# Knowledge Management in Sustainable Supply Chains in a Developing Field: Case Natural Products

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Abstract: Collaboration networks allow different actors inside the industry to exchange knowledge. The knowledge exchange plays an important role in innovation and industry development. Companies join collaboration networks to gain competitive advantages and to gather knowledge from other network members. Acquired knowledge can support innovation without requiring additional investments from the companies. The Finnish natural product sector is an immature industry field where the knowledge exchange inside the collaboration networks is not identified. The study identifies and presents the different collaboration between the actors is common and there are both formal and informal networks where the knowledge is exchanged. However, informal networks are more popular, and the exchanged knowledge is mostly in a tacit format. This reflects the underdevelopment of the sectors, characterized by the informality of its network and the reliance on tacit knowledge.

# **1 INTRODUCTION**

Knowledge management plays an important role in organizations when trying to achieve competitive advantages over other companies. It is especially important in the developing field where companies do not have a lot of resources to innovate and develop their companies. Developing field companies need this information to successfully expand business to new market areas and succeed in more competitive global markets (Tubigi & Alshawi, 2015). Needed knowledge can be reached through collaboration networks.

Knowledge management and networking can be researched with many different approaches. This is due to the wide scale of different definitions for knowledge management (Amine Chatti, 2012). This study will approach knowledge management from knowledge creation, exchange, and utilization inside collaboration networks. Focus has been selected to give a clear picture of the current situation in the immature industry sector.

The Finnish forestry industry is going through a structural change. (Lipiäinen & Vakkilainen, 2021) Timber has been the main product of the Finnish forestry industry. Timber management has developed

in the last three centuries but the natural product industry development is still limited (Sheppard et al., 2020). Nowadays when the forestry industry needs to make swift for more ecological matters the need for additional business opportunities from forests is important. Integrating natural products into the forestry industry could create more complete management of the ecosystems of forests (Sheppard et al., 2020). This would create more new business sustainable business opportunities for Finnish forestry.

Past research has identified that there is a lack of researched information on the natural product sector (Vaara & Miina, 2014). This study aims to fill that gap by identifying how knowledge is exchanged and managed in collaboration networks inside the natural product sector in Finland. The goal is to identify collaboration networks inside the industry and illustrate the types of exchanged knowledge. At the same time, different knowledge exchange channel will be identified inside the natural product sector. Identifying the knowledge management inside these networks can help the industry optimize networks to overcome problems with low levels of networking inside the sector (Vaara & Miina, 2014).

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# 2 THEORETICAL BACKGROUND

Although knowledge management has been recognized as an important part of business for years there has been no widely agreed definition for the term (Amine Chatti, 2012; Fakhar Manesh et al., 2021). It can be defined through the different processes it contains. Knowledge management can be defined as the process of creating, storing, accessing, and disseminating the organization's intellectual resources (Antunes & Pinheiro, 2020). Knowledge management is visible inside organizations trough processes. These processes are for example creating, disseminating, and using the shared knowledge (Bhatt, 2001; Shehzad et al., 2024).

Knowledge itself can be divided into two subgroups that are explicit or tacit knowledge (Nonaka, 1994). The difference between these subgroups is the formality of the knowledge. Explicit knowledge is seen as formal, and it can be transmitted by systematic language. Tacit knowledge is gathered from specific actions and is difficult to formalize and communicate further (Nonaka, 1994). This knowledge can be learned from trial and error and it occurs over time (Gardeazabal et al., 2023). Tacit knowledge is highly person-specific which makes it difficult to transfer (Sita Nirmala Kumaraswamy & Chitale, 2012).

Knowledge creation is proposed to be an endless cycle where organizations gather knowledge through socialization, externalization, combination, and internalization (Gardeazabal et al.. 2023; Schniederjans et al., 2020). Socialization is the way when actors use face-to-face communication to pass the acquired tacit knowledge. Externalization needs individuals with tacit knowledge to allow transforming that knowledge into explicit format. A combination of knowledge is practiced when already captured explicit knowledge is reformed and added with other explicit knowledge to create new explicit knowledge. Internationalization turns explicit knowledge back to tacit knowledge. This happens through internalizing explicit knowledge into a person's own mental models and know-how. (Amine Chatti, 2012)

Dissemination of knowledge is defined as a transfer of knowledge to a focused group (Al Koliby et al., 2022). Knowledge exchange through dissemination can happen inside the organization or between other actors (Huggins et al., 2012). Knowledge dissemination plays an important role when creating new innovations (Castaneda & Cuellar, 2020). Innovation ideas are often created through

using old knowledge that is recombined (Gusenbauer et al., 2023). It also provides the needed security for actors to make informed decisions in fast-changing business environments. Dissemination of knowledge can be difficult. All actors do not have naturally the expertise to knowledge flow. It needs clear practices and channels to work properly. Dissemination channels vary from traditional written channels to new modern digital channels. Written channels include books, reports, research, and other written sources. Digital channels include DVDs, emails, websites, and other internet sources. The last dissemination channel is interpersonal communication. This can happen in different kinds of events such as seminars, forums, and workshops. (Lafrenière et al., 2013)

Companies must use the knowledge gathered to achieve benefits out of it. This process of knowledge management is defined as the usage of gathered knowledge. This can be also referred to as the utilization of knowledge. Knowledge exchange itself does not create much additional value for companies. The knowledge must be used to gain competitive advantages from it. (Ouakouak & Ouedraogo, 2019) Utilization of knowledge has been seen as a critical process for turning knowledge into an effect on an organization's performance. Utilization is the process of knowledge management that has the biggest effect on overall performance. (Zaim et al., 2019)

Knowledge management can be also seen as an important practice when pursuing sustainably. Knowledge management is a strategic resource for companies of every size that can obtain sustainable practices through different knowledge management processes. (Chopra et al., 2021)

# 2.1 Collaboration Networks

Companies have multiple drivers for joining collaboration networks. Collaboration with other actors has been identified as beneficial for the companies. Identified benefits include cost reduction, economies of scale in production, lack of own resources, increased flexibility, access to new markets, and increased visibility (Tenhunen, 2006). On top of these benefits networking with other companies can perform better knowledge exchange and acceleration of innovations through networks (Lin & Lin, 2016). Knowledge can be acquired in various ways. For small companies, one way is through networking (Huggins et al., 2012). Networking enables small companies to use knowledge from other companies inside the network without their own resource investments (Puthusserry et al., 2020).

Nowadays innovations are not happening only inside individual companies (Möller et al., 2009). Instead, more and more innovation occurs inside networks of organizations. Collaboration allows companies to gather information from a larger knowledge pool for innovation (Mu et al., 2008). For knowledge exchange, this means that knowledge should flow easily between different actors inside the network. Without the knowledge sharing between the actor the benefits of collaboration for innovation cannot be guaranteed (Wang & Hu, 2020). These collaboration networks that allow knowledge flow can be categorized by the formality of relationships between different actors. The different kinds of networks are formal and informal networks(Ken G Smith et al., 1995).

Formal networks can be defined as networks where different actors have well-structured connections between them. These connections can be confirmed for example with contracts or other formal agreements that will specify how the cooperation is done (Ken G Smith et al., 1995). Typically contracts will create either an exchange or strategic link between the networked companies (Vesalainen, 2007).

The second type of network are informal networks. In these networks, the connections between different actors are defined by the personal relationships of company representatives (Ken G Smith et al., 1995). These relationships are based on previous cooperation and friendships of the actors (Vesalainen, 2007).

Social relationships between networked companies have their own value to the companies and the term social capital is used to describe that. Social capital is defined as social connections that will help the communication between the different members of the network and that way create competitive advantages against other companies outside the network (Mu et al., 2008). Social capital has been seen as the foundation for networking (Al-Omoush et al., 2022). Social capital is playing a major role in the information exchange between companies (Gölgeci & Kuivalainen, 2020; Yeşil & Doğan, 2019). Social activity between organizations is seen as a boost for knowledge transfer. This is because trust is needed to share and accept knowledge openly (Li et al., 2015).

# 2.2 Natural Product Sector

The definition of natural products and the different terms linked to them varies in the literature (Ahenkan & Boon, 2011; Smith-Hall & Chamberlain, 2023). The two other commonly used terms to define natural products that are growing wild in nature are "Nontimber forest products" and "Non-wood forest products (Muir et al., 2020). The definition of these terms varies between countries and there is no widely accepted consensus on the term (Ahenkan & Boon, 2011; Smith-Hall & Chamberlain, 2023). In this research natural products are defined as wild and semi-natural plants or mushrooms used as such or for processing. In addition to plants and mushrooms, natural products also include various products derived from trees, such as sap, resin, spruce bark, leaves, bark, and conifers (Rutanen et al., 2023). This definition is commonly used in the Finnish natural product sector and fits this research case.

The natural product sector characteristics must be considered when investigating the knowledge exchange networks. Most of the companies in the sector are small and micro-sized companies. Companies are heterogeneous and have businesses in multiple industries (Wacklin, 2021). The small size of companies limits the resources companies can use for of the the development supply chain. Underdevelopment of the industry is also seen from the gaps in knowledge inside the industry. There are gaps in harvest-, revenue-, and trade figures on regional, national, and international levels (Sheppard et al., 2020).

Underdevelopment of the industry is affecting the supply of natural products inside Finnish markets. Only 10% of natural berries are picked up yearly and most of them do not end up for industry or sale (Salo, 2015). For example, most of the natural berries picked up every year end up for people's own usage. Only 41% of picked berries end up in the whole or direct sales of natural berries. Same time the availability of natural products has been seen as one of the bottlenecks of the whole industry (Salo, 2015). A lack of knowledge prevents new companies from entering the industry which limits the supply of natural products. Companies do not have the knowledge to start new companies that could provide more capacity for the supply of natural products. Lack of knowledge also limits the supply of natural products because companies do not have enough knowledge and information to anticipate the demand (Vaara & Miina, 2014).

International and national literature suggests that information is exchanged inside informal connections between the different partners inside the natural product sector. Previous studies suggest that inside these networks the unformal knowledge exchange is an important part (Chang et al., 2023; Kämäräinen et al., 2014). Chang et al., (2023) suggest in their research of the Canadian natural product sector that the most important channel for knowledge is other companies in the same field. The same knowledge exchange has been identified in the Finnish agriculture sector where networking and information exchange is common (Kämäräinen et al., 2014).

# **3** RESEARCH DESIGN

# 3.1 Research Methods

The research follows a two-fold approach. Research has the basic approach of conceptually integrating various theories into synthesis. The theory of knowledge management and exchange is considered in the context of the Finnish natural products sector and collaboration networks. The theoretical synthesis is created based on secondary data. This data is collected from Google Scholar, SCOPUS, and LUT-Primo databases. Google Scholar database is used especially for gathering articles on natural products in Finland. Other databases were used to confirm the scientific nature of articles and collect articles about common theories.

The conceptual theory is tested with a critical single case study (Flyvbjerg, 2011). The non-causal goal of the case study is to understand how knowledge is exchanged inside the natural product sector in Finland. Case study data was collected from different companies in the Kymenlaakso region of Finland. The data were collected through semistructured interviews. Interview questions were selected based on the theoretical background (Voss, 2010). Interview questions were tested and confirmed to be appropriate for the research by test interviews conducted with experts in the natural product industry. Interviews were conducted by telephone and Microsoft Teams. Interviews were recorded and littered. Littered material was coded and analyzed to gather needed information for this research.

Companies were selected to represent a wide selection of different actors inside the supply chain by information-oriented selection (Flyvbjerg, 2011). Companies have different focused areas from production, sales, and processing. On top of that informant companies have long experience with natural products. The quality of the data was confirmed by collecting the data systematically with similar interview situations from all the different actors (Mays & Pope, 2000). Research informant companies are represented in Table 1.

Actor	Relationship to natural	Working
	products	experience in
		natural products
1	Picking, Processing,	13 years
	retail sale	-
2	Processing, retail sale	6 years
3	Processing, retail sale	34 years
4	Processing, retail sale	30 years
5	Retail sale	57 years
6	Picking, processing, retail	9 years
	sale	
7	Processing, retail sale,	35 years
	picking	

Table 1: Research actor informants.

To gather more overall information on the sector and confirm data collected from actors, four experts in the field were interviewed. Experts were selected based on their experience in the natural products sector field nationally and regionally. Data was gathered from experts with informal conversations and semi-structured interviews which both were recorded and analyzed. Interview questions were selected based on the literature review. The questions were specifically about information exchange inside the networks. Expert informants are represented in Table 2.

Table 2: Expert informants.

Exp.	Organizational	Relation to	Experience
1	role and field	natural	in
		products	natural
		1	products
1	Field expert/	Expert/	13 years
	Coordinator	developer	2
		-	
	Business		
	development		
2	Processing,	Expert/	6 years
	retail sale	developer	
	-		
	Education		
3	Training	Expert/	34 years
	manager	training	
	-		
	Association		
	(natural		
	products)		
4	Secretary	Knowledge	30 years
	-	dissemination	
	Association		
	(natural		
	products)		

# 3.2 Research Process

The research was conducted in a five-step process. Process parts followed each other and provided a systematic approach to the research subject. The research started with a preliminary literature review which directed to focus and the research gap of this study. The five steps of research were:

- 1. Preliminary literature review
- 2. Research gap definition
- 3. Integrated literature review
- 4. Data collection and analysis
- 5. Theoretical synthesis and validation

The research started with a preliminary literature review. This step of research made the topic familiar and worked as an introduction to the topic. During this step, the keywords and most important references were identified. Keywords that were identified are: Knowledge management, collaboration, collaboration networks, and non-wood forest products.

A preliminary literature review was followed by a research gap definition. In this part of the research, the focus of the research was defined. The definition was made based on gaps observed in the preliminary literature review. The founded gap presents the knowledge exchange in developing the natural product sector.

Based on the defined research gap the integrated literature review was conducted. In this part, the most suitable articles in the context of natural products were integrated into the research. This created the theoretical background of the research.

An integrated literature review was followed by data acquisition and analysis. Based on the literature review the empirical case for research was identified. Empirical case study data was collected through semi-structured interviews which questions and informant companies were decided based on the theoretical background. Interviews were recorded, littered, and coded.

Coded data were analyzed, and similar observations of informants were gathered. The existing actors in the network were typed and grouped to better understand the network as a whole and the role of the different groups (Hakanen et al., 2007). In addition, the boundaries of the network were defined (Monaghan et al., 2017). In this work, the network has been limited to the actors operating in the natural products sector in the region of Kymenlaakso. Based on that the network collaboration and knowledge transfer between the different actors were identified.

# **4 RESULTS AND DISCUSSION**

Collaboration is an important part when knowledge is exchanged between different actors inside the networks. From the interviews conducted for companies, the different collaborations and knowledge exchange inside networks were identified. The collaboration networks can be divided into formal and informal categories based on the theoretical background.

## 4.1 Formal Collaboration

Formal partnerships are based on the exchange of various natural products, either between operators or from operators to customers. In terms of product exchange, three of the operators had formal agreements in place to organize the sale and role of the products. Role-playing and bartering operate both between the different stages of the supply chain and within the same stage of the supply chain. There is contractual protection of bartering between the different roles in the supply chain when buying natural products as raw materials from the larger players in the sector. Sellers at the same stage of the supply chain enter contracts to sell other products in their own shops and on the common market. This is exemplified by the various markets and sales at these markets. Before entering the market, agreements are concluded between the actors. In this way, firms selling different products can correctly distribute the profits from the market between the actors. In addition, the different business models and tax rates of different operators require these agreements to be maintained. Contract details about quantities and quality is exchanged with digital channels like email and telephone.

In addition to formal cooperation based on exchange, small-scale strategic cooperation was also identifiable in the sector. Strategic cooperation was for example, by selling the products of another network member in their own shop. In addition, one of the operators interviewed had created joint marketing material with another company. The aim of these activities was to grow the business of both companies together. Despite the formal agreements between the actors, the base for these collaborations is still between the companies' relationships. Actors have made often informal collaborations between actors before transforming it to a more formal format.

Despite the formality of the collaboration network the knowledge creation and exchange is mostly informal. Knowledge is tacit that actors have gained from their own experiences. This knowledge is shared interpersonally face-to-face in different kinds of situations when formal partners meet each other. Interviewees stated that they exchange knowledge with their formal partners to help them survive better on the market. This knowledge is tacit and only in the actors' own knowledge base.

Formal explicit knowledge exchange occurs when actors are in collaboration with the associations of the natural product sector. These collaboration relationships are formal and need registration from the actors. The association disseminates the explicit information about the industry to the actors. Associations use mainly digital channels like email and websites for explicit knowledge dissemination.

# 4.2 Informal Collaboration

In addition to formal cooperative relationships, some relationships operate informally on the basis of trust. For example, some of the natural berries are sourced between companies purely on the basis of trust. In an example situation, the picker knows when to bring the berry to the marketplace, and through this the berry retail sellers buy it. The purchase volumes are not agreed in advance by contract but take place on an asneeded basis. The same applies to the sale of other natural products. The interviews showed that other natural products are also bought without prior agreements. These trade cooperation and relationships are based on trust built up over a long period of time and knowledge of who has what to offer which product. Companies operating in the sector know what others have to offer and therefore know where to get the products they need. This ensures that actor is receiving natural products in desired quality. The quality of products is really important for the actors.

The exchange of information between companies is mainly done using traditional information exchange systems. These channels include face-toface conversations, telephone, and e-mail. Information and advice on the sector are provided face-to-face and by telephone. By telephone, operators contact well-known actors who have been active in the sector for a long time to get advice for working inside the industry. Long-established actors play an important role in the networks by passing on knowledge to newcomers. They have created the knowledge based their own experience and trial an error action. Face-to-face discussions take place alongside various events. These include events, fairs, and markets. Market traders involved in the sale of natural products to consumers share knowledge with each other by holding discussions with other traders

on the edge of the market. In addition to the traditional means of information exchange, informal networks have their own private closed WhatsApp groups through which information is shared within the network. These closed communities discuss, for example, where to find different natural products in the area. Closed networks are difficult to get into and information does not flow freely to other actors in the sector. Inside these closed networks happens the knowledge transformation to explicit format. Actors with knowledge will write it down to other actors inside these groups and that way make it more easily transformable.

With long-standing partnerships, operators know exactly what services and products each offers. This makes it easier, for example, to organize different kinds of experience services, knowing where to get what kind of service. Here, too, trust plays an important role. It is important for operators to be able to get the service they need, even if they are not in active contact with each other. This is also the basis for selecting those partner companies that really want to cooperate. In general, with the exception of one operator, collaboration was perceived as very important. The importance of collaboration is also reflected in the attitudes of operators towards companies that do not cooperate. Three of the operators mentioned how operators who do not want to cooperate easily end up as outsiders in the sector. The natural products sector is particularly small in the Kymenlaakso region, so a partner who is perceived as difficult to work with is easily excluded from the network of the whole region. For example, those who are negative towards cooperation were considered impossible to cooperate with and were therefore excluded from both formal and informal collaboration networks. Long relationships operate as a promise of quality for actors. Actors want to maintain product quality. This helps to build brand value as sustainable, clean, and high-quality natural products. Actors' states that the brand image of products is concerned when new collaboration relationships are agreed upon.

# 4.3 Expanding the Collaboration Networks

As we have seen from the current state of networks, cooperation, and networking are common in the natural products sector. Despite their prevalence, the organization between actors is still rather informal. This informality may hinder the development of the sector, as it creates uncertainty, for example actors' states that the availability of different natural products can be uncertain. All the operators interviewed were positive about extending networking. This positive attitude is likely to be influenced by the positive attitude towards cooperation that has been noted previously. The positive attitude of the actors towards cooperation will enable the expansion of networks and more formal structures in the future.

During the interviews, the actors were asked what kind of activity would be appropriate as the network expanded. Five interviewees mentioned contracts as the best way, if possible. Two operators could not comment on how expansion could be agreed. Operators were also asked about their interest in setting up a cooperative around the natural products sector. However, this received the most negative response. None of the actors saw a cooperative as a good option for expanding the network. One operator saw a cooperative as a potentially viable solution for the collection of natural products but not for a wider activity. Other operators were even more critical and did not see any use for it.

However, formalism is not to the liking of all actors in the sector. One actor states that contracts to be too burdensome. The contracts are perceived as too burdensome, especially for small operators, and as a result, they do not want to be bound by them. In particular, the excessive costs incurred through contracts are seen as an obstacle to the expansion of cooperation in small businesses. This problem has also been identified by experts in the field. In their interviews, they mentioned how it has been a challenge to get companies to join natural product association networks. The associations in the sector have tried to create various schemes and networks through which, for example, collectors could meet businesses in need of natural products. Despite these networks, businesses have not adopted them in the desired way, which has hampered the development of the natural products sector. The lack of networks has prevented businesses from obtaining the natural products they need, as there is no time to collect them after late notification.

### 4.4 Knowledge Exchange Bottlenecks

Knowledge is tacit and shared informally face-to-face in different kinds of situations. Interviewees stated that these conversations are done in both formal and informal events. Actors meet their collaboration partners inside formally organized events such as market sales and seminars, but the knowledge is mostly transferred informally face-to-face. The tacit knowledge of actors is acquired through years of experience. The informal knowledge piles up for a couple of main actors of the network. Interviewees stated that they have some connection to actors with a long career in the sector. This will make it difficult for anybody outside the ongoing networks to join. The piled-up knowledge is also problematic for the continuity of knowledge. Knowledge acquired by these long-career actors might not totally end up to other actors. This can lead to a loss of knowledge that could slow down the development of the sector.

Industry informality makes this problem more visible. Inside informal networks, trust plays an important role. Generally, networking increases the trust between the actors inside networks and decreases the trust to actors outside the network (Fuller-Love, 2009). To gather this trust the new actor must be accepted by the other actors inside the network. It is often a long time, and that way will prevent new companies from entering the sector and reduces the possibilities for short-term collaboration. This will slow down the innovation inside the networks when there is no new knowledge outside the network. This is problematic when the actors are trying to overcome the biggest problems of the industry right now. These include the problems with supply and demand. Pickers do not get information soon enough to fulfill all the orders from the other actors in the supply chain. These problems could be overcome with more formal and easier platforms to acquire new information without the need for long term collaboration in networks. The informal tacit information should be transformed into more explicit information on systemic level and so that it could be provided easily for new companies inside the industry.

Development towards this is also the wish of interviewees. As networks develop, most actors would like to see them formalized. Formalization would ensure a clear distribution of costs and ensure continuity of cooperation. Contractual cooperation agreements would ensure that the various operators receive the fees due to them, thus creating a sustainable and long-term cooperative relationship. The network would be used to organize freezing and joint events. An enlarged network would aim to generate business all year round, for example through sales fairs. The current state of observed collaboration and knowledge exchange is represented in Figure 1.



Figure 1: Current state of observed collaboration and knowledge exchange

#### 4.5 Discussion

The development of the natural product sector is still in its early stages. The immature nature of relationships can be identified from the informal the companies. relationship between These relationships are key parts when actors are transferring knowledge to each other. This confirms the previous studies that had noticed similar results from the natural product sector and Finnish agriculture (Chang et al., 2023; Kämäräinen et al., 2014). Different actors inside collaboration networks have strong trust in each other. Actors have strong relationships with other actors and the trust is made through social capital. Social capital enables the trust between partners to be open from knowledge exchange (Gölgeci & Kuivalainen, 2020).

Immature nature was also confirmed by the knowledge transfer inside collaboration networks. Knowledge is in tacit format and is linked with actors with long experience in the field. This creates difficulties in the dissemination of this knowledge (Sita Nirmala Kumaraswamy & Chitale, 2012). Knowledge is not transformed to explicit format and that way can only transferred with communication. This is a problem specially when the actor's relationships with each other are informal. Communication is made in traditional and digital ways. Despite the use of digital channels most of knowledge is not saved for websites or other more formal channels (Lafrenière et al., 2013).

Collaboration is popular and actors do want to develop that. Actors are open to knowledge dissemination and that is encouraged. Collaboration is expected from new actors joining the sector. Still, there are bottlenecks. This can be seen as a result of to the immature nature of the sector. Effective dissemination of knowledge needs trust, openness, and powerful strategies to work properly. (Li et al., 2015) The sector has strong trust between different collaboration actors, but the structured way of knowledge is still rare. This also reflects the transformation of tacit knowledge into explicit.

The lack of structured ways of knowledge dissemination might be due to the small size of the companies. Micro and small-sized companies have limited resources to innovate and create new business opportunities(Lin & Lin, 2016). This can be seen as actors might not have enough resources and expertise to implement effective dissemination strategies after the main business of companies.

Actors are utilizing the knowledge they can gather. This makes knowledge management a powerful tool for actors. Utilization makes it possible to benefit from the knowledge pool that is available through collaboration (Ouakouak & Ouedraogo, 2019). Still, the bottleneck stays in the dissemination of knowledge, and that way all the knowledge is not available for utilization. This confirms the previous studies that have found that there is still a lack of knowledge in the natural product sector.

#### OGY PUBLIC ATIONS

# 5 CONCLUSIONS

Knowledge management can lead to competition advantages for companies and collaboration networks. Knowledge management processes are in critical part when investigating the real effects of knowledge management This becomes more important when working with development and immature fields. Small companies can fill the lack of resources with the knowledge acquired from collaboration networks. This research identified the collaboration networks where knowledge is created and exchanged inside natural product sector.

#### 5.1 Scientific Implications

Knowledge management is an important part of a company's competitiveness (Tubigi & Alshawi, 2015). Companies must handle the different processes inside the knowledge management to get real benefit out of it. The most important processes are the dissemination and utilization of knowledge.

Especially the utilization of knowledge is important because it realizes the value of knowledge.

Knowledge can be generated and transmitted in a lot of different ways. The creation of knowledge can differ between the different types of knowledge. Informal tacit knowledge needs powerful practices for the dissemination of knowledge. This needs often the socialization between different actors or transformation to a more explicit easier to transfer format(Sita Nirmala Kumaraswamy & Chitale, 2012).

These social actions are critical when creating innovations and creating new business opportunities in a developing field (Möller et al., 2009). Social activities can occur inside different kinds of networks. These networks create a platform for different actors to collaborate and change information with each other. Collaboration networks can be divided into two groups based on the formality of the collaboration connections.

Finally, the knowledge gathered from collaboration networks needs to be used. Utilization of gathered knowledge is the key part of actually achieving additional value. Without powerful utilization, the knowledge creation and dissemination can be pointless (Ouakouak & Ouedraogo, 2019).

## 5.2 Managerial Implications

Collaboration inside the natural product sector in Finland is common. Different actors in different states of the supply chain have positive attitudes towards collaboration. Collaboration is seen as the way how the industry sector could develop. From the industry, the formal and informal networks were identified.

Formal networks are built around the exchange of goods between actors. These goods include different kinds of natural products for wholesale and processing. Inside these relationships, the contracts play an important role. Contracts have been made about the amounts and quality of needed natural products. Some strategic collaborations can be identified but they are still small and unsystematic. Most of these formal network connections are built on top of the informal relationships between company persons. The friendship creates a good collaboration base for a deeper more formal connection.

Alongside these formal networks are the informal networks. Inside these networks, collaboration is made from the exchange of goods to helping friends in the same industry. The relationships between persons inside companies have a strong impact on how deep the collaboration is. Knowledge is shared in both networks between actors. Most of the shared knowledge is in tacit format and is exchanged in different kinds of situations face-to-face and by telephone. Actors with long careers in the industry have an important role in disseminating knowledge to other actors. They have the knowledge base of the industry which can be used for industry development. Tacit information can work as a bottleneck when trying to develop the field. It is difficult to disseminate effectively and can rule new actors outside of the industry.

#### 5.3 Limitations and Further Research

This study offers a limited view of the research due to the case study nature of the research. The collected data is limited to one region and should be extended in further research. Future research should be focusing the way how the knowledge could be transformed into a more formal format and extend also out of the networks for new actors in the industry. This could help the development of the whole industry to overcome the bottlenecks of knowledge. Further research is needed for providing better network analyse of the industry. The sample size of this research did not provide enough evidence to tell the extent of the network.

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