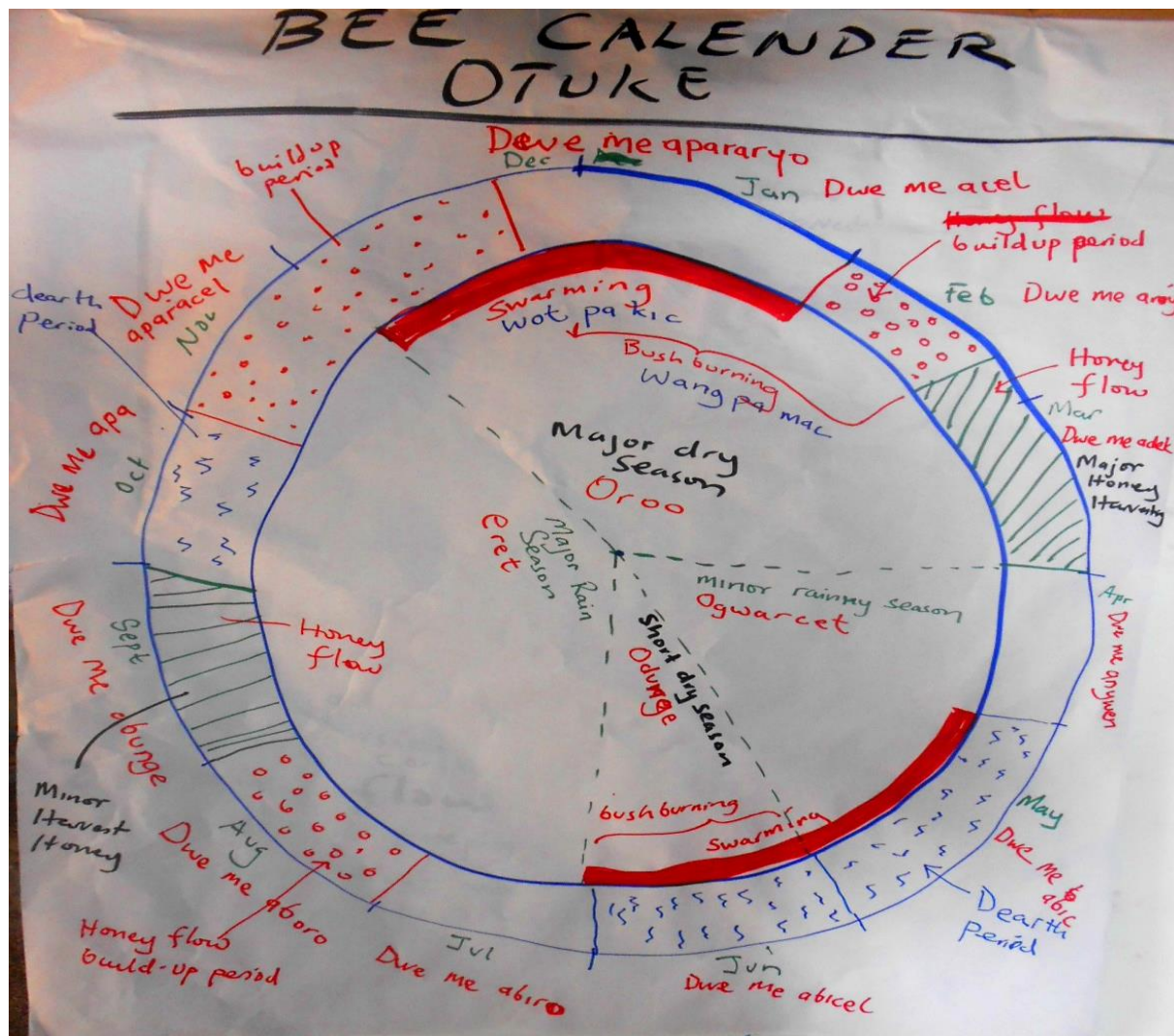
Wetland plants species were also observed in the low-lying and waterlogged areas. The prominent grassland species identified included; *Hyparrhenia filipendula*, *Echinochloa pyramidalis*, *Nandi setaria*, *Setaria pumila*. Wetland species observed were; *Cyperus dives*, *Typha domingensis*, *Typha capensis*, *Lossiah cuspidata*, and water lily.



The dominant tree species in Olilim and Ogor Sub county were; *Vitellaria paradoxa* (shea butter tree), *Combretum* species, *Terminalia* species, *Ficus sur*, *Ficus mucoso*, *Ficus platyphylla*, *Acacia*

drepanolobium, *Acacia senegal* and others seen were *mangifera indica*, *Vitex doniana*, *Albizia*. Species seen planted in woodlot were mainly; teak, pines, gravella, and eucalyptus.

The bees' behavior is very sensitive to their environment. When there is plenty of food, bees make honey to eat later on when there is little food. The beekeeper shares in this stock of food. Manipulating the colony to be at the peak strength at the right time is fundamental to good beekeeping. Good flying conditions (dry weather) for the bees are also important during the nectar flow to get maximum yields. Therefore, all management practices are related to the bee colony cycle and understanding which stage the colony is in. This can be seen by the following mapping that was done in this community.



Calendar mapped out by the Farmers during the Initial Training by CARE in 2013.

In Areas where hives are hanged comprised of mainly indigenous woodlots and grasses. Trees are habitat to vast number of species like insects, avifauna, creeping plants, soil microbes forming a completely unique ecosystem. The dominant tree species in both Sub Counties is the threatened

Vitellaria paradoxa (shea butter tree), and is followed, Combetrum species, Terminalia species, Ficus species. This is equally practiced in both Sub Counties.

Bee farmers conserve indigenous tree species because indigenous trees produce the best flowers which results into high quality honey. Shea butter tree in particular is said to produce the best flower for honey production.

Bee hives were installed on and under Indigenous tree species because they provide the best shade for the bees and good branches to install hives. Alien species like pines, eucalyptus rather grow straight with limited shade and branches.

Natural water sources in close proximity to the hives are protected to ensure availability of water to bees. This has led to the protection of the unique aquatic ecosystems. Although this is a working progress and the water sources are far (1km to 2km), farmers appreciate the importance of these water sources. In Ogor Sub County, most of the hives visited were in lowlands.

2.2.3. Spillover effect of the trainings to the community.

The trained trainer's bee sites are community peer to peer learning sites. The impact was very great and most of these lead trainers had very many people under their supervision. This was evident both across groups managed by men and those of females who had been trained as well.



(Pictures in Olilim site) taken from one of the beneficiaries of a trainer who was trained by CARE. This beneficiary now also supervises other 5 youth friends who stay near him. Their site is a demonstration site where they share knowledge. This the impact of the training.

Case story: How the training sparked off the genius of indigenous knowledge.

This story was captured as told by one of the beneficiaries of the training by the name of Acuma

Tom, 56 years old and father of 8 biological children and based in the parish of Gotojwang, Olilim Sub County. The story was captured on 12th Dec 2017 James Oyuru during the interaction with CARE trained beneficiaries in a validation work of the study on honey value chain intake district under the Partners for Resilience Strategic Partnership project.

He was trained in 2012 and 2013 and now manages 30 transitional hives that he has made with his own hands after the knowledge he acquired from CARE.

His story was of interest because of the way he has used the knowledge acquired from the in bee farming.

He even has secured another local market within Uganda that is ready to buy all the honey produced but at 8000 Ugx per Kg of processed honey.

Tom joined the CARE training after he was tipped by friends that there was an opportunity for training bee farmers in the Sub County. He was not among the 30 selected beneficiaries but managed to go a milestone by contacting the LC 3 Chairman of his village who linked him to the sub county team and he was accepted for the training by CARE team.

He acquired the knowledge and went back to try his luck in the business. Using his knowledge of Hive making he tested by constructing the transitional hives using local trees and cow dung .He made 5 and within a week they had colonized though because of the smell the bees left after 3 days and this was observed in all the hives made using cow dung.

So he improvised, begged a saw machine and using there indigenous knowledge of good local trees for timber, he cut a tree called 'Tek Lek' picture below and made 30 hives which he has up-to-date.



Photos : On the Left is Mr. Acuma Tom standing next to his hives at his garden site near his home and on the right are samples of IEKIEK Tree found at his place where he is now planning to make more 100 hives

His harvests have risen over the years (2014 he harvested 50kgs, 2015 75 kgs, 2016, he got 75 kgs and 2017, 77 Kgs). He has always sold this in the local market in otuke at 8,000 Ugx which fetches him 600,000 Ugx additional income per season. His story become more interesting when in 2017, Tom decided to venture into business beyond his district of Otuke. He carried the honey to Kampala hoping for better prices but just to be told that they only take processed liquid honey instead of the combed honey, so stuck with his 77kgs in Kampala Tom decided to extract the Liquid honey using traditional method of squeezing through a clean piece of cloth and bucket. He extracted 45 Kgs and sold off to Super

markets at 10,000 Ugx per Kg. During this saga one retail buyer at the super market from Netherlands came across honey from Otuke and after discussions about the honey with Tom, he decided to take a Kg for testing in the Netherlands and after two weeks called Tom, saying the Honey was first grade and needed seriously in Netherlands. So he asked Tom to supply 15,000 Kgs of processed liquid Honey at 12,000 Ugx per Kg.

Current challenge the Group is facing in meeting the supply demand of the new Market.

Due to the overwhelming demand, Tom decided to recruit 250 village mates (most of whom are members of the PfR project Village Saving and Loan Association members and model farmers), He got an abandoned community school and started training them freely so that they join the business. He has now successfully raised a team of 75 farmers. He has not stopped at that, he is also now making transitional Hives that he will sell at 50,000 Ugx each instead of 120,000 Ugx as is the local price of these Hives.

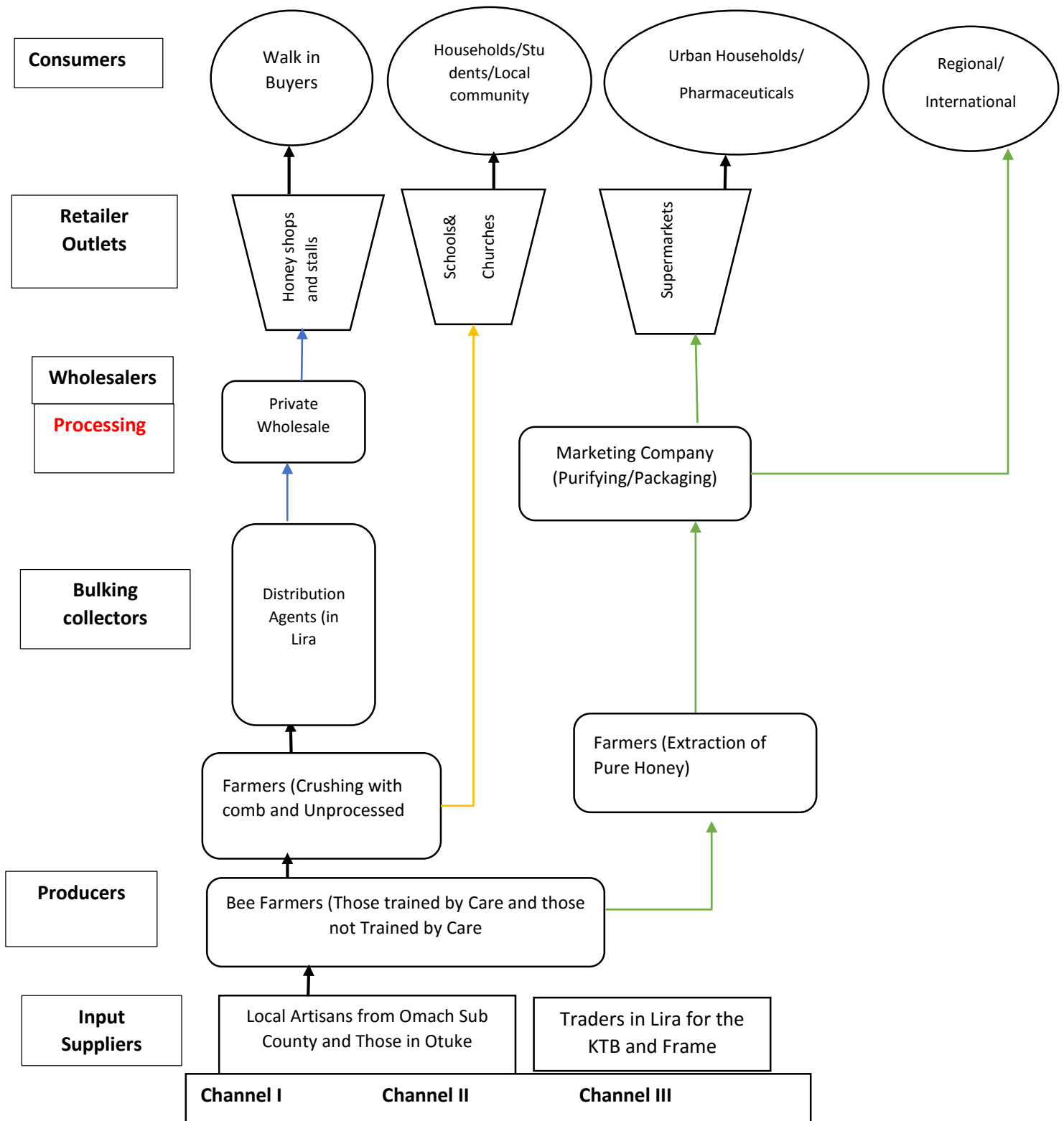
But with this new demand from the international Market and even regional market, Tom needs more technical support and so he approached CARE to help further this endeavor. By the time of this story CARE had organized with the District Entomologist to standardize the training curriculum with that of Ministry of Agriculture and also The training center for Apiary management in the District will be at Toms village. There is great need to support this farmers to increase production and quality trainings to meet this market niche.

Tom has improved his farm by planting fruits and rain harvesting pond so that the bee farming is furthered. Below are pictures from Tom's Garden site.



Pictures: On the right is Tom's Garden full of fruit trees good food for the bees and on the right is a water source that is used to make sure bees get enough water and even to locally irrigate vegetables.

2.3. Value chain mapping and channel analysis.



Legend: → Different forms in which the honey product is sold and Distributed.

2.3.1. Functions, Actors, Channels and Products Flows

2.3.1.1. Number of Actors.

The main actors in the honey value chain in Otuke are: input suppliers as the first line major actors, Producers (bee keepers) who are the second line main actors and also double as semi processors, the Whole sellers (bulkiers) are the third main actors in the chain and they are taking the role of the processors & transporters. Retailers are mainly stall shop owners and supermarkets, and consumers at the upper end.

2.3.1.2. Functions of the Actors.

A).Input Suppliers.

At the bottom of the chain are the input suppliers. The major inputs required for honey production are the bee colonies, beehives, beeswax and accessories such as queen excluder, smoker, veil, honey extractor, honey jar, overall and gloves. Smallholder beekeepers are the main sources of bee colony and traditional hives. Hives suppliers are mainly in Omach a sub county in Lira and the other inputs are bought from private input suppliers in Lira district. There are no specialized bee input shops within the district itself.

There are also local beehive artisans who can make the traditional hives from tree logs. The local artisans are located in the Ogor Sub county but have a challenge of access to materials for making the products. The artisans in Omach are privileged because they access the materials and make hives that they are supplying the whole Lango region.

B).Production.

The majority of the producers/beekeepers are mostly smallholder villagers managing their hives and harvesting honeycomb for domestic consumption or sale to the local market (usually within the village). The FGD participants believe that smallholder beekeeping will continue to grow and engage more beekeepers. It is also expected that private traders and Peri-Urban dwellers will be joining the supply chain at the stage that fits their socio-economic context as the urban beekeeping grows.

Semi processing is done using Pressing method using a cloth. This is a traditional method of extracting honey from the honeycombs by hand pressing the honeycombs in a clean cloth and honey oozes out of the cloth into a storage bucket. Sometimes honey crystallizes while in the honeycomb and this makes it difficult to extract.

There is great opportunity of increasing benefits to the farmer's productivity by helping and training them into modern processing techniques and also linking them with other experienced modern farmers so that they can improve on the quality of the produce.

C).Whole Sellers (Bulkiers)

Wholesalers buy directly from the producers (bee farmers). The bee producers are involved in semi processing; removing any particles that are caught during harvesting, crushing the comb and the honey into one product and packing into airtight buckets that are used to transport to the whole sellers in Lira.

Most of them are commercial processors who undertake standardized processing, labelling and packaging, there are others who double as retail traders and producers who only do extraction of liquid honey from the honey combs.

D).Retailers.

The main retailers are located in Urban and per-urban centers. Some retailing is also done by the women in the daily and weekly markets, churches, and every day from homes. They locally measure raw honey using small spoons that goes for 500 Ugx and big spoons for 1000 Ugx. They sell a Kilogram of raw crushed honey at 3,500 Ugx within the local markets.

E).Consumers.

For Otuke honey products, 75% was found to be consumed within the district. The main final buyers were the households, school children, CARE staff and local community. Honey is used in households as a preferred sweetener and it is also consumed in its raw state (honey combs) mostly, used in first aid treatment especially for wounds, burns and cuts and honey is mixed with lemon for sore throats and it has also been used for stomach pains.

2.3.2. Flow of honey products.

Raw honey flows through three different channels (refer to the Map- I, II, and III).

The first channel, takes up to 15% of the raw honey and it links producers directly to retailers. In this case, producers pack the raw honey in airtight buckets and distribute to retailers for selling to consumers who prefer the raw honey. The main end market is normally retail outlets in Lira and along high ways like Kamdini. This market earns the bee farmer about 9,000 Ugx after semi processing but there is a challenge with producing enough volumes since only very few farmers(about 7%) produce good quality honey.

Through Channel II, Producer-processors are the beekeepers who engage themselves in small-scale processing and packaging. They sell directly in the local markets around Otuke. The main distribution centers are School, Churches and local weekly markets .The main consumers are the local community. This Channel absorbs 85% of the honey produced by Otuke farmers the remaining about 10% is less profitable and is characterized by low volume and poor quality honey harvested just locally. But the reality is that there is very high demand for honey locally as food.

Through Channel III, 10% of honey is sold as combed and semi-processed to both processors and producer processors. These main actors are the independent large scale farmers (30 – 50) hives as per the village standards. They process and sell in larger scales that is packed and sold to the Regional Markets as well

3.4: System-wide constraints identified in the Value Chain.

Type of Constraints	Observations.
1. Inputs and farm production level constraints.	<ul style="list-style-type: none"> • There is low access to improved hives hence low harvests. • They are not linked to Suppliers of modern hives. • The Women can't make the hives even if they have the skills. They noted that the Local trees are so hard for them do make the hives. • They also access the local hives from a very far distance and many need initial financial support even if they really want the hives to boost production. • They need harvesting gears. The 15 pairs given to the first pilot team by CARE is shared by over 5 people per accessible trainee. This is a major constraint on the quality and production quantities and delays work. • Lack of forage and food for the bees. There is need for technical support to these farmers to improve productivity.
2.Organization and Management	<ul style="list-style-type: none"> • After the first phase of PfR project, everyone is surviving on their own. They really struggle to access information and support from each other in a timely manner.e.g most people where suffering with pests but when we called them in the FGDs, they got solutions easily from their friends in the groups. • The trainees in Olilim formed a loose Otuke Bee Keepers Association and it is registered at Sub County and district level but needs to be trained in group dynamics, record keeping, among others. • District lacked an entomologist until December 2017 when one was recruited after advocacy by CARE and community members on need to boost bee farming as food and measure for ecosystem management and restoration. • As the area is still sparsely populated, the available bee keepers are far apart. Pooling them from different sub counties together requires resources which the second phase of PfR SP does not provide.
3.Product Marketing, Distribution, and Sales	<ul style="list-style-type: none"> • The marketing is at a very local level and most honey is eaten locally implying low income. • The farmers just do spot selling in Lira to middle men and this makes them not to have bargaining power.

	<ul style="list-style-type: none"> • They only explore channel I and II as indicated in the value chain map and these are the lowest paying chains for them. • Emerging lucrative markets may further exploit bee keepers who at the moment lack legal institutional arrangement with concrete terms of joint trade or business and whom are largely illiterate to negotiate prices.
4.Awareness and Knowledge	<ul style="list-style-type: none"> • The first phase of the program focused on awareness strategy for the producers but there is need to engage the policy leaders too for scaling up the innovation, regulate the bee business and link to market opportunities. • The Bee farmers are not aware of the standards required from other markets outside their traditional trade locally?

4. Current Threats to the Bee Keeping in this Community.

1. Wetland Reclamation/ Encroachment.

This is the leading environmental vice in Olilim and Ogor Sub Counties and the district at large. Wetlands are encroached mainly for farming activities with rice growing as the leading crop, establishment of fish ponds and growing of vegetables. This further increases the community vulnerability to climate change effect of flooding. This is more pronounced in Olilim than Ogor Sub Counties. Most of the large scale bee keeping farmers are located near wetlands due to access to water and natural forage in the area and these wetlands act as the main source of bee forage and water.

2. Deforestation.

Tree cutting is still being practiced in the two project Sub-Counties of Olilim, Ogor and others. This is mainly for charcoal burning, wood fuel for domestic use and institutions and farm clearing. The situation is exacerbated by ever increasing demand for charcoal and wood fuel. This vice is equally practiced in the all the Sub-Counties of the district. Though the district with the help of care are working on developing a community monitoring plan. This act makes the farmers fear to invest much in the bee keeping since the charcoal burners don't care about the hives in the areas.

3. Uncontrolled Bush Burning.

This is done mainly in dry season although some cases during wet seasons are registered especially at the onset of wet season. Bush is burnt for clearance of vegetation especially in wetlands, hunting and regeneration of pasture. The effect of this, is that the soil is deprived on organic matter that would in turn be decomposed to release nutrients hence improvement in soil fertility, exposing soils to further degradation, washing away soil nutrients and scaring away bees.

5. Conclusions and Optimal Recommendations.

A).Conclusions.

The findings from pilot phase shows that bee keeping has a very great spiral effect on the way the environment is managed and even the livelihood of the people. The core strength area is that there is high community participation which is a promising pillar for the scaling up of the Pilot and also the returns in financial terms are good.

Addressing the issues of the casual factors will greatly impact the human behavior in this community. The strategy should focus on:

1. Addressing the constraints across the value chain of bee keeping in the community which in turn help in increasing incomes and even environmental challenges.
2. Supporting the community to adhere to the laws and policies in place both at International, National and District levels which promote integration of risk management measures in all development work. This will be done through different advocacy and lobbying forums as indicated in the matrix below.
3. Empowering the community at household level by building their capacity, disseminating knowledge and encouraging best practices that improve their farming methods.
4. Building on the existent social capital (which directly relates to PFR SP principle 1 –thus putting community at center of development work) of strong community desire to do bee keeping as a source of food and also given the history of the community where bee keeping was a traditional activity in the past mainly because of its medicinal uses and social ties.

Disaster Risk Reduction is “the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events”. (UNISDR, 2009; CARE, 2017).

B).Recommendations.

A).community level.

Since productivity and quality are weak, these small producers are unable to meet requirements of higher value markets. Buyers in future will definitely become frustrated because suppliers are unable to meet demand, and as a result they will shift their focus to other sources. This in turn means that income opportunities are lost for small producers, resulting in insufficient investment in productive technologies and better working conditions.

We need to support the value chain by helping the farmers overcome some of the constraints identified at the different levels i.e. Input access, production, Marketing. The following areas provide opportunities for strengthening the whole honey supply chain:

- VI. *We need to support the local artisans who are already in the community and part of the group. There major constraints are in access to materials for making the hives and yet*

there is high demand for improved hives in the community and many travel long distances to buy these hives. So setting up a group that will get Technical support from the district entomologist to ensure that the hives are designed in good technical specifications will be of great help to these farmers.

- VII. *There is opportunity for supporting the women to operate the business of trade in supply of harvesting gears and other harvesting equipments. The women can do this if given soft financial support through the VSLAs. They can have a centre where farmers place their orders and they deliver.*
- VIII. *The groups need support to increase on the volumes at individual household level. This can be done by working with the group leaders to make sure that each bee farmer has at least 30 hives for a start. This will greatly improve on the income of each bee farmer since we have already seen that there are those managing over 50 hives and are doing very well. This will also create a great linkage between the artisans producing the hives under the Project support and the farmers providing the market but will also be a base for making the farmers attract bulk buyers at the district.*
- IX. *There is great need to scale up the training that was done at the beginning of the project since more farmers have joined. This can be done using a contract farming model where we engage some bulk buyers to support this farmers with training but also provide a forward market for the produce. This model will make care and its partners as value chain facilitators to stabilize the marketing chain while mentoring the groups to supply the international markets which they have already accessed.*
- X. *There is need for guiding the farmers on developing their forage and feeding bees so that better quality honey is got. This also provides opportunity for promoting agro forestry and Afforestation. Each family will be encouraged to plant trees around their gardens and the project can work with the district programmes to enable access to seedlings or make other members take up the business of seedling production.*

B: district level.

- I. *There is the opportunity to work hand in hand with the district production office to support the development of proposals for developing bee keeping as a district income initiative. This will attract all government programmes of research support carried out through NARO and also provision of inputs through the Operation wealth creation initiatives. This will also enable the groups to access full technical support at from the department of Entomology.*
- II. *The district is working very hard to stop Deforestation and this provides an opportunity to use the scaling up of Apiary by developing procedure management policies for Apiary farming in the district forest Land as provided for in the national policies that is managed by the district Natural resource department. This will enable the better use of these areas while the community become the monitors of what is happening at the village levels.*
- III. *The establishment of bee products cooperatives, or any other form, as operating structuring and framework for the commercial beekeepers associations has to provide the*

practical route forward. There is nothing in place now at the district level yet Honey from Otuke is very good and marketable.

C: opportunities at national level.

- I. Huge natural capacity still remains for the development of commercially viable bee product enterprise in Uganda. The wide and rich botanical resources give rise to unique and attractive fragrance specialty honey. This has already caused great interest of certain international buyers. Government has recently put in its agenda the need to develop apiculture reserve areas in and around forest areas and this helps to reduce poverty and to diversify national exports.
- II. The quality parameters of local honey in Uganda are good and within acceptable limits of the National Honey Standards. These findings indicate that Uganda is endowed with diverse, unique and pollutant free honey with great scope for diversification of products. Moreover, each agro-ecological zone displays a distinct floral, ecological and socio-cultural identity, which offer excellent opportunities for branding the national honey (NARO, 2017).
- III. Implementation of environmental laws, regulations and policies as measures for integrating risk management in policy. This is being done by the district natural resource department (DNRO, FO, Forest guards) with facilitation from development partners like CARE, IUCN, Facilitation for Peace and Development, Bee keepers association, CBOs, Rwot Kweri (traditional leaders) among others. The laws, regulations and policies being implemented includes;(a)NEMA Act 1995,(b)National Forest and Tree Planting Act 2013,(c)Wetland policy 2003,(d) NFA regulation 2003,(e)District Natural Resources Bill,(f) Community bye-law that protects shea nut trees,(g) Rejuvenation of traditional values and norms on some special and indigenous trees.
- IV. In May 2005, the EU Commission approved Uganda's application to be listed among the Third countries allowed to export honey to the EU under legislation EU Council Directive 96/23/EC.

The above steps are accompanied by dissemination of some related national policies like the: *National Disaster Preparedness and Management policy (2010), National Climate Change Policy (2014), National Development Plan 11, National Climate Smart Agriculture framework and Apiculture policy and international frameworks including Sustainable Development Goal 15 (protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse degradation, and halt biodiversity loss; and SDG 1 &2: End poverty in all its forms everywhere, End hunger, achieve food security and improved nutrition, and promote sustainable agriculture).*

6. Strategic interventions matrix based on the challenges, constraints and opportunities identified during the study.

INTERVENTION AREA	STRATEGY	DESCRIPTION	KEY PARTNERS	TARGETTED CONSTRAINTS.
1. Advocacy and Lobbying. <u>Key Policy Areas:</u> NEMA Act 1995 Wetland policy 1995 and NFA regulation 2003	Engage the authorities and Community to come up with more robust wetland management plans.	Wetland management plan explores wetlands management from bottom-up approach and the community are solely responsible for regulation and conservation of their finite resource. This wetland management plan can be established at village, parish and sub county level depending on the need to be addressed.	District leadership/ council, Community, Government Line Ministries (MWE).	i. Issue of unplanned for Bush fires. ii. Unguided use of the wetlands for farming. iii. Continued destruction of Forests.
2. Advocacy and Lobbying. National Forest and Tree Planting Act 2013	Facilitate the Process of Developing a bee keeping procedure on the district Local Government land in Otuke	This Standard Operating Procedure relates to the conduct of apiculture (beekeeping) on all LG land (forests, parks and reserves) managed by the Department of Environment and Natural resources in the District.	The Individual bee keepers. District Local authorities. Associations guiding Apiculture development in the District and Partners like ZARDI that facilitate research and	i. Fear of investing into Apiary since the community does not own the land. ii. Increased community conflict due to wild honey hunters who intrude on hive sites and steal Honey. iii. Lack of support to the bee farmers from the Local District.

3. Building Resilience to disaster Key Policy: National Forest and Tree Planting Act 2003	Engage the households in the project group to practice Agroforestry and Afforestation. Fruit tree planting and selected trees good for bee forage should be prioritized	Low income and ignorance are the main issues targeted here. The role of honey bees within an ecosystem is the primary consideration. The relationship between bees and people has become central to this understanding. Bees need a clean, flower-rich and diverse landscape. They require sources of nectar and pollen, propolis (plant resins) and water. Diverse and nutritious forage is vital.	Other partners like NEMA, IUCN, Kidepo Critical Land scape programme, Uganda Wild Life Authority, District Environmental officers, OWC program,	<ul style="list-style-type: none"> i. High population pressure on the wetlands. ii. Low yields due to poor soil management. iii. Low Honey production per colony and high swarming. iv. High impact of natural hazards like flooding and Hailstorms.
4. Upgrading the value chain.	Improve Quality and quantity of Honey production for higher incomes. Capacity building, Linkage to input suppliers and group organization is critical here	The frequency and amount of honey harvested varies depending on flowering condition of major bee forage, colony management practices and number of beehives. The international markets for all high value and value added bee products demand proof of sustainable production. Maintained under the certification.	Input suppliers of Hives, Bee keeping Associations, Big wholesalers, Regulators Other BDS service providers will be key partners.	<ul style="list-style-type: none"> i. Technology adoption especially that of improved beehive technology is very low. ii. Value addition is at low level because of lack of processing equipment.

7: Annex:

7.1. List of major actors in the apiculture sector in Uganda.

Core market (Micro level) actors G1: Processors and packers in Uganda		
Name	Products/Services	Contact address
Aryodi Bee Farm. Lira.	<ul style="list-style-type: none"> • Honey, beeswax, propolis, honey wine • Consultancy services in beekeeping & apiary management • Queen bee rearing • Training and resource centre • Beekeeping inputs supply 	Tel: 0752-843446 E: aryodibeeefarm@yahoo.com
Bee Natural Uganda Ltd	<ul style="list-style-type: none"> • Honey, beeswax, • Beeswax foundation/ sheets and candles 	Tel: 0772-209000 E: maria@beenaturalproducts.com Web: beenaturalproducts.com
Blessed Bee for Life Trade Post	<ul style="list-style-type: none"> • Honey, beeswax, beeswax ointment, propolis • Inputs supply & installation • Beekeeping trainings & consultancy 	Tel: 0782-541912 E: blessedb4life@gmail.com
Gate's Honey	Honey, beeswax	Tel: 0703-116380 E: gateshoney@gmail.com
Golden Bees Ltd	<ul style="list-style-type: none"> • Honey, beeswax and propolis • Inputs supply & installation • Beekeeping trainings & consultancy 	Tel: 0752-484225 E: mubrynt@yahoo.com
Core market (Micro level) actors G2: Service/input providers in Uganda		
Name	Services/Products	Contact address
Chemiphar Laboratories Ltd	Laboratory services for testing & quality assurance of honey & other bees products	Tel: 0414-268832E: chemiphar.uganda@chemiphar.com

Natural Enterprise Development (NED) Ltd	<ul style="list-style-type: none"> • Business development services • Investment planning and management • Product development 	Tel: 0312-114006 E: info@naturalenterprises.net
The Beekeeping and Exhibition Centre (The BEE Centre)	<ul style="list-style-type: none"> • Research & training • Provision of market & investment information • Training in product development 	Tel: 0772-590 482 E: kajobe@forestmak.ac.ug
Regulatory & business enabling environment (Macro level) actors: Key Government agencies supporting apiculture in Uganda		
Name	Type of organization & services offered	Contact address
Ministry of Agriculture and Animal Industry & Fisheries (MAAIF)	Government department responsible for policy development, regulation & information dissemination for apiculture	Tel: 0712-273059 E: akangave@utlonline.co.ug
Uganda Export Promotion Board (UEPB)	Export development, including market research, trade promotion and export documentation	Tel: 0414-230250/230233 E: ceo@ugandaexportsonline.com www.ugandaexportsonline.com
National Agricultural Advisory Services (NAADs)	Facilitates the provision of extension services to farmers	Tel: 0414-345440 E: info@naads.or.ug Web: www.naads.or.ug
Uganda Investment Authority (UIA)	Public agency that promotes and facilitate private sector investment in Uganda	Tel: 0414-301000 E: info@ugandainvest.com Web: www.ugandainvest.com
Uganda Bureau of Statistics (UBOS)	Public agency responsible for statistics generation, analysis and dissemination	Tel: 414 -706000 E: ubos@ubos.org Web: www.ubos.org
Uganda National Bureau of Standards (UNBS)	Statutory organization which develops national standards and monitors quality assurance	Tel: 0414- 505995 E: unbs@infocom.co.ug Web: www.unbs.go.ug

National Livestock Resources Research Institute (NALIRI)	Research organization that spearheads apiculture research	Tel: 0772-590 482 E: liridir@hotmail.com /
Competitiveness and Investment Climate Strategy Secretariat (CICS)	Apiculture sector cluster support	Tel: +256-41-349806 E: cics@finance.go.ug Web: www.cics.go.ug
Uganda Industrial Research Institute	Apiculture business idea incubation and research	Tel: +256-414-286 124 E: mail@uiri.org Web: www.uiri.org
Department of Food Science and Technology (MUK)	Research and product formulation	Tel: +256 414 533676 E: foodtech@agric.mak.ac.ug Web: http://agric.mak.ac.ug
Faculty of Forestry and Nature Conservation (MUK)	Research and training in beekeeping / biodiversity	Tel: +256-414-591751 E: twinomukunzi@forest.mak.ac.ug Web: forestry.mak.ac.ug
Department of Botany (MUK)	Training and research related to bees and botany	Tel: +256 414 532401 E: dean@sci.mak.ac.ug Web: www.botany.mak.ac.ug
Support services (Messo level) actors1: Umbrella organizations supporting apiculture in Uganda		
Name	Type of organization & services offered	Contact address
ApiTrade Africa Co. Ltd	Regional membership organization, which promotes trade in African bee products	Tel: 0414 667845 E: info@apitradeafrica.org Web: www.apitradeafrica.org
The Uganda National Apiculture Development Organization (TUNADO)	Membership organization that coordinates the apiculture sector in Uganda.	Tel: 0414-343160 / 0712-417452 E: tunadobee@yahoo.co.uk

Source: ApiTrade Africa, and this survey 2017.

7.2. Contacts of bee keepers in Otuke.

OGDA SUB COUNTY. 12th NOV - 2017.			
Attendance List.			(village name)
SNo	Names	Contact	Address.
1	OMYEKO GODFREY	0705538584	ALAPATA
2	OKOL GEFREY	0706340620	ALAPATA
3	ACIRO HARRIET	0754883271	BAR-OKANGO
4	ADERO BORIS	0785516193	ALAPATA
5	Okua David	0756341886	Okua
6	ALUK EMMAWALEH	-	ALAPATA
7	OPENA JOSEPH	0752857631	ALAPATA
8	KUTANCIA MONGI	-	ALAPATA
9	AMULE AMULETA	-	ALAPATA
10	Anyang ROSE	0754023448	ODEDO
11	Luto ADONO	-	TEBOKE
12	ANANG SILVIA	-	BAROKANO
13	OKELLO MOSES	-	Alapa
14	OPIO ISMAIL	0773882848	OGWENGO
5	OBUA JAZHER	0753474986	AKUDAWALIA
6	OMARA SAM	072004946	ACERMENT
7	ABUR JENNET	0784572438	OKET, OKURO, OGOR
	OKORI MARY	0706383329	AMARO DEL
	KELLE ANNIESS ACIRO	0754565414	AMAROKOT
	GRACE Omyelwo	0750475439	Awel, Okuro - OGOR
	OTON ISMAEL BOB	0759189040	Awel, Okuro - Okor.
	TINO BEATRICE	0754235887	Alkudei wellei
	OKHENG ROBINSON	0783648472	ALAPATA
	OCEH ALEX	0771/0791-838640	ALAPATA
	Oyame Jimmy	0778856576/073329315	BAR-OKANGO.
	OKOLA GEORGEY	0784389067	Alapata.
	Aello Sarah	0778299009	OCIRO
		0704390350/078589325	Aweli
			Alapata

11th/10/2017

ATTENDANCE LIST. (FGD)			
No	NAMES	CONTACT	ADDRESS
	AMIO DICKENS	0781132671	OLWOKO LCI
	OKWIR BOSCO	0789780209	OHAROKAGEDO LCI
	OMARA DICK	0788284861	OLWOKO LCI
	OPIO RAYMOND	077764857	OLWOKO LCI
5-	OGWIR DAVID	0788103498	CUMAC LCI
6-	OGWAL ALEX ONGOM	0772002184	AMYEDE LCI
7-	ACOB JAZZ	0785475987	OHAROKAGEDO
8-	OKELLO PATRICK	0777142967	ALUKOI
9-	ARWATA DENISH	0787706134	APA PEE
10-	ENEN DAVID	0781256341	ALUNYA
11-	OGWANY EBSON	0778127362	ALUNYA
12-	OJUKA BONNY	0783632405	BONNY

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