

Governance of the Business Ecosystems to Commercialize Beekeeping Activities in Emerging Markets

Nicholaus Bhikolimana Tutuba
Mzumbe University

Hawa Petro Tundui
Mzumbe University

Jasinta Samwel Msamula
Mzumbe University

Business ecosystems do not occur naturally, it needs an orchestrator to align and govern actors to co-create value and appropriate value. This qualitative action research analyzed the structure and governance of the beekeeping industry in Tanzania. The transaction-based market relations should be changed to a collaborative model by aligning value chain actors in the beekeeping industry through the honey collection centre. Also, the value should be appropriated and shared among participating firms in a fairly and truthful way. The orchestrator should make sure that beekeepers join and stay in the ecosystem. Policymakers, researchers, and organization should adopt the ecosystem-as-structure approach to build and govern a commercial beekeeping ecosystem.

Keywords: beekeeping, governance, business ecosystem, Tanzania

INTRODUCTION

Tanzania has natural vegetation and about 35 million hectares of forests suitable for beekeeping activities (Mwakatobe, 2006). But, the forest resources have not yet fully contributed to the wellbeing of society. Msamula et al., (2018) argue that “*forest resources do not at present provide a sufficient contribution to the economy*” (p. 188). Likewise, the beekeeping sector, which is part of the forest resources, remained less productive and not well governed (International Trade Center [ITC], 2015; Tutuba et al., 2019a). The beekeeping firms with limited skills, resources, and capabilities like beekeepers remained poor as they cannot efficiently create value and compete in the market (Tutuba and Vanhaverbeke, 2018; Tidd and Bessant, 2018). Therefore, beekeepers should team up [collaborate] with partners with complementary skills and assets (Tee and Gawer, 2009; Vanhaverbeke, 2017) to efficiently create value and capture a sizable part of the value that is created in the industry. But this approach does not happen automatically, it needs an orchestrator to align, organize, and coordinate different organizations to deliver a value proposition (Moore, 1993; Adner, 2017; Kapoor, 2018). To understand such strategic dynamics, we need to understand how ecosystems are structured and governed because

activities in an ecosystem and its success are affected by the rules of engagement, boundaries, and the nature of standards (Adner et al., 2013; Furr and Shipilov, 2018). Therefore, this study sets out to analyze the governance structure of the business ecosystems in the beekeeping industry in Tanzania. Specifically, the study set to answer the question of how the beekeeping ecosystem is organized and governed to create value and capture value in Tanzania?

Following this introduction, this study is organized as follows: first, we outline the core concepts to include the beekeeping industry in Tanzania, business ecosystem, governance, and business and governance. Thereafter, we present the methodology and approach, followed by study findings. Then we offer the interpretation of the findings. Lastly, we summarize the main findings, the limitations of the study and explore different directions for future studies.

The Beekeeping Industry in Tanzania

In Tanzania beekeeping have been practised and governed for many generations and through different structures. For example, during the colonial era, the beekeeping sector was governed through government decrees (Ntenga, 1976; Tutuba and Msamula, 2018). After independence in 1961, and following the *Arusha declaration* in 1967, the sector was governed by the beekeepers through cooperatives (The Arusha Declaration, 1967; Match Maker Associates [MMA], 2007). In 1973, Tanzania adopted the strategy to govern the sector through crop authorities, mostly known as *crop board*, which were unable to deliver what was expected of them. Their inefficiency became a prime cause of the fall of so many farmer associations and cooperatives in the early 1990s (Arkadie, 1995). In 1998, a national beekeeping policy was formulated. Responsibility for beekeeping was transferred to the Ministry of Natural Resources and Tourism (URT, 1998), within the forests and beekeeping department and later the Tanzania Forest Services. In implementing the policy, several interventions have taken different entry points, piloting governance models, and supporting different actors in the beekeeping industry. But little has been achieved: Most beekeeping cooperatives and associations remained weak, fragmented, with limited capacity and resources (MMA, 2007; Tutuba et al., 2019a) to create value and capture a sizable value for beekeepers. Sizya (2001) argues that inefficiencies in cooperatives are based on the lost faith in their ability to help rural people, beekeepers, in this case, overcome their problems. Therefore, it is difficult to identify what may be termed as the best practice in governing the industry and linking beekeepers to markets (Belgian Technical Cooperation [BTC], 2013; Tutuba et al., 2020). In this regard, it is important to analyse different governance models through which beekeepers can efficiently be organised, managed, and coordinated to deliver value to customers and capture value for both ecosystem actors and the society.

Business Ecosystem

About two decades ago, organizations co-innovated through bilateral agreements and these collaborations could be analysed at the dyad or firm level (Yaghmaie and Vanhaverbeke, 2019). Firms drafted collaboration agreements to exchange skills and assets to co-innovate, and to develop new products. Currently, technology development, changes in consumer behaviour, and access to potential resources have increased the complexity of doing business. Firms like beekeepers with limited skills, asset, and capacity are forced to expand their business activities, and value chain through collaborations. They have to work together with other organizations to receive complimentary assets and skills (Tee and Gawer, 2009), products and components (Teece, 1986; Vanhaverbeke, 2017), and to develop and commercialize innovations. This combination of the value chain and complementary products is called a value network (Amit and Zott, 2001) or an ecosystem (Moore, 1993; Iansiti and Levien, 2004).

Management scholars (Moore, 1993; Adner, 2017; Kapoor, 2018) use the term ecosystem to refer to a set of interacting organizations that depend on each others' activities and resources; and a business ecosystem as a group of interdependent businesses collectively providing value propositions (Amit and Zott, 2001; Osterwalder and Pigneur, 2010) to their customers. In an ecosystem, the fruition relies on the technological and business leadership of firms – also referred to as an industry leader (Moore, 1993), a keystone firm (Iansiti and Levien, 2004), orchestrator (Vanhaverbeke and Cloudt, 2006), an ecosystem captain (Teece, 2016), a platform leader (Gawer and Cusumano, 2014), or a focal actor (Adner, 2017;

Kapoor, 2018) – that organize and govern other actors to provide a value proposition. The key to a business ecosystem is orchestrators who have a strong influence and governance over the co-evolutionary processes. In the beekeeping industry, the orchestrator should influence other firms within the industry; also, firms like beekeepers should influence each other in the co-evolution process to join the ecosystem. Furthermore, scholars emphasize that different analogies (Adner, 2017; Jacobides et al., 2018; Tsujimoto et al., 2018) and formulations (Moore, 1993; Adner and Kapoor, 2010; Leten et al., 2013; Gawer and Cusumano, 2014; Kapoor, 2018) of ecosystems depend on the unit of analysis and the scope of the study. Nevertheless, while the ecosystem perspectives are conceptually distinct, they are mutually consistent, one does not rule out the other as they relate to each other. Therefore, as we focus on governance of the beekeeping business ecosystems we adopt the *ecosystem-as-structure* approach as a unit of analysis (Adner, 2017). In this approach, the orchestrator interacts, engages, and defines the borders with other ecosystem actors to collaboratively deliver on their value proposition, allocate resources, and deal with multiple governance systems, actors, and relationships based on incomplete contracts. The boundaries of the ecosystem are intimately related both to the nature of the value proposition (Vanhaverbeke and Cloudt, 2006) as well as to the structure of interdependencies (Adner, 2007). Therefore, the management of ecosystems rests on the explicit considerations of actors who lie off the critical path to the end consumer (Colombo et al., 2019): we need to consider actors (*who needs to be included?*), structure (*who hands off to whom?*), and governance (*who sets the rules?*). This study discusses the boundaries towards ecosystem governance and unit of analysis within three pillars: participation, structure, and the governance of business ecosystems.

Governance

In recent years, the term *governance* has been used to describe a wide array of situations with different and sometimes contradictory meanings. Many of these descriptions have been linked to specific considerations, where governance is seen either as a process, a structure, a system of values, or an outcome (Turtone et al., 2007; Uludag et al., 2016). For example, in a typical commercial enterprise, usually, the term corporate governance is used to describe the suite of internal and external relationships, roles, responsibilities, and accountabilities that guide interactions between stakeholders, staff and management (Oludag et al., 2016; Teece, 2016). In this study, we define governance as a structure of contractual arrangements (Sanchez and Ricart, 2010) between organizations that confer decision rights regarding *activities* (Teece, 2016) collaborations, policies, and assets like leasing contracts (Cunningham et al., 2017; Colombo et al., 2019) are owned, managed, and controlled. The owned and controlled activity include the incentives to align the goals of the participating organizations and the mechanisms to [governance] manage the difference between different opinions of participants. Teece (2016) argues that the ‘activity’ can range, and therefore can be analysed, at diverse levels: from a transaction (*transactional governance*) to a whole company (*corporate governance*), to a business ecosystem (*ecosystem governance*). This study is limited to the transactional and ecosystem governance, hence we define and analyse governance at transactional and ecosystem-level within the beekeeping industry in Tanzania as described below.

Transaction-Level Governance

The governance of business transactions is grounded in the transaction cost economics theory (Williamson, 1975, 1985; Anin et al., 2016). The issue is how the transaction is most likely to be conducted smoothly so that efficiencies are captured, and disputes can be avoided. A typical example is a make-or-buy decision: The orchestrator in the beekeeping industry should decide to [make] produce honey, or to buy honey from producers, beekeepers in this case. Another example is an invest-or-outsource decision. In this case, the orchestrator should decide when and how to invest or outsource some activities in the beekeeping value chain. When the relationship involves repeated transactions over the long term, the two parties may build up norms, shared structures, relationship capital (Figueiredo and Teece, 1996) to help govern the ongoing relationship. Relational contracting lies somewhere between arm’s-length contracts and full-on integration. This intermediate forms of governance like strategic

alliance began to receive greater attention in the 1990s as such arrangements became more common (Anin et al., 2016). This line of research expanded away from the strict (but bounded) rationality of transaction cost economics to incorporate sociological concepts such as trust (Teece, 2016). In the beekeeping industry, trust is very important in building relational contractual model. If beekeepers will not be trusted to deliver quality honey as per the contractual agreement, the ecosystem will not be sustainable. Similarly, if the orchestrator will not pay beekeepers as per the contract, beekeepers might opt to sell honey to another trader.

Ecosystem [Collaborative] Governance

In addition to determining economic gains and governance, collaboration among value chain participants is important. This is one of the distinguishing features with other traditional business relationships. For example, in transaction-focused governance, transacting parties have no long-term business relationship. The business relationship ends after every transaction (Teece, 2016). For example, in the transaction model, beekeepers are not disturbed about whether honey traders are creating more value for customers or capturing value. But in collaboration [market-focused] governance, value chains are driven primarily by market requirements, basically, by the value proposition. Ecosystem actors work together to efficiently produce and market products to meet the needs of the targeted consumer(s). For example, beekeepers will be aware that if they contaminate honeycombs, processors will not be able to refine and pack quality honey and thus customers will not get a quality product. Accordingly, all value chain actors, will not be able to capture value from a particular customer. But if every actor in the ecosystem will properly play their roles not only existing markets are likely to change, but also new markets can be created with the right products. The role of the orchestrator, in this case, goes beyond the ability to link various partners but to find connections among different partners and encourage them to work directly with one another to identify nascent opportunities (Furr and Shipilov, 2018) and present a new value proposition to the target market.

Business Ecosystem and Governance

After introducing the concept of business ecosystems (Moore, 1993), different concepts, analogies, and constructs of ecosystems have emerged, disrupting the traditional boundaries between organizations and industry sectors. In business perspectives, the ecosystem concept has been tied up around the value creation, firms' growth, and collaboration (Pisano and Teece, 2007; Adner and Kapoor, 2016; Ketonen-Oksi and Valkokari, 2019): beekeeping organizations with different resources, capabilities, and complementary assets interact to bring about value propositions. However, the interactions between these actors within the ecosystems give rise to governance challenges (Cunningham et al., 2017) including distribution of resources, allocation of activities and related costs, and value appropriation. Turton et al., (2007) argue that ecosystem governance is the means for achieving direction, control, and coordination of firms that have varying levels of autonomy to advance the interests and objectives to which they jointly contribute. Ecosystem governance comprises governance structures and activities that try to exert influence or deal with actors and systems in the ecosystem structure (Uludag et al., 2016). Therefore, the business ecosystem governance should be structured around the orchestrator. However, the orchestrator cannot directly govern other participating firms/actors via an ordered or hierarchical power. It has to influence and find a deal through bargaining, negotiation, and compromise. Also, interactions among firms should show some reflection of the organization rather than being random. In this regard, ecosystem actors' interconnections are governed when parameters requiring product, process and logistic qualifications are discussed and agreed upon by all participants. For example, in the honey production chain, beekeepers and the orchestrator should discuss and agree on some parameters like honey quality, grading, and the type of honey to be delivered. Similarly, in the trading chain, the orchestrator and channel members should agree on some parameters like the nature and size of packs, and branding. These parameters have consequences up to and down the value chain including bundles of activities, actors and functions (Teece, 2016; Jacobides et al., 2018). In this regard, it is the coordination, communications, and the allocating roles to ecosystem actors that reflect an important part of the act of governance.

METHODOLOGY AND APPROACH

The study was qualitative action research (Altrichter et al., 2002; Greenbank, 2011; McGrath and O'Toole, 2012). Action research is a family of research methodologies which have “*a collaborative democratic partnership between practitioners and researchers*” (Saunders et al., 2009: 147). The strategy was used to appreciate its strengths (Altrichter et al., 2002; Earl-Slater, 2002 et al., 2009; Yin, 2014). The study was conducted in Tanzania, in regions of Kigoma, Singida, Dodoma, and Iringa, which were purposively selected. The area has considerable beekeeping potential because of available diverse vegetation and ecological zones (Msamula et al., 2018; Tutuba and Vanhaverbeke, 2018). The study population contained different organizations in the beekeeping industry in Tanzania from which 12 firms were purposively selected. Using triangulated data collection techniques (Hair et al., 2007; Yin, 2014), data were collected until saturation. The first technique was an interview: An unstructured interview guide was used with members of the 12 selected sample and later, the observation techniques were used. Saunders et al., (2009) argue that participant observation has been used much less in management and business research. Therefore, by using it in this study provides a valuable empirical ground through which management and business research can rely on the methodology. The motivation and purpose of the study were explained to respondents. Data analysis used the interpretative technique after were recorded in a notebook, voice and video recording, and picture taking was agreed. The findings of the study are presented in the next section.

STUDY FINDINGS

In this section, we present the findings of the study. First, we present the organization of the ecosystem actors in the beekeeping industry, defining both the actors and the structure of the business ecosystem. Secondly, we present the governance of the ecosystem based on the links in the ecosystem organization.

Organization of the Beekeeping Ecosystem in Tanzania Beekeeping Industry

The ecosystem begins with the configuration of activities and actors, the alignment structure of partners that need to interact to present a “focal” value proposition. In the ecosystem-as-structure, the orchestrator set stage for these actors. The findings show that the beekeeping ecosystem is organized by two sets of actors: core or primary actors, and supporting or secondary actors. The *core actors* in its beekeeping ecosystem include suppliers like carpenters, artisans, tailors, and firms selling beekeeping tools; the producer group like beekeepers, and honey hunters; the orchestrator which could be the private firm, cooperation, or a cooperative; honey traders like retail shops, supermarkets, vendors; and customers like households, local brewers, traditional healers, tourists, hotels and restaurants. The *supporting actors* are organizations in an ecosystem which do not directly participate in the value creation and value capture activities. The findings show that the existing governance structure of the beekeeping ecosystem begins with the linkage between suppliers and producers. Honey producers trained local suppliers of beekeeping inputs like carpenters and tailor to manufacture/make standard beekeeping tools. In Kibondo for example, six carpenters are trained by UKI Limited to make standard top-bar hives. Also, in Singida we found that the Singida Youth Entrepreneurs and Consultants Cooperative Society (SYECCoS) trained and own the carpentry workshop to manufacture beehives, smokers, and bee suits. Furthermore, most beekeepers are linked to rural financial schemes like village community bank (VICOBA). The institutions provide financial services to the beekeepers and their associations to finance some beekeeping activities. For example, in Kwelikwiji in Morogoro region, the Umoja beekeeping group borrowed some money from VICOBA to finance their initial 15 box hives to start a beekeeping activity.

The second group of actors in the beekeeping ecosystem is the honey producer – beekeepers and honey hunters. The core activity of the producer group is to produce honey. Most beekeepers do the activity by using local means and tools, have an average of 15 hives, and the occupancy rate is about 48 per cent. Most honey hunters are found in areas which have natural forest reserves. For example, we

found potential honey hunter in Kibondo, and Mvomero in Morogoro. Kibondo honey hunters use the Moyowosi-Kigosi game reserve as their hunting ground and they can collect an average of 200 buckets of comb honey (about 3.3 tons of semi-refined honey) per year. Also, in the year 2018 Nia Moja beekeeping association in Morogoro collected about 15 buckets (400kgs) of semi-refined honey from honey hunting activities in Wami-mbiki river basin. Regarding the links and structures, we found that beekeepers are coordinated and interlinked through cooperative: the cooperative orchestrates the beekeeping ecosystem in a particular area. We observed that most cooperative is limited to the district level and have at least 200 members. In this type of ecosystem, the cooperative is in the middle of the structure linking the production side (beekeeper) and the market through the collection centre. We also found that all the collection centre are owned and operated/run by the cooperatives. Also, the cooperatives manage the aggregation, refining and packaging, and channel management as they present value proposition to target customers.

Governance of the Beekeeping Ecosystem

Beekeeping ecosystems in Tanzania are organized and governed through the cooperatives and community-based organization (CBO) models. All the cooperatives were registered, formalized and operate under the cooperative laws like the Cooperative Societies Act of 2013, available in Tanzania. Also, about 95 per cent of all the CBOs were registered at district level: They have a written and registered constitution, certificate of registration, defined number of members and leadership structure, and at least one bank account. At the cooperative model, the ecosystem is organized through the collection centre which is owned and operated by the cooperative. We also observed that most collection centres were built by either development partners through beekeeping projects or by government agencies. For example, collection centre of Mwakila and UKI cooperatives were built through the support from development partners. This suggests the importance of including secondary actors in the beekeeping ecosystem as they can support the ecosystem with complementary assets and skills which primary actors would not have acquired or accessed. For example, beekeepers take portion in owning the collection centre through the cooperative. Another advantage is the inclusion of beekeepers in the management, leadership, and operational activities of the association. All ecosystem actors should make sure that the constitution, rules and regulations have adhered.

Regarding the governance of the beekeeping cooperatives, we found that most cooperatives are not efficiently operating their collection centre because they have continuous stockouts of honey, they don't have enough funds to run the facility, and they delay to make some decisions. Most cooperatives frequently run out of stock of honey because either member are not depositing honey or there is not enough honey to bring to the collection house. For example, Mwakila cooperative in Kigoma had stockouts because beekeepers were selling honey to local traders instead of depositing to the collection house. The reason for such action is the delay by the cooperative to pay beekeepers when they deposit honey. The cooperative delay to pay honey depositors because they don't have working capital or money. Additionally, the cooperative run out of honey because they cannot buy honey from non-member beekeepers: cooperatives don't have instant cash to pay to beekeepers, and the constitution and operating procedures of the cooperative do not allow such transaction. Regarding delays in decision making, we found that most cooperatives are not organizing annual meetings. For example, some machine from UKI cooperative is not working since 2016 because they need some repair and maintenance. The decision to repair and to buy spare parts have to come from the board. Neither the board meeting nor the general meeting has been convened since 2015. Therefore, a different governance model is necessary to improve efficiency and value creation in the sector.

DISCUSSION OF THE FINDINGS

This section presents the discussion of the study analyzing the governance structure of the beekeeping ecosystem in the beekeeping industry in Tanzania.

The Structuralist Approach to the Business Ecosystem

In a business ecosystem, different organizations choose to work together to produce and market products in an efficient manner to meet the needs of the targeted consumer(s) in the target market segment. This does not happen automatically but through the appropriate governance structure. The governance structure ensures that interactions between firms in an ecosystem exhibit some reflection of the organization rather than being random. The structural change of the IA changes both the process of creating value by changing the roles of actors and the model of appropriating value. In the transaction model, beekeepers performed all the activities, but in the ecosystem, they will only do the production. Beekeepers have to deposit honey to the collection house after harvesting. Furthermore, in the ecosystem governance, the number of actors in the value chain can be reduced by combining some activities. For example, beekeepers handle honey to an orchestrator who performs the rest of the activities. This approach will increase the size of the pie by reducing costs and improving efficiency and quality of honey. Furthermore, the business model of beekeepers will change because they have to align their business model with that of the orchestrator. The value proposition changes to the focal value of the ecosystem, all actors create value together. The customer segment of beekeepers becomes the orchestrator, and customer relationship changes from transaction-based to collaborative. Key activities of beekeepers change from doing all the value chain activities to production activities. Also, Key resources are limited to production only, and key partnerships are established. The revenue stream comes from selling refined honey: Beekeepers are paid for the amount of refined honey extracted from their deposit at the agreed price.

Structural Governance of the Beekeeping Ecosystem

Regarding the structure, the ecosystem is structured around the collection centre (CC). The structure of operating the CC determines the governance model of the ecosystem. The CC can be owned and operated by either a cooperative, hence cooperative centric governance, or the private company, hence corporate centric governance. When the CC is owned and operated by a private company, the ecosystem becomes purely a trader-based business model (Tutuba et al., 2019b; Tutuba et al., 2020), and the business relationship between beekeepers and trader is mostly arm's-length and competitive. Also, the IA can take different forms like a tripartite model, and contract farming model (Tutuba et al., 2019a) which poses a risk to compete to share the pie instead of focusing to increase the size of the pie. Conversely, if the CC is owned and operated by the cooperative the ecosystem gains some advantages in terms of both value creation and value appropriation for beekeepers. First, beekeepers gain control and access to other activities through the CC, hence they create more value which they could not have created by working outside the cooperative. Secondly, beekeepers gain bargaining power through aggregation, and quality improvements. Lastly, the cooperative provides easy access to business support services: A cooperative is a mouthpiece, an address, and a patron that can be used as a guarantor to beekeepers. Therefore, through a cooperative, beekeepers can easily be spotted, identified/recognized, and supported. Despite these benefits, the beekeeping cooperative face some challenges in orchestrating the ecosystem in the beekeeping industry in Tanzania. Most beekeeping cooperatives are not efficient, and beekeepers are reluctant to join the cooperatives. This finding confirms the observation from MMA (2007) who argue that *"beekeepers are generally not yet well organized. The organizational model developed around cooperative society collapsed and left bad image of beekeepers organization"* (p.54). The ecosystem should be organized such that beekeepers can bulk their produce and transact effectively with other chain actors as well as with the service providers. The model, "adaptive ecosystem" (Furr and Shipilov, 2018) or *hybrid model*, should aim at increasing value appropriation by reducing transaction costs and competition.

Changing the Industry Architecture Through the Hybrid Business Model

Both private-centric and cooperative-centric model is observed to be a kind of centralized ecosystems which results into an arm's-length transactions that keep partners separate from one another, the hybrid or adaptive ecosystems are structured to encourage interlinkage between actors. In the beekeeping industry

in Tanzania, the hybrid model is an ecosystem model where the collection house is owned by the beekeeping cooperative but operated by the private company. The hybrid ecosystem model comprises of beekeepers, cooperative, corporation (orchestrator), retailers, and consumers as primary actors; and a set of secondary actors from different sectors. The structure of the hybrid model is suggested. In the hybrid model, all actors converge to the CC, and its governance depends on the relation [interlinkage] between the actors.

The hybrid ecosystem starts with the input supply and business support activities. These activities are performed by different actors interested in the development of the beekeeping industry. The second activity is honey production. This activity is performed by the producer group, most beekeepers. Their main roles include producing/collect honey from bee colonies, bulking, and deposit honey to the collection centre. In the ecosystem, beekeepers have three major links: the link to suppliers, the CC, and the cooperative. The link to suppliers helps them acquire beekeeping inputs, and the link to the collection centre provides access to the reliable market by depositing their produce as soon as they harvest. In this case, beekeepers do not have to worry about the market as long as the produces to meet the agreed standards, procedures, and regulations. Also, the link to the cooperative guarantees the protection of beekeeper's interest in the beekeeping industry. The cooperative link beekeepers with other actors to access complementary assets and skills. The beekeeping cooperative is the third actor in the hybrid ecosystem governance model. The cooperative perform the linkage role to beekeepers, suppliers and business support organizations, and the orchestrator. The orchestrator can only reach or make a deal with beekeepers through a cooperative. Also, other actors like suppliers, financial institutions, and BSPs/BDOs can reach, support, and make deal with beekeepers through their cooperatives. The cooperative protect the interest of beekeepers in the ecosystem and observe legal/regulatory issues for the interest of beekeepers. Also, it ensures that beekeepers are fairly/smoothly paid: The beekeeper deposit honey (e.g., a 20kgs bucket), the cooperative representative and the orchestrator verify and grade the deposit, then the orchestrator pay (Tshs 140,000) to the cooperative, and the cooperative pay the beekeeper (e.g., 133,000) after deducting all necessary and agreed charges (e.g., 5% of sales as a collection centre fee – Tshs. 7,000). On commercial terms, beekeepers will immediately, at least within 2 days after deposit, collect their money from the cooperative. The income of the cooperative is generated from three sources: rent of the CC, monthly subscription fee of members, and sales fee of honey in the collection centre. All fees, charges, and rent should be decided by the cooperative board and approved by members in the annual general meeting.

The second cooperative link is the link with the orchestrator. In this model, the collection house is owned by the beekeeping cooperative; it is the property of the cooperative. But, the machines and working tools are owned by the orchestrator, the private company, also the operational activities of the collection centre are managed by the company. The company pay rent to the cooperative based on the agreement set by the board or general meeting of the cooperative. Therefore, the collection centre is the meeting point of beekeepers, cooperative, and orchestrator. The role of the cooperative in this case is to make sure that the building and its infrastructures are in good condition to enhance the smooth operation of the collection centre. For example, the cooperative has to make sure that the collection centre meets the required standard to process honey and is registered by the respective authorities like TFDA and TBS. Also, the cooperative has the role to make sure that all beekeeper-members sell their honey through the collection centre only; no side selling or violation of the transaction and operation agreement. Beekeepers deposit honey in the collection centre, honey is checked by both cooperative representative and orchestrator employee. All parties – the beekeeper, cooperative, and orchestrator – check/inspect for quality of honey, volume, and other agreed parameters like water content. They should record/document and sign the documents. The document can be customized depending on the information that they want to capture. However, some basic information like name and address [identity] of the depositor, type/category (comb or semi-refined), grade, quantity, and value/price should [is important to] be captured. After signing, every part should take a copy of the document for further references. This documentation is important as it clears all doubts, complaints, and fraud that may arise concerning quality, quantity, and later payments. For example, the experience with most beekeepers is that they have faced some fraud,

misconduct, and distrust when they deposit honey. As a result, most beekeepers lost confidence and trust to operate through cooperatives and collection centres. After signing the documents, honey is officially received in the collection and legally changed both possession and ownership from a beekeeper (through a cooperative) to the orchestrator. In this regard, the role of a beekeeper and a cooperative in handling honey ends at this point. Thereafter, the cooperative has the role to claim or follow-up for payments from the orchestrator and make sure that the depositor [beekeeper] is paid: The orchestrator pay the respective amount of money to the cooperative which pays the beekeeper accordingly. The monetary transactions can easily and smoothly be done through mobile banking or internet banking. Furthermore, the cooperative has the role of making sure that the orchestrator gets enough honey to run/operate the collection house commercially. If beekeepers cannot bring in the collection house enough amount of honey, the orchestrator should be allowed to buy or bring in honey from non-cooperative member beekeepers. This agreement or arrangement is important to keep the centre operational and profitable. The observation from Kigoma and UKI cooperatives show that the collection centres were shut down because beekeepers could not feed them. But they were also not allowed to bring in honey from beekeepers who were not cooperative members. This practice makes the centre less efficient and non-commercial. They frequently run out of stock and therefore not reliable sources of honey products. The cooperative, therefore, has to make sure that beekeepers are productive enough to feed the collection house with quality and standard honey product. It is also the obligation of the cooperative to decide, of course, after discussing with the beekeeper, what to do with honey rejects, if any.

Orchestrator is the next important link in the ecosystem. This is the commercial firm or company which oversees all commercial operations of the ecosystem. The orchestrator has two important links: the link to the production side through the collection centre and the link to the market. In the collection centre, the orchestrator is linked to both the cooperative and beekeepers: the orchestrator is the buyer of all honey deposited by beekeepers in the collection centre and it manages all activities in the collection centre. The efficiency of the beekeeping ecosystem is improved when the orchestrator owns machines and working tools as well as managing the operational activities of the collection house. The experience with the collection centres which are owned by cooperatives is that there are some inefficiencies due to delay in decision making, bureaucracy in procuring stuff like spare parts, and services like repair and maintenance. For example, if there is a machine breakdown, the decision to repair takes time because it should pass through some decision hierarchies. Therefore, this challenge is reduced when the governance and the operational activities of the collection centre are performed by the orchestrator which is a private commercial company.

The last but equally important actor in the ecosystem is the customer. All the activities, arrangements or positioning and interlinkage of actors aim to present the value proposition to target customers in the market. In the beekeeping industry in Tanzania, potential customers are individual households, tourists, and hotels and restaurants in the urban market. The value created should be delivered to target customers in urban markets and revenues should be captured. So, the orchestrator is linked with customers through both direct and indirect channels to deliver value, and he should decide on the model how customers will pay. The observation in the beekeeping industry in Tanzania is that most customers prefer cash on delivery, and they pay via digital systems or M-Money like M-Pesa and Tigo-Pesa.

Following this discussion and re-arrangement of the beekeeping IA the ecosystem and its governance model is structured/formulated around the collection centre to perform the aggregation, commercialization, and linkage roles. Depending on how the collection centre is owned and managed, honey is received from depositors (beekeepers), checks for quality, traceability, and does the grading. The centre manages deposits, keeps records, maintains safety, and find markets. Also, it is a link between producers (beekeepers) and buyers or private sector organizations. A well-structured collection centre creates a good link such that products are easily sold and at a good price. However, developing an appropriate commercial structure is a challenge, particularly in establishing the cost structures. It is quite evident that few actors, mainly the main private sector companies and traders, often set the rules of the game. In most cases, they do so to promote their interests. Given weak organization at the producer level presumably, they are not much involved in the governance of the chain. The policy and guidelines are not

yet enforced by the government which leaves the sector at the mercy of some greedy actors. There are no written contractual obligations, which could have been used to spell out the roles and responsibilities of different parties. It was noted that some producers are so sceptical of contractual obligations due to the failure of cooperative society and would rather develop spot transactional relationships (cash on delivery) with buyers. Most beekeepers do consider that contracts work against them by tying them into one buyer. This is a move against long term business relationship building which is crucial. The strength of the model, however, is built on its ability to manage the revenue streams. With well-defined activities of the centre: value proposition, customer segments, channels, and relationships can also be well managed. To achieve this, a well-structured partnership model, also called "hybrid model", between a cooperative and commercial company is necessary. Also, beekeepers are still a rather silent player, yet they are expected to be the main base for the channels in terms of the production function. In this model, the cooperative owns the CC and focuses on the productivity of honey production among members. The beekeepers sell honey to the company at a predetermined price, somewhat higher than the market price, and are paid after quality control. The orchestrator should also reject honey if too hydrated, adulterated or over smoked. The company rents the collection house from the cooperative owns the installation machines, purchases, purifies and package honey. Thus, all operations in the collection house, and channel management or root to market are done by the company, not by the beekeepers or the cooperative. Part of the revenues goes back to the cooperative to finance cooperative activities and operations like buying beehives and bee suits. The cooperative has, in turn, the obligation to provide a sizable volume of honey per year to supply the company: the company can buy honey elsewhere if supply falls short. Beekeepers should be able to buy packaged honey from the company and sell under specific conditions.

CONCLUSION

The existing arm's – length transactions within the beekeeping industry and their governance structures are not commercializing the beekeeping activities in emerging markets. Firms with limited skills and capacity to compete should team up with other firms with complementary assets and skills through a business ecosystem model. Changing the business structure requires beekeeping firms to change their business models as well as governance models. In the beekeeping industry, we argue that different forms of governance are present in the emerging value chains. But for the beekeeping ecosystem to create value, participating firms should be structured through the collection centre through. All ecosystem actors should be governed to deliver the focal value proposition: quality, unadulterated, and branded honey.

Theoretically, the study findings and discussion focused on aligning actors and governing an ecosystem so that participating actors can collaboratively present a value proposition to target customers and appropriate revenue from the activity. This finding is aligned with a theoretical overview of the ecosystem that the performance of the ecosystem is determined by the interaction between actors (Adner and Kapoor, 2016), governing the ecosystem around focal value proposition (Teece, 2016; Adner, 2017; Tutuba et al., (2020)), and building an adaptive ecosystem rather a centralized ecosystem (Furr and Shipilov, 2018). To govern an ecosystem, the orchestrator has to structure and manage the ecosystem so that the potential of the ecosystem to create joint value is maximized. Also, there should be trust and mutual agreements with other participants to share this joint value created equitably. Therefore, the orchestrator focuses on complementarities that arise as a result of asset and activity specificity, which itself is a managerial choice, requiring the appropriate governance choices to protect against lack of collaborative and interlinkage behaviours in the ecosystem. As such, complementarity that arises because of asset specificity makes integration attractive and hence the orchestrator focuses on unique complementarity in production, processing, and channel management so that actors can efficiently be aligned to deliver the joint value proposition to customers in urban markets.

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