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THE GENDER GAPS IN CHALLENGES FACING FARMERS IN IMPROVED BEE KEEPING: CASE OF THE MAASAI COMMUNITY IN TRANS MARA, NAROK COUNTY, KENYA

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Abstract

Purpose: This study sought to explore challenges facing men and women in improved bee keeping among the *Maasai* community in Trans Mara, Narok County.

Methodology: A mixed method approach was used thus, it was both qualitative and quantitative in nature. Through stratified random sampling, 180 respondents were interviewed for household surveys, 16 key informants (KII), and 36 participants for focus groups discussions (FGDs). Structured and Semi-structured interviews were used to collect both qualitative and quantitative data based on research objectives.

Findings: The study found that most women who resided far from the demonstration plot were never trained due to gender related factors such as mobility, marital status, time, as well as socio-cultural perceptions. Women were mostly constrained by capital while men who control large herds of livestock had no problem with money. In marketing, women were more vulnerable in comparison to men due to challenges in mobility and time to move out and search for better markets. Improved bee keeping can employ the resource-poor who mainly comprise of women.

Unique contribution to theory, practice and policy: The study recommends that interventions with improved bee keeping should purpose to understand the specific challenges and cultural factors that constrain both genders in communities. To enhance access to trainings, there is need to construct demonstration trials within the localities for ease of access to both genders especially women. Forums should be enhanced to empower both genders on importance of joint sharing of productive assets

Keywords: *Improved Bee Keeping, Challenges, Men and Women, Trans Mara, Narok County, Kenya.*

1.0 INTRODUCTION

Over the last decade, improvement of bee keeping has broken gender barriers by incorporating women and the youth (Kugonza, 2009). However, involvement of women is still low since the challenges facing both genders are diverse. Most studies in the sector have recorded gender neutral constraints yet, improved bee keeping is favourable to both men and women. The enterprise can employ the resource-poor who mainly comprise of women. It is economical, needs less land and does not require excessive labour and time to manage, as bees do most work. These characteristics that are highly compatible with the needs and constraints of resource poor farmers, majority who are women (King, 2013).

It is therefore important to explore the unique challenges faced by both genders. The fact that they experience diverse challenges elucidate that solutions need to be gender responsive. It will not only assist government on policy, but also advise on how to employ gender responsive strategies. For example, according to KALRO (2017), youths' engagement in agriculture remains low despite the growing number of well-educated young persons who are taking up agriculture as a business. There is need to find ways to encourage their participation and a cognizance of needs of those already engaged, and how to address them. Several studies have been done on improved beekeeping but so far, none has explored the gender challenges especially among conservative communities.

A gender responsive technology will promote the socio-economic development not only in alleviating prevailing constraints, but also in enhancing productivity, quality, and market access. This will benefit bee farmers and enhance their income generation leading to poverty reduction aimed by Kenya's Vision 2030. With this in mind, the study sought to explore the gender challenges as women and youth venture into improved bee keeping by responding to the following specific objectives:

1. To assess who has access to information in improved bee keeping in Trans Mara
2. To identify who has access to management skills on the improved bee keeping in Trans Mara
3. To find out the gender challenges in improved bee keeping value chain (production, marketing and value addition)

2.0 LITERATURE REVIEW

According to IFAD (2008), bee keeping challenges at the village level includes lack of the following; mobilizing beekeepers into groups, access to capital, credit facilities, inadequate training, markets for bee products, inadequate skills in production and processing, facilities and equipment for transport, harvesting, processing, packaging and storage of bee products. A study by Carroll (2006) indicates that the major challenges facing small holder producers in Kenya is the fact that majority are still using traditional hives and those who do use modern ones lack vital equipment such as bee suits and smokers. Likewise, the challenges facing processors and packers include low and inconsistent supplies of honey from disorganized producers.

Sitati and Bett (2012) in a study on evaluation of bee keeping project in Narok Kenya, indicates that the main challenges are lack of skills especially on management techniques and insecurity. Martin *et al.*, (2012) shows that bee keepers in rural areas lack information especially between other members of bee products supply chain. They rely on what the local trader offers and have

little if any, idea of prices paid in larger markets found in towns, cities and export markets. Likewise, bee products that are transported inappropriately and require long travel times have a higher risk of damage and loss in quality. Limited resources of resource poor farmers becomes a serious constraint when considering export markets in particular. Likewise, honey bees are subject to many diseases and pests like any other livestock. The major problem in many countries is that honey bee diseases and pests that do not affect *Apis mellifera* (common bee type), are not fully understood and researched adequately (Martin *et al.*, 2012).

At farm household level, basic processing of bee products may be traditionally managed. However, challenges arises when equipment is required. For example a manual honey extractor may not be available in local areas, and if accessible, its cost may be well above farm household possibilities. As value is added to bee products, not only is training required in improved processing methods for value adding, but quality control and quality maintenance training is also required (IFAD, 2008).

A study by FAO (2006) indicates that packaging is a major constraint to bee product marketing in rural areas where recycled drinking bottles and other packaging materials are sourced locally. These types of materials are unsuitable for wider distribution of bee products to town, city and export markets. Improved packaging materials, for example new glass jars with lids for honey, are not commonly available in many areas and their cost can be high. According to Martin *et al.*, (2012), honey collection centres require not only some form of physical structure like a building and its related costs, but also good management and financial investments. Likewise, organizing widely dispersed small scale farmers in rural and remote requires some initial funding, meetings to take place among producers, travel time and costs, and good communications among the farmers.

FAO (2011) indicates that it is difficult to find extension staff that have been provided with up dated training in such aspects as improved production methods, treatments for diseases and parasites among others. Conducting trainings and distributing training materials in remote areas is a challenge as its costs are high as a result of dispersed small-scale farmers. Monga and Monocha (2011) reported that management of colonies during extreme weather conditions was a constraint experienced by 58.3% of respondents in an Indian study. This study agrees with these scholars whose literature largely concurs with the challenges facing bee keepers. However, the constraints are all gender neutral. For example capital constraint largely affects women in comparison to men especially in access to improved bee keeping equipment. The study therefore sought to the gender gaps in the challenges that men and women are facing in order to suggest ways on how they can be minimized so that the potential of women is also realized.

3.0 METHODOLOGY

Study Area

The study used an investigative survey design. To enrich the investigation, a mixed method approach was most suitable for this study. It provided multiple data collection through in-depth interviews from KIs and FGDs thus, the study was both qualitative and quantitative in nature. The study was conducted in Trans Mara, Narok County, Kenya. The choice of Trans Mara was based on what emanated from a three month scoping study whose stakeholders had met in Kenya Agricultural Research Institute (KARI), Nairobi, in 2009 (Miruka, 2009). They agreed that bee

keeping was one of the five commodities among (Banana, African leafy vegetables, Passion fruits, and Indigenous chickens), that are best placed for increased incomes and food security for resource poor farmers, especially women. The aim was to understand mechanisms for development of gender responsive value chains and Trans Mara was selected as the site to transfer improved bee keeping which has been practiced traditionally for a long time in the area. The target population comprised of farmers who were members in improved bee keeping groups in the study area between 2010 and 2015. The total population was therefore 632 men and women comprising of those who were married, single, widowed and youth.

Sampling Procedure

Stratified random sampling was used for household surveys, key informants and focus group discussions. This being a gender study, it was the best suited procedure. The list of men and women in improved bee keeping groups (632) was obtained from a key informant who assisted in selecting the respondents. The study targeted all the 632 bee keepers who were clustered into the divisions. A total of 180 respondents were selected for the household survey translating into 28% of the targeted population (632), as represented in Table 1.

Table 1: Sample Composition of Household Survey

	Female HH	Men MHH	in Women MHH	in Youth s	Tota l	Targe t	% of target
Lolgoria	11	23	22	22	78	275	28
Angata	8	17	16	16	57	200	29
Kirdon	5	10	10	8	33	112	29
Kilgoris	1	3	4	4	12	45	27
Total	25	53	52	50	180	632	28

For key informant interviews, 16 respondents were purposively selected while stratified random sampling was used to select 36 farmers who were participating in improved bee keeping groups between 2009 and 2015 to participate in FGDs.

Data Collection Methods, Processing and Analysis

For household survey, structured and semi-structured interviews were used to collect data based on research objectives. This was a guided interview which provided an opportunity for further probing and collection of sufficient information. A FGD guide with open ended questions was used to collect information from participants in group discussions. Interview schedules with open ended questions were used for KIIs. Secondary data on bee keeping was collected from Kenya Agricultural and Livestock Research Organisation (KALRO) Trans Mara, which has a component that trains bee farmers in the area. Quantitative data was processed through manual cleaning and then edited. The data was then coded in a book. It was followed by data entry which was eventually analysed using descriptive statistics in SPSS computer software version 20 and excel spread sheet. Qualitative data was processed by cleaning it manually through identification of main themes from in-depth interviews. It was then classified as per the study objectives. Excel spreadsheet was used for further data interpretation. Results were presented in form of frequency tables, percentages, charts and other patterns showing comparisons.

4.0 RESULTS AND DISCUSSIONS

4.1 Access to Information in Improved Bee Keeping

Given that agriculture is knowledge intensive (KALRO, 2017), limited skills contributes to low technology adoption. The study sought to explore access to information by analyzing; access to training; extension services; knowledge concerning migration of bees, pests and diseases control.

4.1.1 Access to Training (management skills) in Improved Bee Keeping

Gender disparities have existed for decades in access to training especially in resource-poor households and most women are usually vulnerable due to the gender related factors that constraint them such as mobility and lack of capital. The study sought to investigate if this is the case in Tran Mara after the introduction of improved bee keeping. (Figure 1).

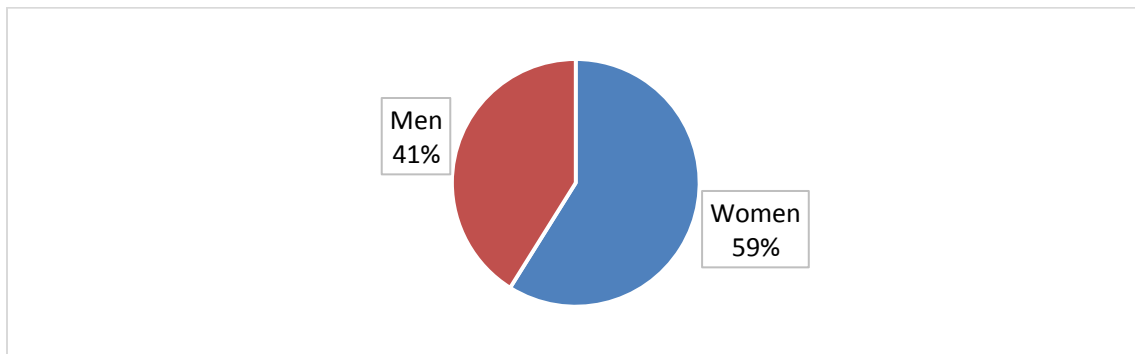


Figure 1: Access to Bee Keeping Training by Gender

More women (59%), in comparison to men (41%), had access to trainings. The study noted that at the initial stages of the improved bee keeping transfer, management trainings were being held on-farm, a scenario attributed to bridging the gender gap in access to trainings especially for women. It enables them to attend trainings if they are offered near their localities, first; due to gender perceptions which deny them freedom and two; due to unpaid workload in households which they also have to perform. In contrast, most studies cite inequalities in access to trainings especially for women, largely due to development interventions' failure to consider these factors. Nevertheless, further findings showed constraints of majority of women who never received the initial trainings and lived far from the demonstration plot in KALRO Trans Mara. They were expected to travel to the place for the skills. The study noted that while most men who lived far were trained, majority of all-women groups were not. They cited constrains in transportation fee and time to travel. To maximize benefits of women's collective action, it is important to understand what strategies are most effective in an all-gender or mixed-groups.

In some context, women-only groups provide spaces where marginalized ones can gain self-esteem, confidence and skills through identification of their needs, understating rights and how to articulate their demands. Developers should therefore use such groups to discuss the diverse types of inequalities suffered by female farmers and how to alleviate them. It was noted that apart from gender related factors, some gender perceptions also play a key factor in this community. Observably, men could not believe all-women groups have anything tangible to

offer visitors without their interjection, a factor that shows how the former trivialise women's knowledge. So, development interventions need to understand such traditions before transfer.

Research has shown that in most African countries, women are constrained by freedom of speech especially in mixed-gender groups; (FAO, 2011; Quisumbing and Pandolfelli, 2010). This is attributed to patriarchal nature that dominates African households and passed through generations thus, apart from factors such as mobility, marital status, and time, women are also facing socio-cultural barriers and gender perceptions. This corroborates Martin *et al.*, (2012) who indicate that in most developing countries, women's participation in commercial agriculture remains low due to cultural and social barriers which do not allow them to benefit from what they produce, and this hampers all attempts to improve production skills and competencies. Bravo-Baumann (2000) asserts that compared to women, men have easier access to technology and training mainly due to their strong position as heads of households and greater access to off-farm mobility. Bearing in mind that agriculture is the backbone of Kenyan economy, women's participation in commercial value chains is key for socio-economic development. The bee keeping interventions should therefore aim to understand the unique needs and social cultural issues constraining each gender in the different communities for enhanced participation and equity in access to benefits hence, minimize gender challenges.

4.1.2 Access to Extension Services in Improved Bee Keeping

Challenges in provision of extension services to resource-poor farmers have persisted for decades, and most women bear the consequence. According to GOK (2009), bee keeping extension services are not effectively reaching the intended end users due to inadequacy in technical personnel and skills, extension materials, funding and lack of transport in the extension system. Consequently, despite the importance of agricultural knowledge in modern value chains, these problems are still persisting yet, extension agents are needed in commercial agriculture more than in traditional value chains. With this in mind, the study sought to find out the situation in the study area thus, suggest the way forward. Findings revealed that out of 178 who responded, more men 110 (62.3%), in comparison to women 68 (37.7%), had received the services. Nevertheless, though more than 30% women had access, men are more yet, the former are new in the enterprise hence, their need for information is crucial. The fact that women residing far from the demonstration plot are challenged in access to trainings suggests the need for extension services that are conducted on-farm.

Notably, when these services are provided on-farm, they are often directed to men on the erroneous assumption that info will trickle "down" to women. In fact, agricultural knowledge is transferred inefficiently or not at all from husband to wife. This is because the communication tends to ignore the unique workload, responsibilities, and a constraint facing female farmers, which corroborates NALEP (2009) that while awareness of extension services, is high among farmers, interaction with agents is low especially among women. Equally, Kimani and Ngethe (2007) indicated that among the *Maasai* pastoralists in Kenya, women's access to extension services are restricted by cultural as well as time constraint. Similar findings were recorded in the 90s in Pakistan (Teufel *et al.*, 1998); in Tanzania; (Due *et al.*, 1997); in Kenya, (Mullins *et al.*, 1996); and India, (Rangnekar, 1998), a scenario which shows gender disparities have persisted for decades, not only in Kenya, but in other developing world and women farmers continue to bear the consequence. According to Mburu *et al* (2013), addressing challenges faced in livestock

sector depends increasingly on an effective and efficient flow of information. If women’s access to agricultural knowledge is more limited or costly than that of men of similar backgrounds, the former may either have less access to economic opportunities or limited engagement in the optimal use of the resources they control.

A recent study on dynamics in adoption of tissue culture bananas in Kirinyag, Kenya, found that extension agents are disoriented in the devolved government hence, taking longer than expected to adjust (Miriti *et al.*, 2018). Consequently, men and women farmers are suffering yet; the need for agricultural information in modern value chains is more in comparison to traditional ones. The inadequacy in technical personnel, skills, extension materials, funding and lack of transport in extension system is also a major setback (GOK, 2009), and to address these problems, the government need to review its strategic plans and policies so as to allocate funds to promote one; sensitisation on improved methods of bee keeping among the existing agents and two; capacity building through development of trainings in beekeeping, for instance, in technical institutions.

4.2 Access to Management Skills in Improved Bee Keeping

4.2.1 Access to Knowledge on Absconding and Migration of Bees

Absconding is the situation where bees leave the hive completely, a frustrating scenario to the farmer who has done so much to get a hive colonised. Information concerning the reasons behind migration and prevention strategies is important. The study sought to find out if both genders have access to this knowledge, including control methods (Table 2).

Table 2: Control of Absconding and Migration of Bees

	N	%	Male (%)	Female (%)
Hive hygiene (keeping it clean)	60	43.5	42	45
Feeding bees in dry season	29	21.0	15	28
Provision of water	23	16.7	17	16
Hanging hives	18	13.0	16	10
Plant necessary trees for nectar	8	5.8	10	1
Total	138	100	100	100

Findings indicate that out of 138 respondents, most of them were maintaining cleanliness in hives to prevent migration, (42% men and 45% women) respectively. Notably, more women (28%), in comparison to men (15%) were feeding bees as a method of prevention. Conversely, other means included; providing water in dry seasons, (17% men and 16% women), hanging hives (16% men and 10% women) and planting necessary trees tar (10% men and only 1% women). These results show that information to prevent bees’ migration is embraced by both genders, a positive impact to the improved intervention. Notably, though women are new in the business, they are enthusiastic in embracing skills which further indicates if they were in similar situations with men, for instance, control of factors such as time and mobility, capital and lack of gender perceptions, women would be at par, or beyond, in realisation of their potential in the enterprise. There is need therefore to consider women’s specific needs and unique challenges at the planning stage of any transfer, which can go a long way in ensuring the realization of their potential, both in participation and access to benefits.

In contrast, a study in Pakistan by Tabinda *et al.* (2013) found that absconding of bees is a major constraint that required time management, which affected women’s participation. It is therefore

inspiring that in Trans Mara, though women’s access to trainings is a challenge, they are not left out in acquiring information on how to control migration of bees, an indication that they are ready to embrace the commercialised bee keeping. Gender inclusive interventions can greatly increase participation of all genders.

4.2.2 Access to knowledge on Pests’ Infestation and Control

Honey bees are prone to pests’ infestation just like other animals. Information on this matter is crucial which should include knowledge on type of pests, reasons they invade bees and how to control them. The rate at which bees are attacked can affect honey production. The study sought to explore men’s and women’s knowledge on the rate of infestation and control methods (Table 3).

Table 3: Rated Pests’ Problem of Honey Bees

	Responses		Gender	
	N	%	Women	Men
Minor	62	35.9	30	40
Moderate	59	34.1	25	36
Serious	21	12.1	16	8
Very serious	19	11	18	16
No problem	12	6.9	11	0
Total	173	100	100	100

Out of 173 who responded, most men (40%), and women (30%) said pests’ problem was minor. Remarkably, those with no pests’ problem are women (11%). Findings showed good management skills, for instance, hive hygiene controls pest’s infestation. As noted earlier, more women, in comparison to men, were keeping hives clean, and this can explain why some of them (11%), had no challenge with pest infestation. Notably, both genders have adopted pests’ management skills, and similar to absconding, it suggests a positive impact, accredited to the improved bee keeping intervention. The study also sought to find out the most widespread pest infestation season since it is heavier in some seasons than others. Knowledge on this information therefore guides men and women on preventive measures for maximised yields (Table 4).

Table 4: The Most Widespread Pest Infestation Season

Seasons	N	%	Males	Females
Long rains	55	37.4	40	43
Dry	39	26.5	21	20
All seasons	31	21.1	22	21
Short rains	22	15	17	16
Total	147	100	100	100

Most bee keepers (40% men and 43% women), indicated that pest infestation is extensive in long rains. Notably, traditional hives are destroyed by water during this period and as a result, more prone to predators, as further findings reveal; majority of men (68%) and women (77%), stated traditional hives are more predisposed to pests infestation, 23% men and 17% women mentioned KTBH, while few stated langstroth (9% men and 6% women). According to O.Is Lelei, Nkilapus, and Tolian, (22/12/2015), compared to improved, traditional hives are constructed with materials that are damaged more easily, as shown in the photo below.



O.I. Lelei with a hollowed tree trunk traditional hive

Traditional hives are made from hollowed out tree trunks. The study noted most women own traditional hives. Consequently, they are constrained by this problem and this continues to widen the gender gap in maximizing yield. One of the reasons to improve bee keeping equipment was to avert the calamities associated with traditional hives such as damages during wet seasons. For this reason, ownership of modern ones maximizes production in terms of yield, increased incomes, and hence, raising community’s living standards. Though most women have embraced pests’ control skills, they may not be in a position to realise their potential in income generation in comparison to those who own modern hives. This is because protective materials used in traditional hives do not prevent water damage thus, creating an environment for pests’ infestation.

Consequently, this impedes women’s participation despite their enthusiasm to acquire knowledge on the business. This calls for an inclusive strategy that will enhance both genders’ potential in accessing improved equipment. Initiatives that encourage sharing resources within households and neighbourhood can assist women’s gradual transition from traditional to improved hives. A number of them have acquired knowledge and putting it into practice will only require a little bit of coaching by those who have been in the business longer. Through empowerment programs, this can be achieved.

Further the study sought to find out and document the methods used by men and women to control pests. This knowledge influences honey production. For instance, lack of this know-how decreases yields since failure to control pests will definitely have devastating effects on honey bees and certainly, a decrease in intended income (Table 5).

Table 5: Methods used by Bee Farmers to Control Pests

	Male	Female	Total %
Hanging of hives	53.1	46.9	100
Hive hygiene (e.g. Cleanliness)	51.5	48.5	100
Greasing	47.7	52.3	100

Findings reveal that while more than half of the men interviewed (53.1%), were hanging hives in order to control pests, a similar number of women (52.3%), were greasing them. The other method used was maintaining hive hygiene (51.5% men and 48.5% women). These results show that similar to bee migration, both genders have embraced knowledge on pests' control methods. The study noted during the initial stages of improved bee keeping intervention, trainings were offered on-farm which ensured women's attendance, hence acquisition of management skills. Further, it shows that women are willing to embrace the improved enterprise so long as their specific needs and challenges are met. Development interventions that will therefore address them in commercialised value chains will not only reap a positive impact for the community, but also the sector.

4.3 Challenges in Improved Bee Keeping Value Chain (Production, Marketing and Value Addition)

4.3.1 Production Constraints

Production stage is key in any value chain especially commercialised ones. This is because failure in this part influences later stages negatively, especially in yields and benefits. The study sought to understand and document challenges facing men and women in this stage. This was achieved by asking respondents to rank the problems starting with the most serious to the least (Table 6).

Table 6: Production Challenges by Gender (percentages)

	Responses		Percentages		Total %
	Men	Women	Men	Women	
Costly labour/ equipment	39	80	32.8	67.2	100
Poor weather conditions	66	48	57.9	42.1	100
Poor hive maintenance	40	73	35.4	64.6	100
Pests and diseases	59	53	52.7	47.3	100
Wild animals/theft	58	42	58.0	42.0	100
Slow colonisation	40	58	40.8	59.2	100
Lack of Pollen	49	49	50.0	50.0	100
Low yield	40	21	65.6	34.4	100
Deforestation	33	20	62.3	37.7	100
Air pollution	32	20	61.5	38.5	100
Land shortage	0	30	0.0	100.0	100

Most women, 80 (67.2%), in comparison to men, 39 (32.8%), were constrained by capital to buy improved equipment and hiring labour. This was followed by poor hive maintenance 73 (64.6%) women in comparison to 40 (35.4%) men and slow colonisation 58 (59.2%) women compared to 40 (40.8%) men. Observably, no man was challenged by land; all are women 30 (100%). These results can be attributed to what the study noted. Income from bee products, including productive assets such as land, were highly controlled by men who also perform most bee keeping activities. Consequently, majority of women are forced to higher male labour which majority could not afford. This resulted to poor hive maintenance and slow colonisation, a challenge most all-women groups complained about as shown in this photo.



A widow's bee keeping group in their poorly managed apiary.

The scenario above is attributed mainly to neglecting gender related factors that constrain majority of resource-poor women and in most times, it negates the intended impact, a fact corroborated by Sitati and Bett (2012). The scholars argue that poorly planned and rapid expansion of improved bee keeping projects usually result in many un-colonised bee hives due to poor maintenance, and this leaves women and youth who are new in the business often making huge losses. Such a move in turn impacts negatively on income generation, and certainly adverse gender effects not only on women, but the whole community. For instance, the study noted that improved hives were given to groups with an aim of increasing the equipment later. However, while all-men and mixed-gender groups increased theirs, most all-women did not. With prevalence of poverty in the study area (GOK, 2010), such an initiative (free equipment), cannot have much impact because majority of bee keepers will use any extra income for immediate needs, leaving no room for improvement. However, through empowerment initiatives that target sharing of existing resources, this can change. For example, men can be sensitised to sell some livestock, after which income is shared jointly in the household, or borrowed as low-interest loans by neighbours. They can use it to enhance improved bee keeping. With such awareness, labour can be shared too which will not only minimize women's challenges, but increase their participation.

PACT Kenya (2011) confirms these results. They affirm that unlike men who practice bee keeping as individuals, women practice it in groups of mixed gender. This is because most activities are carried out by men which disadvantages their participation since they have to hire labor for most of the bee keeping activities. As a result, women incur average production costs that are higher than that of men. According to Waithanje *et al.* (2013), as agriculture and livestock production become more commercialized, women farmers may not be able to compete with, and benefit like their men counterparts. The former have lower access to resources, including capital, than the latter, and they experience other social cultural and economic barriers.

4.3.2 Harvesting, Processing, Packaging and Value Addition Constraints

These stages play a crucial role in achieving the goal of increasing income and raising the living standards in the study area. Research has shown that processed and value added products earn more income in comparison to selling raw honey. The study sought to find out and document the challenges faced by men and women in these stages (Table 7).

Table 7: Harvesting, Processing, Packaging and Value addition Challenges (%)

	Male	Female	Total %
Costly packaging materials	40.1	59.9	100
Costly processing equipment	55.7	44.3	100
Poor harvesting equipment	68.7	31.3	100
Lack of processing/value addition skills	29.7	70.3	100
Poor storage of honey	60.8	39.2	100
Contamination during harvesting	50	50	100
Costly harvesting labour	0	100	100
Customer preferences	49.3	50.7	100
Lack packaging skills	0	100	100

Findings show that majority of women (70.3%) in comparison to men (29.7%), were challenged by processing as well as value addition skills. Conversely, most men (68.7%), compared to women (31.3%), cited poor harvesting equipment while others mentioned poor honey storage; 60.8% men compared to 39.2% women. Notably, only women had challenges with costly labour and lack of packaging skills. These findings validate earlier results. Most women's constraints were related to capital and trainings. Men, on the other hand, earn extra income from cattle and thus, not affected by gender, including cultural related factors.

Capital constraints can be attributed to high poverty levels prevailing in the area as stated by GOK (2010). In Trans Mara, poor households are more (53.7%), compared to non-poor (46.3%), and on average, the former have big families compared to the latter. The forms of poverty experienced are absolute and hard-core with a major effect of high rate of school dropouts as parents cannot meet education costs. While both genders are affected by this scenario, given the option of not educating children, girls are more vulnerable due to gender and cultural stereotypes in the study area. Culture dictates that girls marry and hence, young ones are forced into early marriages which denies them access to education. The county government can introduce initiatives to educate illiterate young men and women who are already embracing education through taking their children to school. Knowledge is key not only in agribusiness, but also in assisting their school going youngsters. This will eventually improve the conservative nature of the community and impacts positively on the socio-economic development. Research has shown that empowered women not only impact in their families, but also in their communities.

Other studies have shown similar results though they are gender blind. For example, in Uganda, Mujuni (2012) shows that harvesting labour cost was ranked high by more than half beekeepers yet, it is considered one of the least labour intensive farming activities. IFAD (2008) affirms that though processing bee products may be traditionally managed, challenges arise when quality equipment is required, and if accessible, its cost is above farm household possibilities. FAO

(2006) indicates that bee products in rural areas are packaged with unsuitable materials because quality equipment's cost is high hence, not accessible by farmers.

Consequently, all these challenges are related to capital constraints which is affecting women more, in comparison to men. Accordingly, some studies conducted more than a decade earlier are showing similar challenges which are still persisting in the improved enterprise. This is mainly due to many projects' tendency to ignore gender and development (GAD) during transfer, which entails being aware of the specific as well as unique needs and constrains facing both genders in a community, especially those that deter access to improved enterprises and technologies. If stakeholders will continue to ignore this fact, bee keeping challenges will not only prevail longer, but also the vision to increase income and raise the living standards in these communities will not be realised.

4.3.3 Marketing Constraints

In any commercial enterprise, marketing outlets play an important role. Their availability and accessibility influences individual's access to income from the business. Research has shown that some channels offer better prices than others thus, preferred by most men and women depending on factors such as proximity and profitability. The performance of the sector therefore depends on marketing channels that are available to bee keepers. With this in mind, the study sought to identify and document the unique challenges faced by both genders in marketing bee products (Table 8).

Table 10: Marketing Challenges by Gender

	Male	Female	Total %
Lack of ready market	49.4	50.6	100
Price fluctuations	59.9	40.1	100
Middle men	35.5	64.5	100
Poor rural infrastructure	55.2	44.8	100
Lack of advertisement skills	55.6	44.4	100
Low market demand	44.1	55.9	100
Bad roads in rainy season	42.1	57.9	100

Findings illustrate both genders are facing similar marketing constrains. However, more women (64.5%), compared to men (35.5%), are challenged by middlemen. Other constrains were; lack of access to ready markets including product advertisement, price fluctuations and poor infrastructure especially bad roads in rainy seasons. This suggests marketing problems are a major setback in the study area. The improved enterprise is meant to earn income among participating men and women.

The study found that different channels were offering varied prices. According to O.Is Lelei, Bett, Kanda, Tolian, *et al.* (24/12/2015), wholesale and cooperative channels were offering the best prices, followed by local retail shops and open air markets. Middle men and local consumers were offering the lowest due to the fact that they were buying on-farm. The study therefore sought to find out who had access to these channels (Figure 2).



Figure 2: Access Marketing Channels by gender

Figure 2 shows that while majority of men were privileged to source for outlets which offer better returns, most women were not. They could only access those that were buying on-farm yet they were offering the lowest returns. This is attributed to challenges in mobility and time due to largely, gender perceptions and household chores. The study found out that men in the study area could not allow their spouses to travel far due to mistrust issues.

As earlier noted, a gender strategy is important before transfer of the improved enterprise. It can include an analysis of the existing outlets, accessibility, and their effects to both genders. In most cases, interventions introduce technologies without considering any marketing strategies. This eventually impacts negatively to both genders due to either overproduction, or unreliable markets. Such situations are preventable if development projects will uphold gender responsiveness before transfer, and it can minimize enormous losses incurred by resource-poor farmers from technologies that promise huge benefits, only for them to realise there are no markets. According to Martin *et al.*, (2012), bee keepers in rural areas rely on what the local trader offers and have little information if any, on the idea of prices paid in larger markets found in smaller towns or cities. Quisumbing and Dolfelli, (2010) argue that women face many gender-specific challenges in access to markets. So, market-oriented interventions need to address gender norms that place women at a disadvantage when seeking new market opportunities.

In conclusion, most men's challenges are catastrophes such as poor weather conditions, pests and diseases, theft, deforestation and air pollution. On the other hand, women's constrains are related to capital, for instance, lack of access to equipment and labour. Similarly, whereas most women are challenged by middlemen, men's constrains include unreliable markets and lack of product advertisement. Bad roads is a problem to both genders. This suggests both genders' challenges are diverse, and the solutions should focus on their unique needs. The government of Kenya realises that agriculture is the backbone of the economy in its four main agendas, among which is to be food secure by 2022. Bearing in mind that women's labour in the sector is more, in comparison to men's, food security will be realised if gender is recognised as key in agricultural production. The development interventions should therefore ensure premeditated gender responsive programs in any value chain, from production to marketing, including value addition. This is especially so for pro-poor agro-enterprises, bee keeping included. With this in mind, not only will the country be food secure sooner than expected, but the standard of living will rise in rural areas.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Analysis suggest that more women, in comparison to men, had received management trainings in improved bee keeping due to the fact that initially, they were being held on-farm which enabled many to attend. Further findings revealed that bee keeping groups who did not received initial trainings were expected to travel to a demonstration plot in KALRO Trans Mara in order to obtain skills. However, while most all-men and mixed-gender groups were trained, almost all-women groups who lived far could not travel due to lack of transportation fee and time, factors that continues to widen the gender gap not only in access to information, but participation in improved bee keeping value chain.

Findings reveal that in production stage, all genders have embraced management skills and the major challenges are access to capital and catastrophes such as theft, poor weather conditions, pests and diseases. Women and youth are more constrained by capital to buy improved equipment and hiring labour. In the study area, older men control income from large herds of livestock hence, money is not a major problem. In value addition, the issue is lack of awareness on honey products since majority of men and women received the skills. In marketing, the major constrains were middle men, transportation cost, lack of ready markets and price fluctuations. Consequently, women were challenged by these factors more than men

5.2 Conclusions

More women in comparison to men, had received the initial management trainings in improved bee keeping due to the fact that they were being held on-farm, a factor that bridges the gender gap in access to trainings. However, at latter stages of the project, men and women who did not receive initial trainings were expected to travel to KALRO Trans Mara to receive the same. Consequently, while majority of men were trained, most all-women groups who resided far never received any trainings. They were challenged by capital to travel, and gender related factors such as mobility, and time, including gender perceptions. Regarding access to extension services, women were also vulnerable yet being new in improved bee keeping, access to these services is paramount. Findings reveal that in production stage, most men's challenges are catastrophes such as poor weather conditions, pests and diseases, theft, deforestation and air pollution. On the other hand, women's constrains are related to capital, for instance, lack of access to equipment and labour. Similarly, whereas most women are challenged by middlemen, men's constrains include unreliable markets and lack of product advertisement. Bad roads is a problem to both genders. This suggests both genders' challenges are diverse, and the solutions should focus on their unique needs

5.3 Recommendations

The study recommends that bee keeping interventions should purpose to understand the specific challenges and cultural factors that constrain both genders in communities. For example, needs of an all-women group are different from mixed gender, especially if travelling to access trainings is entailed. Improved bee keeping has potential to employ most vulnerable people who have been marginalised in crops agriculture, majority who are women and youth, a key factor to take gender seriously.

In extension services, the government should allocate funds to promote one; to sensitise existing agents on gender responsive methods of improved bee keeping and two; capacity building through trainings e.g. technical colleges can have short-term courses on bee keeping e.g. by training men and women TOTs. The long-term should ensue increase of extension agents who are currently few in the system.

To enhance access to trainings, bee keeping interventions in corroboration with MOA and county government should construct demonstration trials within the localities where extension officers and TOTs can relay information to men and women bee keepers.

In access to capital, bee keeping initiative, in partnership with county government and local leaders should have forums to empower both genders on importance of joint sharing of productive assets. For instance, in Trans Mara, men can be encouraged to sell cattle after which profits can either be shared in the household, or as informal low-interest loans amongst neighbours, who should then enhance bee keeping. With such awareness, labour can be shared freely, and this will minimize women's challenges in capital constraints. Low interest loans can also be introduced through the marketing associations.

In marketing, the bee keeping initiatives in corroboration with county government should improve roads, construct on-farm resource centres, both for trainings and collecting bee products, and at the same time, conduct deforestation and air pollution awareness such as "cut a tree, plant two".

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