

Quality Focused Apiculture Sector Value Chain Development in Ethiopia

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Abstract: Ethiopia is an “apiculture country” with more than 10 million honey bee colonies. Ethiopia is also a “honey country”; the annual honey and beeswax production potentials are 550,000 and 50,000 metric tons, respectively, with about one tenth actually produced. Since 2008, Ethiopia is EU “third country” listed for the export of honey. However, the national research system identified serious bottlenecks, such as traditional smallholder level production with very low productivity and problematic supply chain; quality issues, including adulteration; lack of access to credit; constrained input supply chain and input quality issues. This paper illustrates how quality defects have been addressed in a quality focused value chain development (VCD) approach, with focus on: creating a favorable policy ground; implementing regional, national and continental multi-stakeholder-platforms (MSPs) for dialogue; information and knowledge sharing and sector advocacy; strengthening supportive sector organizations along the value chain; networking and market intelligence, including exposition and conference organization; expansion of research centers and activities; laboratory qualification for international accreditation. Many components are implemented through the largest national apiculture sector development programme called Apiculture Scaling-Up Programme for Income and Rural Employment (ASPIRE), which transfers innovations to more than 30,000 beekeepers. Among others, ASPIRE was instrumental in qualifying national testing facilities, which in turn led to product quality improvement. However, more action is required in the fields of business-to-business (B2B) linkages, research, education and training, as well as in making so far voluntary practices mandatory. This also calls for full traceability and routine quality testing along the value chain.

Key words: Ethiopia, apiculture value chain development, product quality.

1. Introduction

Beekeeping in Ethiopia is one of the ancient agricultural activities, facilitated by unique agro-ecological conditions and more than 7,000 flowering species of tropical, subtropical and temperate plants, including deciduous fruit trees, many of which providing unique and abundant bee forage [1]. There are over 10 million bee colonies and 1.8 million beekeepers. However, apiculture is largely practiced in the traditional way with approximately 95% of all bee hives remaining round (log or basket) hives (Figs. 1 and 2) [2]. Owing to these practices, Ethiopia has a huge untapped potential in the apiculture sector. The estimated production potentials of the country are 550,000 metric tons for honey and

50,000 metric tons for beeswax [3, 4], out of which only one tenth is utilized, and other valuable api-products, such as pollen, propolis, etc., are neglected. Yet, Ethiopia has placed herself among the world’s leading apiculture countries, positioning the country among the top 10 honey producers and ranking the 4th in wax production [5]. However, the sector generally lacks proper understanding regarding product quality and quality defects, not only in the production system, but also in postharvest practices and marketing, including excess smoke and adulteration [6]. In order to address this, supportive apiculture policies have been put in place, research and extension systems are expanded and a number of the country’s universities offer apiculture courses, including M.Sc. programmes. Research undertaken during the country’s efforts to access the EU market for Ethiopian honey, as in 2008, the country has been

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Fig. 1 Traditional beehives in a forest (Western Ethiopia).



Fig. 2 A traditional beehive in a backyard (Southwestern Ethiopia).

listed as a third country for the export of honey and conducts annual Residue Monitoring Plans (RMP) and testing of honey for residues [3], again highlighting quality defects in honey both in the domestic as well as in the export market [6, 7]. Research also revealed that agro-chemicals are increasingly applied in the Ethiopian grain belts, where apiculture is also practiced [8, 9]; this poses a risk to bee's health and their product as well as to consumers' health, and endangers the systematic development of lucrative export markets.

Addressing quality deficits in food, produced by millions of resource poor smallholders, requires holistic thinking and systemic approaches. It requires an understanding of the role of each actor involved in adding value along the chain and where quality issues have to be addressed [10]. It also requires well

organized and competent structures along the value chain (at the different levels of operation). In the effort to address this particular issue, sector associations have been established in Ethiopia to assist and accelerate sector development activities [11].

In this paper, key actions are highlighted at specific points of the value chain, which are indispensable for quality assurance. Quality inputs, a suitable policy framework and its enforcement (through competent food safety control and laboratory investigation mechanisms) which assures quality at the source, active and competent sector actors who provide services, business linkages and transparent marketing, and the response to consumer's demand are essential components of quality assurance.

Making (and keeping), such complex operational system, requires a well-functioning sector, underlining that sector development is a key component of value chain and quality development.

2. Principles, Concepts and Components of Value Chain Development (VCD)

Academics, policymakers and development practitioners began to apply the value chain concept about two decades ago to help them better understand and engage with the complex web of stakeholders involved in stimulating economic development and ultimately in poverty reduction. Key to the approach is to identify opportunities for VCD based on market demand and requirements, particularly benefiting small holder farmers/beekeepers and facilitating relationships between chain actors to make optimal use of these opportunities [10]. One of the key lessons learnt from decades of often disappointing results is that the demand for commodities produced by small-scale farmers/beekeepers (honey in this specific case) should be the driver for designing and supporting productivity increase interventions embedded in quality improvement initiatives.

Quality assurance at source is the key success factor. It is market driven. Interventions that seek to enhance

the productivity of smallholders and the quality of the products which they produce, both reflected in the household income, must ensure that there is a demand (a market) for the produced commodities.

Markets, specifically the creation of market linkages and the establishment of business relationships which demand value added quality products, are the driving forces of VCD.

In this paper, the selected interventions in key areas of VCD will be focused on and then demonstrate how they assure product quality improvement at different levels of operations, or in other words, how operators at these levels (input suppliers, producers, their organizations, traders/processors/exporters and market actors) are encouraged and guided to work towards quality improvement.

Agiculture value chains (in this case limited to honey) are characterized by five levels of operations or operators: (1) input suppliers, (2) producers, (3) producer organizations, (4) traders/processors/exporters and (5) retailers/consumers (markets).

Addressing quality issues and quality improvement at each level requires interventions in the following four key areas of VCD:

(1) Sector development—establish and operate the framework with the following focal areas:

- Facilitating the establishment of multi stakeholder platforms (MSPs) for all value chain actors;
- Strengthening of value chain sector associations;
- Generating and disseminating market intelligence and market linkage/opportunities;
- Supporting effective public policy management to create a conducive policy framework;
- Promoting appropriate technology development and accessibility;
- Financing value chain actors.

(2) Business development—turn opportunities into results:

- Private sector actor strengthening (from production to market);

- Business-to-business (B2B) development support;
- Producer group strengthening (cooperatives, unions, federations);
- Value chain financing (loan guarantee, etc.).

(3) Knowledge development, innovation and learning—injecting professionalism in an innovation system:

- Knowledge development and learning agenda;
- Knowledge development mechanisms.

(4) Service provider (BDS) development—sustainably up-grading the value chain:

- Increase the supply of effective and efficient private and public services;
- Create more demand for these services in order to up-grade and up-scale the value chain without external support.

3. Achievements in the Key Areas of VCD

The Ethiopian experience shows that quality issues in food products, such as honey have to be addressed in a holistic approach at the different levels of the value chain, in the key areas of VCD: sector, business, knowledge and service provider development. These approaches are governed by the sector itself through action plans developed and implemented by coordination groups or MSPs at continental, national and regional level on the one hand and by embedding them into coordinated national development strategies on the other [4, 12]. Examples for the latter, for instance, are the “Productive Safety Net Programme” (PSNP), “Sustainable Land Management Programme” (SLMP) and others [13].

Focused, diversified, continuous and coordinated national and international sector promotion and marketing activities triggered the awareness of the public, government and development actors in Ethiopia regarding the potential and the role of beekeeping in the country, and about the nation’s vast opportunities of placing quality products in the international apicultural community [14]. Currently, the government places stronger emphasis than ever

before on the apiculture sub-sector in order to strengthen beekeeping practice as a tool for poverty reduction and to diversify the national export [15].

3.1 Sector Development

As far as sector development is concerned, sector associations, like Ethiopian Beekeepers Association (EBA) recently re-organized into the Ethiopian Society of Apiculture Science (ESAS), Ethiopian Honey and Beeswax Producers and Exporters Association (EHBPEA) and Ethiopian Apiculture Board (EAB) have been established to assist in and accelerate sector development activities [11].

Consequently, concern and engagement of government and development partners improved, and engagement and investment by the private sector increased. Policy makers assured the protection and development of apicultural resources [16, 17], regulated import, registration and use of pesticides and drugs [18-20], established national standards for api-products and api-inputs [21-23], and are finalizing the proclamation of a honey marketing framework and its regulation for implementation [24-26]. Regional and national MSPs helped to raise awareness and address priority issues in the sector, identify ways out of identified problems and share tasks identified among the actors. The MSPs have been firmly established as value chain governors [4, 11]. This has helped the sector to shift from top-down to bottom-up, in a holistic manner. Awareness raised by the MSPs included banks, savings and credit institutions, which started offering loans not only for capital goods but operational expenses; this had a direct positive influence on quality management at company/processor level, and consequently of the performance of producers partners [27].

Women and youth started increasingly being engaged in beekeeping business [4]. Trainings on modern beekeeping management provided to farmers helped them to improve their apiary management and produce better quality hive products, addressing

harvest, postharvest and storage quality management at the source.

The changes were market driven. Ethiopia is leading membership in Apitrade Africa; the presence of Ethiopian value chain actors in domestic (ApiEthiopia Expo), regional (ApiExpo Africa) and international events (BioFach, Gulfood, SIAL, Apimondia conferences and congresses) turned the attention of value chain actors to the desired products with required quality and encourage them to supply such products [14, 28].

3.2 Business Development

In the area of business development, concrete business deals ensured that smallholder producers benefited from improved market opportunities created by the above-mentioned broader sector development interventions. Apart from the linkages created in the context of Apiculture Scaling-Up Programme for Income and Rural Employment (ASPIRE) [27, 14], (also see below: many of which are now self-sustaining), the focused development of the Ethiopian apiculture sector attracted one of the major international buyers (Tuchel & Sohn GmbH, Germany) to engage in business agreement with Ethiopian smallholder producers through their producer organization (cooperatives and cooperative unions). The framework is a so-called “public private partnership project”, where quality improvement is the single most important requirement for its establishment and operation. Collaboration and a business relationship established between a producers cooperatives union (Zembaba) and another European importer (PARODI, Italy) is the other reflection of how the quality focused development efforts are producing desired changes. Value chain financing provided by the partners themselves creates quality infrastructures in the areas of harvest, postharvest, storage and traceability of products; strengthens the producer groups in establishing such structures; transfers technology and works towards a sustainable

business relationship [27]. One of the requirements of such programme is the permission of “third countries”, i.e., non-EU countries, to export animal products into the EU.

Honey is an animal based product. Ethiopia managed to obtain the permission of exporting it to the EU member and associated countries. This was based on the submission of annual RMP, which serves to establish credibility on the quality and safety of animal based products.

In the case of Ethiopia, annual RMP backed by annual examination of honey for residues, such as pesticides, heavy metals, antibiotics, etc., according to the EU directive 96/23/EC [29], regularly submitted to the EU, consistently proved the absence of residues in Ethiopian honey and resulted in “listing of Ethiopia as a third country for the import of honey into the EU”. The country remained in the third country listing of EU since it was first listed in 2008 [30]. Part of the RMP deals with the existence and operation of quality assurance mechanisms at the national level, which was convincingly proven. The “quality concept” (awareness and implementation) of producers and other downstream value chain actors was continuously improved following various trainings and extension activities, and by support provided on the part of the processors following the HCCP, ISO and organic certifications of their facilities and products. This in turn helped keeping the EU market open for Ethiopian honey. The first ever EU export of 30 tons of Ethiopian honey reached the UK in 2008. Demand for Ethiopian honey expanded and export reached up to 900 tons per annum.

3.3 Knowledge Development

Business development does not work without continuous knowledge development, innovation and learning injecting professionalism in an “innovation system”. Once the business framework is understood, its components are addressed in a way that fosters professionalism in order to include support for

specific studies, market research, developing and disseminating new technologies, products, services, business arrangements and management systems in an “innovation system”. Again, the quality of products and its assurance is the tool for this area’s development [31].

Knowledge development and learning needs agendas and mechanisms. It is a vast area which can not be covered in detail at this point. Netherlands Development Organization (SNV), in its successful “support to business organizations and their access to markets” (BOAM) programme, measured the success in knowledge development and learning as “the success of value chain actors in developing their own latent capabilities and combining them with favorable external factors, such as market opportunities, hence creating the right conditions for enhancing a range of related capabilities” [10]. It has a lot to do with networking to achieve common goals. The EAB, in collaboration with SNV and the private partners ProFound (market related aspects) and Enclude (finance related aspects), launched the country’s biggest five year project known as ASPIRE to close knowledge and skill gaps of directly targeted smallholder beekeepers and “copycat” beekeepers, specifically addressing the business development services (BDS) problem, lack of credit/finance, loose producer-processor market linkage, quality issues in hive products and inputs, supply chain problems for inputs, international market linkages and their promotion and the institutional capacity of sector associations [14, 27]. The ASPIRE approach covers the whole broad range of market research based knowledge development and operates in partnership with input providers, traders and processors, public and private extension services including laboratories and exporters [32]. It combines, in fact, all the four key areas of VCD and is successful. It reached over 30,000 direct beneficiaries and more than 25,000 “copycat beekeepers”; and linked (networked) them to markets via established processors/exporters who at

the same time engaged in services, input provision and capacity development. This linkage came also about through “learning visits” both locally and abroad, and through participation in numerous regional and global sectoral events.

It built heavily on the support in expanding research centres and research capabilities, and on including research and researchers in action plans of the sector [27].

Innovation systems require “interactive knowledge processes” which connect the value chain actors [10]. Supporting and piloting innovative ideas in the sector improvement efforts are important in this process. The EAB has launched the only programme addressed exclusively to women (Fig. 3), “Female Graduate Beekeepers Fostership Programme”, in collaboration with the agriculture related universities, to foster



Fig. 3 Female graduates trained in postharvest quality management.



Fig. 4 Laboratory capacity development.

entrepreneurial beekeeping, to inject professionalism to the traditional management dominated apiculture sector and create model beekeepers and trainers for rural women [32, 33].

Value chain actors are connected through continental, national and regional MSPs as described in the chapter on sector development. The first sector newsletter, the API-News published by EAB, appears quarterly and serves as a platform for information and knowledge development and sharing, alongside the Api-Business Directory of Ethiopia which is now available in its second edition [11]. The website of the EAB (www.ethioapiboard.org) presents case studies on successful market access and its requirements.

3.4 BDS Development

Strengthening providers of BDS addresses a wide range of services used by entrepreneurs to strengthen and develop their business [10]. BDS development is a requirement for sustainably up-grading the value chain and (product) quality assurance.

Service providers include various actors in the areas of technology, finance and economy, among others but not limited to public and private extension organizations and services; auditing and accounting firms and personnel; business trainers; quality assurance and control services, such as laboratories, food safety, standard and conformity assessment agencies, consultants; research organizations and others. The following examples illustrate the important role of strengthened BDS in quality assurance.

In the section on business development above, it was mentioned the successful listing of Ethiopia as a “third country” for the honey export into the EU, which is based on the submission of RMP. Part of the annual RMP is the residue analysis of honey in an internationally accredited laboratory. The absence of such laboratory in the country made the analyses costly and complicated. Tackling this problem is a good illustration of how the improvement of BDS

provision addresses the product quality issue and how it can be instrumental in solving quality deficiencies (Fig. 4). Project (externally financed) VCD activities helped prioritizing the issue and helped increasing the supply of effective and efficient private and public services, for which a demand existed because of the EU market opportunity for Ethiopian honey.

From the organizational point of view, the issue was addressed by a task force under the Ministry of Agriculture which led to massive capacity development at the level of local public and private laboratories. Currently, the capacity of laboratories is improved and expected to obtain international accreditation for residues and full honey analysis [32]. This will help deal with quality issues more easily and building confidence of market actors to ensure quality honey in the market. The ASPIRE project worked hard to enhance quality laboratories all over the country and to eventually help establish an internationally accredited laboratory for chemical residues. As the laboratory services are a requirement for the processors to export to the EU [29], these services will be demanded, paid for and help up-grade and up-scale the value chain without external support. Following the logic of self-sustaining value chains, the producers, in turn, will continue to get better prices for their products and will be encouraged to work for more volume and quality of products to improve their livelihood through better income from their beekeeping activity.

Other BDS efforts have been quality focused, too. Institutions, like the Ethiopian Standards Authority (ESA, formerly QSAE) [21-23], Ethiopian Conformity Assessment Enterprise (ECAE), Food, Medicine and Health Administration and Control Authority (FMHACA) and analytical laboratories, which all could help to ensure quality of hive products, have been established (ESA, ECAE) or strengthened (FMHACA) [30]. Harmonized Ethiopian honey, beeswax and beehives standards have been developed, distributed and reviewed [21-23]. The processing

companies are familiarized with and employing HCCP, ISO, FairTrade and organic certification systems. As mentioned previously, annual residue monitoring plans for honey and their regular submission to EU Directorate General for Health and Food Safety (SANCO) are in place.

As part of the SNV-BOAM programme, apiculture training manuals have been developed in English and three local languages, at three different levels [34]. They can be purchased from the office of ESAS, formerly EBA. Guidelines/manuals for quality production, harvesting, postharvest management and processing have been developed in local languages, through the ASPIRE project, to help producers and other actors establish quality concepts [35, 36]. To add up on these continuous quality oriented development efforts, a national proficiency testing programme through the Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ) supported National Quality Infrastructure (NQI) programme, is underway. Proficiency testing is a quality assurance tool that demonstrates competence to the public, assists in producing reliable data and takes remedial action if needed. It is also a requirement for accreditation according to ISO/IEC 17025 [37]. Its application strengthens the reliable delivery of quality analyses of laboratories all over the country. Exposure and learning visits (for instance, including all relevant international trade fairs) have been arranged for the actors to help them learn from technology developments and experiences of better performers and develop insight on quality and other related issues. A “quality label” for Ethiopian honey is under preparation and so is the concept of a “honey competition” on the occasion of the national sector event “Api-Ethiopia Expo”.

Specialized consultancy firms with a track record in apiculture business development are in place and busy.

In summarizing, it can be stated that focused, diversified, continuous and coordinated national and international VCD based sector promotion improved

the awareness of the public, government and development actors in Ethiopia regarding potential and role of beekeeping in the country, and about potential and quality products of the nation in the international apicultural community. Therefore, concern and engagement of government and development partners improved, and engagement and investment by the private sector increased. Regional and national MSPs helped to raise awareness and discuss issues and problems in the sector, identify ways out and share tasks identified among the actors. Women and youth started increasingly being engaged in beekeeping business. Trainings on modern beekeeping management provided to farmers helped them to improve their apiary management and produce better quality hive products. As a consequence of this engagement and investment in the sector, all value chain actors are aware and competent to produce quality honey. Increasing exports to the Middle East and the EU underline the success of these efforts. The presence of two of the major EU honey importers in Ethiopia—their only partners in Africa, is a further proof of the “success story”.

4. Conclusions

The study documents the need and the potential to address quality improvement of food products, such as honey in this case, in a value chain context. Value chains are market driven. Markets demand traceability and quality. Ethiopia has achieved a remarkable success in this context by being listed as a third country for the export of honey to the EU market and actually selling honey in a number of EU countries since 2008.

The findings suggest that quality starts at the source and can be assured throughout the four key areas of VCD—sector development, business development, knowledge development and service provider (BDS development), if traceability is assured and good practices are applied at all levels.

Quality assurance requires qualified (accredited)

laboratories and the support by policy makers through the necessary legal framework, including the establishment of supervisory and regulatory bodies and an apiculture directorate in the newly created Ministry of Livestock and Fishery. The study suggests that these support structures exist and they were instrumental in achieving the quality improvement of Ethiopian apiculture products over the last decade.

However, quality defects have not yet been completely overcome. More efforts are needed to enforce the existing quality regulations, and in this context, create better traceability procedures. This would include:

- (1) Routine testing of products, alongside with the inspection of facilities and operating procedures;
- (2) New approaches to correct domestic marketing shortcomings (new proclamation and regulation are drafted);
- (3) Boosting knowledge development and learning creating professionalism (M.Sc. courses, technical and vocational education);
- (4) Targeted research and development activities, for instance, the creation of new products with specific properties and qualities, such as mono-floral honeys, branded honeys, etc., as this will contribute to continuous quality improvement.
- (5) Improved and much closer producer/processor linkages (B2B relationships), such as contract beekeeping and out-grower arrangements.

All of these efforts would require investment. This investment is justified in view of the vast and increasingly unmet demand for quality apicultural products in domestic and international markets. It is noteworthy that Ethiopia, at present, only uses 10% of its apicultural resources.

Marketing higher quantities of quality apicultural products will massively support the government's poverty alleviation measures through apiculture.

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