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Transforming Developing Countries Agrifood Value Chains

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ABSTRACT

The global agrifood trade is highly reliant on developing countries, which affects value chain transformation and which often results in an imbalance of governance and value addition. In order to address this imbalance and increase the overall value creation, this paper develops and empirically tests a framework for agrifood value chain transformation in developing countries. The research employs a qualitative methodology to explore the proposed framework, which is based on a value chain maturity assessment of current practice and identification of a transformation route. Three primary value chain maturity levels in developing countries are established: traditional, managed, and best practice. Each level is determined using key indicators relating to governance (vertical-horizontal coordination, and information flow) and value addition (value orientation, safety, and quality). The application of this framework to Indonesia's cashew nuts value chain reveals a mix of traditional and managed practices. The short-medium term transformation focuses on enabling farmers, as the decoupled actors, to advance from a traditional to a more managed chain. Further, the major wholesaler and exporter are identified as highly influential in driving the transformation process. The long-term transformation focuses on developing best practices regarding branded value addition and collaborative governance. This framework offers a novel value chain transformation approach based on a maturity assessment technique leading to the identification of transformation routes. This method takes a holistic transformation approach via the evaluation all the value chain actors' governance and value-addition capabilities. Follow-up research is required to identify the enablers and barriers of globalised value chain transformation, especially with respect to sustainability.

***Keywords**: Value Chain Transformation; Maturity Level; Developing Countries; Agrifood, Cashew Nuts*

1 Introduction

Many agrifood value chains in developing countries are currently facing challenges to transform and become more globally integrated. Globalization has increased market access and recued traditional barriers to source location and the logistical flows of food production and processing (Collins, 2014). Along with globalization, sustainability has emerged as an increasingly pressing issue and has fueled the importance of safety and quality in the food sector (Liu et al., 2019). As high-value food chains are mainly produced in developing countries (Royer et al., 2016), the global agrifood industry is largely concerned with ways of effectively structuring value chains. Sourcing activities, in particular, have received increasing attention as the industry seeks to secure food quality and safety through vertical coordination in developing countries (Hernández et al., 2014).

Despite the increase in global value chain (GVC) integration, transforming value chains in developing countries is challenging. The transformation process often results in an imbalance in terms of governance and value addition. This is because the predominant actors of value chains in developing countries are smallholders (Mishra and Dey, 2018; Siddique et al., 2018). However, global sourcing tends to prioritize processors and consumers over smallholder farmers (Sjauw-Koen-Fa et al., 2018). Thorpe (2018) argues that when smallholder farmers are included in global value chain governance, they are kept in a weak position and lose out on higher value selling opportunities, because the global player's leverage their technical expertise and market access. These global players are progressively targeting developing countries sources (WTO, 2019), whilst retaining the higher value-add activities (Trienekens, 2011). The upshot is that global players exert their power to capture most of the value, while smallholder actors in developing countries have limited ability to retain the value of commodity exports. Globalization, therefore, leads to social and economic inequalities between developed and developing countries (Cavagnaro and Curiel, 2012).

Previous research into value chain transformation has focused on integrating the domestic production into the global value chain by emphasizing transaction costs, market linkages, value chain upgrading, and poverty reduction (Gómez and Ricketts, 2013; McCullough et al., 2008; Reardon et al., 2009; Donovan et al., 2015). These areas of focus have provided valuable insights with respect to facilitating value chain development, but the integration structure of these transformation processes has been largely overlooked. More specifically, there has been minimal attention on ways of effectively transforming and integrating a value chain and aligning it to a framework structured around maturity levels of practice with respect to governance and value addition. Integrated practices could provide more collaborative actions in planning, problem solving, and improvement of positions through an open information exchange (Childerhouse and Towill, 2012). An evaluation of value chains that is underpinned by a focus on transformation pathways will enhance understandings of how to facilitate the participation of actors in developing countries with respect to global agrifood trade.

This paper develops and empirically tests a novel framework for agrifood value chain transformation with a focus on Indonesia, a developing country. The primary objective of this paper's framework development is the use of value chain maturity as a means for evaluating current value chain status which then leads to the identification of transformation routes. The importance of maturity level assessment lies in the provision of critical elements for an evolutionary analysis in terms of experience and the quality of practices (Lahti et al., 2009). The maturity levels employed in this paper are constructed around governance and value addition, elements drawn from theoretical work on the value chains of developing countries. Hence, the findings of this paper will help to refine knowledge around the participation of developing countries in global trade. Indonesia's cashew nut sector is used as a case study to demonstrate the application of the framework forwarded by this paper. Nearly 99% of cashew nut production in Indonesia is under smallholder farmers (Ministry of Agriculture, 2017) and, to date, most studies of this industry have examined production aspects (Rosman, 2018; Susanto, 2018) and competitiveness (Fauziyah et al., 2017; Zahir and Sanawiri, 2018). Meanwhile, the majority of value chain studies have taken place in Africa (Bassett et al., 2018; Monteiro et al., 2017), Vietnam (Chi et al., 2018), and India (Manikandan et al., 2017). As a key supplier of the raw ingredient in the region, Indonesia's cashew nut industry offers a novel opportunity to investigate a value chain in the context of a developing country.

This paper is structured as follows: the next section is a literature review which forms the theoretical bases for this paper's framework development. The review focuses on research on value chain theory with respect to developing countries. Next, the method section explains and justifies the approach employed in this paper before the results section reports on the empirical application of the framework and identifies key findings. The last two sections, the discussion and the conclusion, connect the findings derived here to prior research and draw out the original contributions.

2 Literature Review

The value chain (VC) concept has an embedded approach that facilitates the exploration of transformation knowledge. This concept has a strategic tool to identify potential stages to increase customer value and to understand business relationships (Chofreh et al., 2019), and it also foregrounds the dynamic inter-linkages of various productive sectors to enable global integration (Kaplinsky and Morris, 2000). From this, the capacity of the value chain to formulate transformation strategies comprise three key elements: value source activities, relationships, and the interconnections between activities that bring value.

2.1 Value Chain Transformation Perspectives

Research on agrifood value chain transformation includes a range of perspectives, reflecting the impact of rapid business changes and shifts in the way this concept has been focused and framed. For example, the definition by Reardon et al. (2009) places an emphasis on the restructuring of the agrifood sector within the procurement of a modernized system. Indeed, the agrifood value chain has evolved towards a modern system to provide greater value to consumers in the form of more processed products and consistent standards, with respect to product quality and safety practices (Miller and Jones, 2010). However, the processing of plant-based and highly perishable products make the agrifood sector sensitive to the raw market behavior and market organizations (Zocca et al., 2018). Table 1 summarizes relevant value chain transformation perspectives by focusing on developing countries.

Table 1.
Summary of Relevant Value Chain Transformation Perspectives

Transformation Concept	Indicators	Source
Traditional into Modern VC	Transaction scale, investment, stages (wholesale, processing, retail, procurement system, standard) vertical coordination	Reardon (2009)
	Supplier, market, coordination, product availability, profit, and market share	Gómez and Ricketts (2013)
	Value chain upgrading through the process, product, functional/interchain, intra chain	Gereffi et al. (2001); Kaplinsky and Morris (2000)
	Value chain upgrading through the process, product, functional/interchain, intrachain, horizontal coordination, vertical coordination, enabling environment	Mitchell et al. (2009)
Traditional-Transitional-Modern VC	Spatial orientation, fragment structure, technology within labor utilization, standard (public and private), market orientation	Reardon et al. (2019)
Domestic Traditional Chain-Domestic Modern Chain-Export Chains	Stages practices (consumption, retail, processing, wholesale, procurement system, production system), vertical coordination	McCullough et al. (2008)
Traditional Chain, Managed Chains, Best Practice Management	Value orientation characteristic (balance between price and value, information sharing, time orientation, relationship, interaction, dependence in the chain, power in the chain, orientation)	Collins (2014)
Value Chain Development	Integration, market access, supporting functions, rules of the game,	ILO (2016)
Resolving Bottlenecks to Strengthen Value Chain	Governance and value chain upgrading	Pérez and Oddone (2016)

Most of these studies suggest that, for developing countries, the transformation will generally start from a traditional value chain model to a modern value chain model**.** A traditional value chain is customarily practiced by an agriculture-based economy with small-scale farmers and traders as primary suppliers, and wholesalers who link the producers with small-scale processors and retailers (McCullough et al., 2008). According to Gómez and Ricketts (2013), many developing countries change the orientation of the value

chain to a final market focus through the involvement of multiple value chain actors that are attached to the modern domestic market, however, this is not always the case. For example, the product flow may focus on export markets as well as domestic markets (Norton, 2017). Kaplinsky and Morris (2000) contend that for export-oriented products, the value chain may target specific destinations. Exporters often target their needs to specific raw commodities or processed products by proliferating vertical coordination in developing countries (Hernández et al., 2014). As such, three major value chain orientations can be summarized: Traditional Value Chain, Modern-Domestic Value Chain, and Modern-Global Value Chain. In order to focus on managing the value chain integration, Collins (2014) suggests employing three levels of orientation: traditional chain, managed chain, and best practice value chain.

The aforementioned studies (Table 1) offer useful insights to assess and transform value chain through different means and indicators. Most of these studies have considered transaction costs, coordination along with market linkages (Gómez and Ricketts, 2013; Reardon et al, 2019; ILO, 2016), and value chain upgrading (Gereffi et.al, 2001; Kaplinsky and Morris, 2000; Mitchell et al, 2009, Pérez and Oddone, 2016). Although these indicators are important in enhancing value chain practice, these studies have given limited consideration to how an integration that aligns with the value chain structure may be achieved. As Griffith et al. (2017) note, structure is essential in value chain practice enhancement. Indeed, some scholars have looked at structure-based transformations which reflect current levels of practice (Minten et al., 2020; Reardon, 2015), but a systematic approach to realizing these transformations remains underdeveloped. Typically, value chain transformations in developing countries fail to give sufficient recognition to structure-based transformations which, in turn, result in an immature integration that is unable to gain optimum benefits. As Lee et al. (2010) argue, the value chain benefits derived by the main actors of developing countries primarily depend on the structure in which they are involved. A lack of integration often causes a critical gap in practices, such as mismatching goals, disjointed planning, discrepant schedules and timeframes and incompatible work cultures (Childerhouse and Towill, 2006). A transformation of the value chain into an aligned structure is therefore critical. A key insight drawn from the aforementioned studies, and which underpins this paper's approach, is the way in which actors both integrate to improve their role and interact to enhance value creation. This insight enables the identification of two dominate value chain dimensions: governance and value addition.

Governance includes three elements: vertical coordination, horizontal coordination, and information. The vertical coordination element involves power distributions along the chain (FAO, 2014; Mitchell et al., 2009), the relationship between actors (Trienekens et al., 2018), transaction terms, profit orientations, negotiations and standard settings (Collins, 2014). Strong vertical integration enables powerful interlinkages and actions between actors in the chain. In contrast, horizontal coordination relates to the collective actions between similar players, such as producer organizations (PO) and cooperatives, which aim to improve productivity, market access, and inclusiveness by strengthening the bargaining power of farmers/members (FAO, 2014a) and greater economies of scale (Thorpe, 2018). Garnevska et al. (2011) suggest that the successful development of POs has been majorly beneficial to members and their rural communities. The third element of governance, efficient information flows and sharing, positively affect performance (Bochtis et al., 2019). Efficient information may be defined as a symmetrical flow of information and significant information sharing between value chain actors. Information asymmetry may lead to market failure (Mishra and Dey, 2018; Reardon et al., 2009), whilst information accuracy affects decision making (Collins, 2014).

Value addition puts quality, safety and value orientation as the most critical attributes, which can be evaluated through a series of agrifood product transformation activities (Collins, 2014; Norton, 2017). Pre-harvest quality is where the value to be added aims to keep the product fresh and ensure quick transportation whereas post-harvest quality is focused on transforming raw materials into various processed activities (Berry et al., 2015; Norton, 2017). Many authors have also examined the issue of quality interpretation based on private and public standards (Jaffee and Henson, 2005; Reardon et al., 2009). This attention is owing to the way in which private standards gained a competitive advantage by recognising a proliferation of expectations and subsequently capturing value in, the food industry (Lee et al., 2010). Food safety is another issue that has gained scholarly attention. Collins (2014) defines food safety as preventing the microbiological contamination of products beyond permitted limits, and involves trust-building and production methods. The issue of food safety has also broadened to encompass traceability (Lee et al., 2010). Finally, value orientation (from the lowest to the highest value) has a vital role in value-added activities (Collins, 2014).

2.2 Agrifood Value Chain Transformation and Maturity Level Assessment

Understanding the value chain transformation in relation to an integration structure requires an appropriate assessment tool. Value chain mapping is acknowledged as a baseline assessment of current value chain practice (Chofreh et al., 2019; Zokaei, 2010). However, maturity level assessment offers a powerful analytical tool to understand the phenomena of value chain transformation since it accords value chain mapping with the status of practice identification. Maturity level concepts have received increasing attention in chain practice discussions, either as assessment instruments or as part of an improvement framework (Lahti et al., 2009). However, the concept of maturity levels has been primarily developed in the industrial sector (Batista et al., 2019; Seidel-Sterzik et al., 2018), and applications of this concept to value chain transformation contexts are rare.

This paper explicitly designs the maturity level assessment to facilitate agrifood value chain transformation in developing countries. Although other maturity levels have been established using scales evaluation, such as numerical (Done, 2011) and standard performance (Seidel-Sterzik et al., 2018), this study delineates maturity levels based on normative practices in developing countries, to reflect transformations from the lowest levels of practice to more advanced levels. The value chain maturity level assessment is guided by the recognition that prevailing actors are a prerequisite to orchestrate transformation into their respective routes. In this light, local actors are regarded as part of the developing country's strategic value chain design (Donovan et al., 2015). Table 2 summarizes the maturity levels found in typical value chain transformations in developing countries.

Table 2.
The Maturity Levels in Typical Value Chain Transformations in Developing Countries

Indicators	Traditional Chain	Managed Chain	Best Practice Chain
Governance			
a. Vertical Coordination	Short term transaction-based, Self-maximizing, Adversarial, Price-based negotiation, No standard product, Centralized to wholesaler channels	Ruled short term-medium transaction, Chains profit as the second priority, Firms are the negotiator, Upstream standard within downstream management	Binding medium-long term transaction, Chains maximization, Collaboration, Total focus on consumer standard arrangement
b. *Horizontal Coordinatio*	Independent actors and individual power	Usually relies on others	Interdependence with consumer's power
c. Information sharing	No significant sharing (asymmetry)	Some information sharing	Extensive-direct information sharing (symmetry)
Value Addition			
a. Safety	No traceability, no standard	Some linkages with private standard available for traceability	Public liability and safety standard
b. Quality	Public standard	Private standard and quality control based	Tight private standard
c. Value Orientation	Commodity based and unsegregated (least value)	More processed based (more value-added)	Brand and certified processed based (highest value)

Modified from relevant sources (Collins, 2014; Humphrey and Memedovic, 2006; McCullough et al., 2008; Reardon et al., 2009)

Table 2 shows the crucial gaps in the value chain maturity levels based on integration. In most discussions, integration is regarded as an indispensable element to achieving a successful operation (Childerhouse and Towill, 2011). The traditional value chain practice features a less-integrated value chain. Informal coordination systems on governance and commodity-based value addition prevail for various reasons. The

agrifood commodities are predominantly produced by smallholders, who have low production volume, inconsistent quality standards, limited capacity for high-value addition, and poor market access (Mishra and Dey, 2018; Sjauw-Koen-Fa, 2012).

The managed value chain tends to have a more formal system with integrated governance and control of value addition. As mentioned earlier, most chains in developing countries target modern-domestic markets (Gómez and Ricketts, 2013). Hence, the structuring of a traditional value chain into a modern chain involves the need to produce a standardised product. As the agrifood industry increases the importance of private standards (Lee et al., 2010), modern-domestic chains frequently involve the role of firms to control and engage in more information sharing compared to those in traditional chains (Collins, 2014).

The best practice chain, which aims at global markets, is associated with mature governance and selective chain participation within a high-value market focus (Mishra and Dey, 2018). The best practice chain tends to incorporate and involve collaboration to generate best value benefits for global consumers. It often involves certified brands of leading firms (Lee et al., 2010). The greatest distinction between modern-domestic and modern-global markets is the governance power at hand, wherein global leading firms are powerful in directing the business (Gereffi et al., 2001; Kaplinsky and Morris, 2000). In addition to this, sustainable practices are strongly associated with global market functions (Pappa et al., 2019) and global buyers typically demand certifications as a form of guarantee (Hernández et al., 2014).

2.3 Modified Agrifood Value Chain Transformation Framework

Based on the theoretical approaches discussed, Figure 1 illustrates a modified framework as an alternative value chain transformation method:

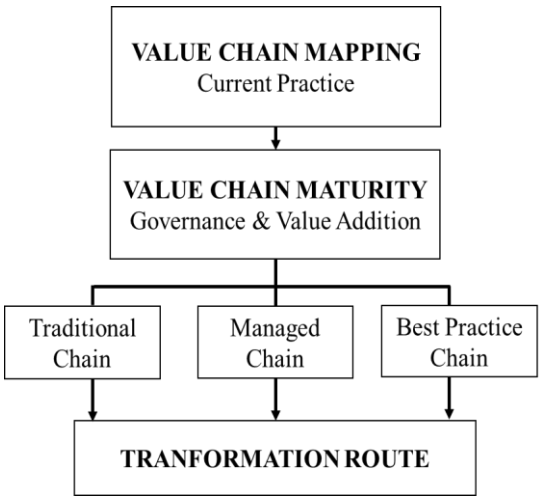

Figure 1. Value Chain Transformation Framework

This framework views the value chain transformation as an integration effort between value chain actors aiming to achieve greater inclusion and more beneficial value participation through an alignment between governance and value addition. The initial step of the framework is value chain mapping to collect an initial overview of key actors and their current practices (DFID, 2008). The next step includes assessing the current status of the three value chain maturity levels: traditional chain, managed chain, and best practice chain. The status of each maturity level is assessed in relation to governance (vertical integration, horizontal integration, information flow) and value addition (value orientation, safety, and quality). Based on the maturity level assessment results, the final step involves identifying the value chain transformation route. This step identifies where, in relation to governance and value addition, the practice requires enhancement. These are noted as flaws in the current practice, which need to be changed in the future while preserving the benefits of the current practice. The actors who suffer most of the vulnerabilities are seen as decoupled actors. In order to transform the value chain, the power holder actors need to work with the decoupled actors to orchestrate the transformation towards the appropriate route. The sequences outlined in Figure 1 aim to offer a consistent structure in the value chain transformation for actors in developing countries.

3 Case Study Application

3.1 Description of the Case Study Area

Indonesia is an agricultural-based developing country, which is seeking an agrifood value chain transformation opportunity by encouraging and prioritizing the export of high-value products. The agricultural sector employs around 31% of the total labour force and utilizes a similar proportion of the country's landmass (FAO STAT, 2017). The agricultural sector plays a primary role in the nation's food supply, GDP contribution, rural household income and labor absorption (Ministry of Agriculture, 2015; Statistics Indonesia, 2018). One of the high value food products that has been identified as a positive contributor to the nation's economic development is cashew nuts (Dendena and Corsi, 2014).

Indonesia is a notable global producer of cashew nuts, with aspirations to expand further. However, over 70% of its cashew nut production is exported to other countries as a raw commodity (Ministry of Agriculture, 2017). As the cashew nut is a high-value food with perceived health benefits (Vadivel et al., 2012), in 2014, Indonesia's Ministry of Trade proposed to restrict exports of raw cashew nuts. The 'Cashew Nuts Belt' program, consisting of extensification and intensification, targets the main producer areas in Indonesia (Plantation Agency of East Java Province, 2017). In 2016, a government regulation earmarked cashew nuts as a potential commodity to receive support in terms of planting and the processing of capital investments (Presidential Regulation, 2016). With Indonesia's cashew nut industry reaching a pivotal point in its development, an evaluation of its value chain transformation path is both timely and apt as a case study for value chain transformations in developing economies.

Empirical data was collected over a five-week period in early 2020 on Madura Island of East Java Province, a notable cashew production region in Indonesia. With government assistance, Madura Island implemented the 'Cashew Belt' program in 2014, with the aim of developing and intensifying an area of approximately 2,660 ha (Plantation Agency, 2014). In total, the cashew planting area was around 30,167 ha, with approximately 0.76 ton per ha productivity (Susanto, 2018). This area is adjacent to Indonesia's second largest city, Surabaya (shown in Figure 2), which is also the location of the trans-national trade port facility (Widjaya and Tanuwidjaja, 2017). Of the four Regencies on Madura Island, Sumenep Regency was selected for this study because it is the main producer of cashews (Jadid et al., 2017).

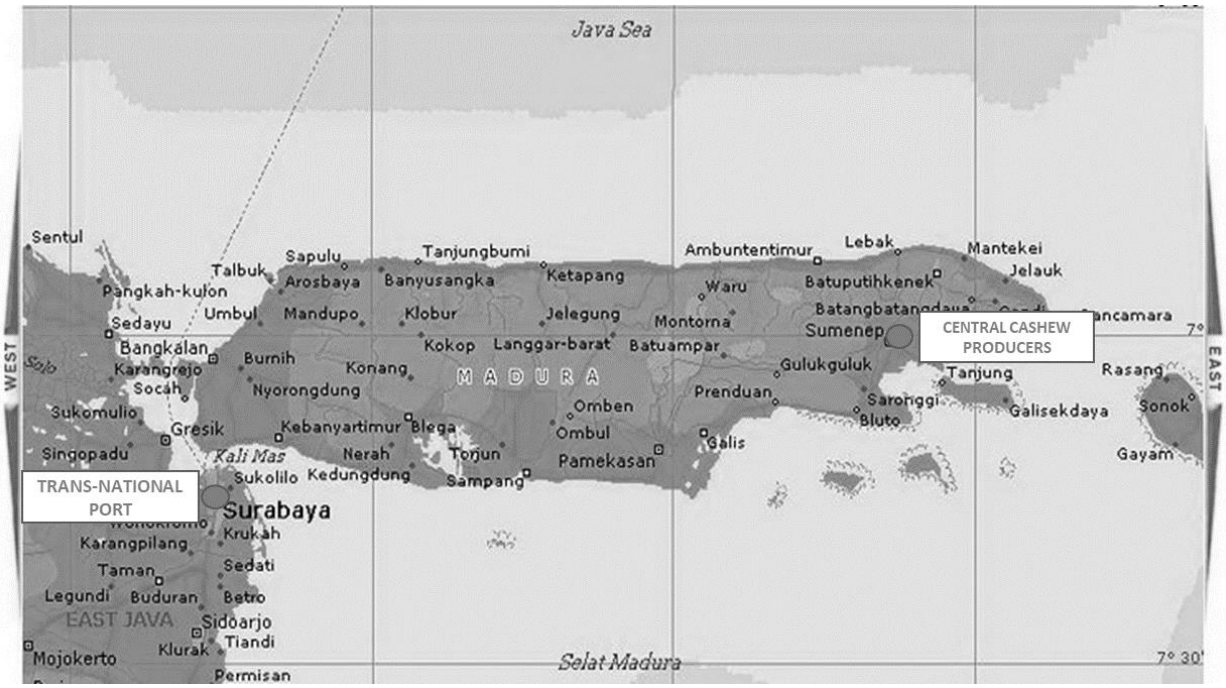

Figure 2. Madura Island and Surabaya Port
(Source: https://peta-kota.blogspot.com/2011/07/peta-pulau-madura.html)

3.2 Case Study Methodology

This study conducted semi-structured face-to-face interviews with 25 participants who were either value chain actors or experts from associated government agencies. A qualitative approach was employed to allow for a rich exploration and understanding of phenomena relating to social and human problems (Cresswell, 2014), in this case, the current practices of Indonesia's cashew nut industry. Discussion topics were developed from the framework by focusing on governance and value-added activities. As Cresswell (2014) argues, qualitative methods encourage participants to share their views, and in this study, respondents were asked to comment based on their experiences and to provide additional information to support their perspectives. In order to maintain the reliability and validity of the data, interviews were combined with photographs, recordings, and relevant secondary documentation.

Snowball sampling was used to identify participants who were value chain actors. This sampling method is crucial for gathering data from a fragile population, as samples need to be collected from within a social context that involves multi-stage processes (Naderifar et al., 2017). In this study, the identification of potential interviewees subsequently led to the recruitment of their contacts as other potential interviewees. The data set includes seven farmers, three heads of farmer groups, five intermediaries (including a wholesaler), two processors, and one major exporter. Participants representing expertise from the government agencies comprised two officers from the Agricultural and Plantation Agency, one officer each from the Cooperative and Small-Medium Enterprise Agency, and the Trade-Industrial Agency and, finally, three extension workers who assist the local farmers with accessing governmental aid. The qualitative data collected from the interviews were analysed using spiral analysis. This approach involves the classification of categories and sub-categories in an iterative process (Cressw'ell, 2014).

4 Findings

This section outlines the findings of this study with respect to how the framework presented earlier in this paper applies to Indonesia's cashew nuts sector.

4.1 Value Chain Mapping

The results of this study show that around 75% of the cashew nuts produced are exported as a raw material and the remaining 25% are marked for domestic consumption and processing (i.e. fried and roasted nuts). The prevalent domestic market is local retail (i.e. snack stores and traditional markets).

A basic knowledge of the cashew nut material flow in the study area is vital for understanding the overall value chain phenomena. The starting point is the cashew apple (which produces the nut), which is harvested at the farming stage (Fig.3a). The nut is the trading component while the cashew apples are either discarded or used as livestock fodder. This pre-harvest quality nut is the 'wet-in-shell' nut (Fig. 3b) which are assessed in terms of skin, colour, and size. The nuts then require drying in the sun for about three to four days before they can be stored. This process results in a 'dry-in-shell' nut quality (Fig. 3b), which enables the nut to be preserved for about a year. This quality nut is then un-shelled by a tool called the 'kacep'. The process of un-shelling results in nuts with cuticles (Fig. 3c). In order to remove the cuticles, the nuts must be exposed to a short roasting period to make them easy to hand-peel. The end-product of this process produces the 'shelled nut' quality (Fig.3d), which allows for further processing purposes, such as roasting and frying. The overall product transformation is shown in Fig 3.

a. Cashew apple fruit **b. wet/dry- in-shell nuts** **c. Cuticle nuts** **d. Shelled nuts**

Figure 3. Cashew Nuts Material Flow

The complex features of each actor's contribution to the cashew value addition are shown in the value chain map in Figure 4. Overall, the cashew nuts value chain actors consist of an overwhelming majority of smallholder farmers (producers), many small-scale intermediaries, some wholesalers, and a small set of exporters (both domestic and international firms).

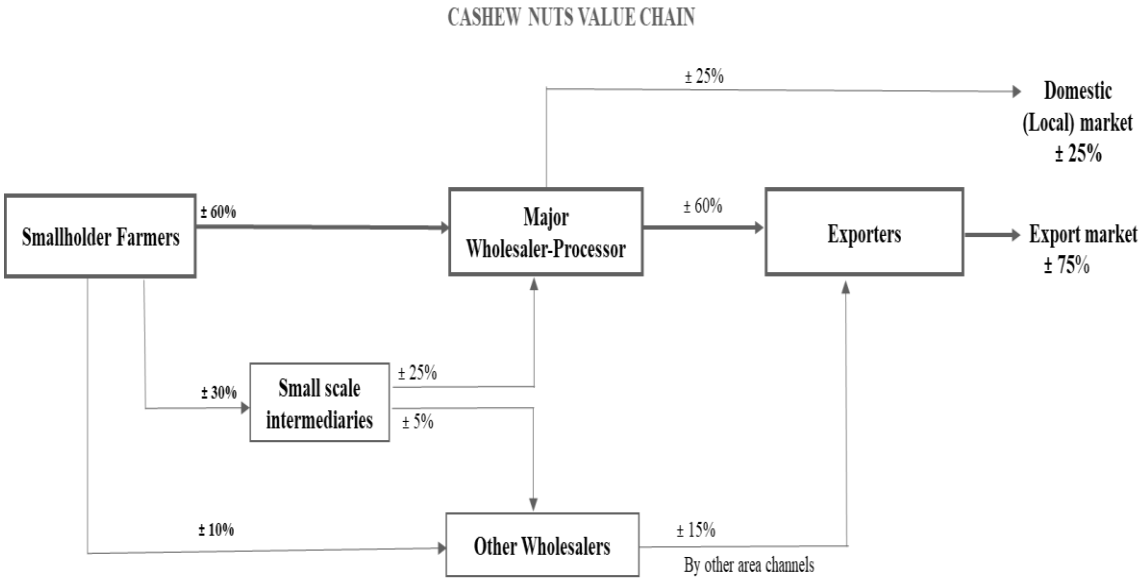

Figure 4. Cashew Nuts Value Chain

Smallholder Farmers – There is a large number of smallholder cashew farmers in the study area, each of whom have approximately 0.3 ha up to 0.4 ha of farmland with less than 100 trees. Most of these farmers primarily produce crops such as corn and paddy rice and have cashew nuts as a supplementary crop. Interviewees in this study explained that the cashew farm they managed is a family business, inherited over generations. Cashew farming largely takes place in the cultivation of berms with low input systems, is diversified with seasonal crops (e.g. corn or paddy) and involves family labor with minimal technical skills required. Newly planted cashew trees from government grants were also incorporated in a similar way. Harvesting activities involve various methods (i.e. the pole-hook, cone-shaped pole, climbing method, and '*penyandek*'/pick up). After harvesting, farmers sell cashew nuts in the 'wet-in-shell' quality, and information on the prices these products fetch are primarily gained from small-scale intermediaries or wholesalers. Interviewees indicated that approximately 60% of the cashew nuts were sold to the main wholesaler through spot price transactions. Although there are farmers groups which provide information to farmers, few of these groups deal with cashew nuts.

Small Scale Intermediaries - The small-scale intermediaries have a sporadic role in collecting products which vary in quantity and quality (approximately 30% of products). The buying volume ranges from 50 kg up to one quintal (100 kg) in the form of 'wet-in-shell' nuts. In most practices, no value is added to the cashew nuts since the raw products are directly sold to the wholesalers. Often, the intermediaries borrow money from wholesalers to buy cashew nuts from farmers, and then on sell them back to the wholesaler.

Major Wholesaler-Processor - The major actor in this region is the wholesaler who plays a central role in collecting and processing the cashew nuts. This key actor gathers most of the cashew nuts in the area, which are diverse in their variety and quality. The cashew nuts are either resold to the exporters as a commodity (about 70%), stored (for future selling), or undergo further processing. This actor controls the major cashew processing work in the area by employing families and local communities. The wholesaler in this study, for instance, indicated that approximately 25 home industry peelers were employed to do the work of un-shelling, most of whom were women in local neighbourhoods. This actor has also established bilateral contracts with exporters (since 2010) using two types of contracts: short-term (i.e. 15 days with around 60-tonne transactions), and long-term contracts (i.e. one month with hundred-tonne transactions). Currently, this actor also heads the East Java Association of Cashew Nut Farmer Indonesia (APJMI). APJMI aims to establish collaborative networks between cashew nuts growers.

Other Wholesalers - this group manages other channels for raw nuts (about 15% share). Their role is similar to that of the major wholesaler, in terms of collecting raw cashew nuts. However, their value-

added activity is limited to a drying process for storage purposes. These players sell the cashew nuts to other wholesalers in Sampang Regency (Madura Island neighbourhood regency), who will trade further with exporters. Sampang Regency is also known as a key area where cashew nuts are un-shelled, and some raw cashew nuts traded into this area are also further processed.

Exporter - The exporters in this study have mostly established contracts with the major wholesaler. In total, around 75% of local cashew nuts are traded through exporters with specific quality requirements (dry-in-shell nuts, less than 200 nuts per kg, and 1 kg in-shell nuts that are equal to 300 grams shelled nuts). Before exporting the cashew nuts, exporters have to comply with various product specifications, such as water content, moisture level, and yeast content, in addition to having a phytosanitary certificate. In general, the exporters are categorized as either foreign or domestic companies. The foreign companies are mainly from India and Vietnam. The domestic company interviewed is a processed-based exporter, who pioneered the cashew business in Indonesia (since around 1975). This company exports 'dry-in-shell' nuts to India and Vietnam, and processed nuts to China, the United States, and Europe. Currently, the company's executive leader is involved in a cashew nuts industrial association (known as PERMETIN).

4.2 Cashew Nuts Value Chain Maturity Level

Based on the cashew nuts value chain mapping, the maturity level assessment is presented in figure five, illustrating each actor's current practice status. To reiterate, the status of each maturity level was assessed based on governance and value addition activities in order to categorize the practice into one of three levels: traditional chain, managed chain, and best practice. Governance activities were either classified as informal, formal, or collaborative. Whereas, the value addition activities were either identified as commodity-based, processed based, or high-value products.

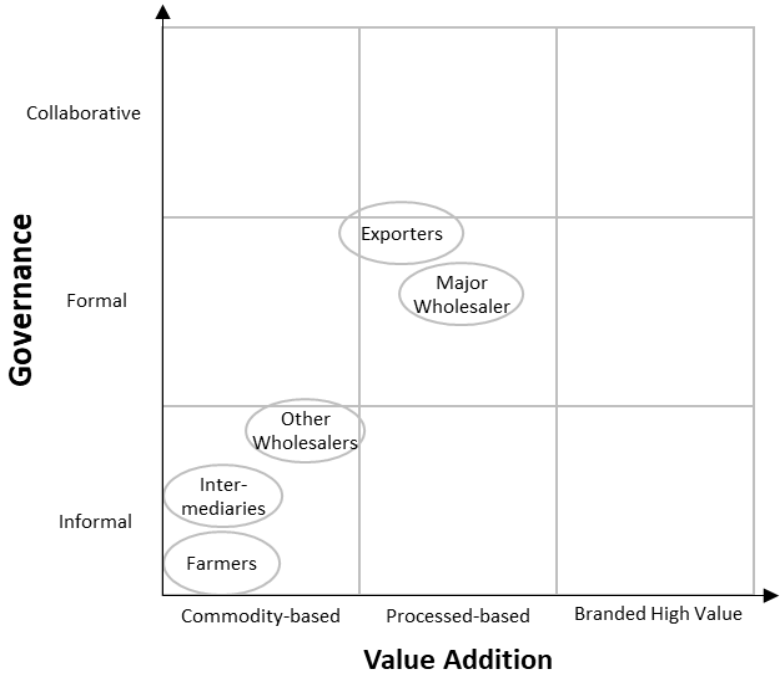

Figure 5. Cashew Nuts Value Chain Maturity Level

The overall maturity level assessment revealed a large gap in the activities between actors and the value restrictions imposed on a raw material trade, which will now be explored.

Governance

Most of the chain actors (farmers and most of the intermediaries) in this study are involved in informal relationships, whereas, the contractual/formal relationship was specifically arranged between the main

wholesaler and exporters with limited collaboration. Many of the value chain practices are transaction-based (small-scale and short-term) with limited standard requirements and bargaining opportunities. In contrast, the contracts between the main wholesaler and exporters have a set of arrangements for quality and quantity for each harvesting season. It should also be noted that the major wholesaler played the role of sole networking-trading agent between cashew producers and potential buyers.

Farmer groups had a limited role in the cashew nuts value chain in the area studied. The farmer group were mainly helping farmers to gain support from government programs because many of the members were involved in multi-crop activities. As a result, farmers mostly acted as independent actors with individual power (farmers were free to decide how to sell the product and to whom). One of the interviewees from a farmer group remarked that there was insufficient commitment from members of the group to enhance their bargaining position through collective action. In addition to this, information sharing was largely asymmetric. Although exporters provided detailed information about the required price, quality, and quantity of the product to the major wholesaler, farmers were generally unaware of these specifications.

Value Addition

The results revealed that most of the value chain actors tended to give minimal consideration to aspects relating to safety, product quality, and value orientation. In particular, the farmers' focus on producing the basic commodity, cashew nuts, meant that their farming practices overlooked numerous opportunities for value addition. For instance, many farmers could not identify their cashew trees in terms of the variety and age, causing inefficient productivity and lack of traceability. This is because cashew farming is a supplementary income and the farmers prioritize the management of other crops. Therefore, the farmers tend to sell the cashew nuts as a commodity at minimal standards (wet-in-shell nuts and unsegregated product). The fluctuating price of cashew nuts is another factor: farmers will try to sell when the price is high, and, regardless of how ripe the product is, the cashew apples will be harvested, which then severely compromises the nut quality. The farmers looked to segregation or drying processes as alternative activities but perceived them as high-risk ventures for obtaining better prices.

The major wholesaler and exporters are the key players who manage the value addition in line with export requirements. Although this study reveals that the value orientation was also confined to a commodity-based trade, it also involved some transactional standards. The major wholesaler was contracted to supply the cashew nuts to the exporters based on the water content, size, and weight requirements. The exporters also engaged in further action to align with the certification requirements of the international export market.

5 Discussions

Transforming value chains into integrated global supply chains is an extremely challenging undertaking (Gereffi et al., 2005). The proposed framework in this study provides a novel approach to assist in this endeavour with a specific focus on the common source of agrifood value chains: developing countries. This framework uses value chain mapping to provide a baseline assessment of current status (Chofreh et al., 2019; Zokaei, 2010) in preparation for identifying transformational routes. While previous studies on the value chain transformation typically recommend generic approaches to upgrading, such as process, product or governance (Gereffi et al., 2005; Kaplinsky and Morris, 2000; Pérez and Oddone, 2016), the framework here identifies tailored transformation routes based on a maturity assessment. The strengths and weaknesses of different actors' practices can be identified through the maturity assessment, which encompasses factors such as information sharing, vertical and horizontal coordination as governance indicators, and safety, quality and value orientation as value addition indicators. In doing so, the further integration that is required of each critical actor can be clearly established to achieve an aligned value chain to enhance overall value creation. This contributes to an assertion that governance and value addition are intertwined components required to leverage value chain integration. In order to gain a fuller appreciation of the value chain transformation, greater attention needs to be paid to align the maturity level practices in order to guide each actor's transformation route.

Enhancing governance often results in a significant value-addition. The value chain transformation could be accomplished by focusing on interconnecting activities that create and capture more value, as the entire networking governance competes for a successful value chain operation (FAO, 2014). In order to achieve this, the proposed framework also promotes managerial implications of value chain transformation by explicitly identifying a sequential route. The transformation route is classified into route 1 (governance focus), and route 2 (value-added focus) as illustrated in Figure 6. The best practice

value chain integration can only be achieved if the value chain achieves the highest combination of governance and value addition practices. It is noted that although the value chain has powerful governance, the chain could lose the opportunity to serve the best value market without adding significant value (unleveraged governance zone in Fig. 6). Conversely, having more value-added (branded product) without sufficient governance is unfeasible as the latter cannot be generated without governance oversight. The two transformation routes will be further explored in relation to the cashew nuts case example.

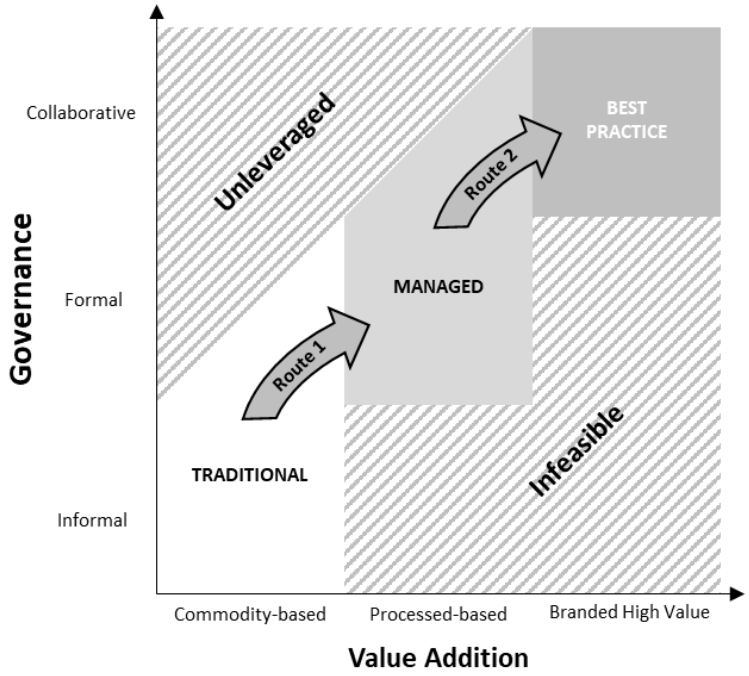

Figure 6. Value Chain Transformation Route

This empirical study on Indonesia's cashew nuts sector provides further evidence of the imbalance of power between farmers in developing countries and the export/global value chain actors (in terms of governance and value addition). In general, most of the local actors are decoupled from GVC governance (for example in the case of the cashew farmers) as they are preoccupied with traditional value chain practices. Meanwhile, the global players (key traders and exporters) have achieved a managed value chain status. The results of this study are reminiscent of the cocoa sector in Indonesia, where there is a lack of procedural fairness (Thorpe, 2018). A large volume of the cashew nuts produced in Indonesia are exported as a commodity (raw material source), which reinforces the insufficient performance of Indonesia's cashew nuts processing industry. Thus, farmers miss out on the higher value opportunity due to the commodity sales to the GVC (Thorpe, 2018) which typically do not prioritize the interests of smallholder farmers (Sjauw-Koen-Fa et al., 2018).

The maturity level assessment shows that the farmers, as the decoupled participant, perform the traditional value chain practices that are vulnerable to exploitation. While the small-scale intermediaries and other wholesalers have also been identified as traditional value chain participants, they are not a critical agent of transformation. They are minor contributors to the value chain because they add very little value to the product in their logistical role. In the context of this cashew nuts value chain case, the transformation process proposed by this study targets smallholder farmers in improving their value chain activities. Equally, it is noted that the main wholesaler and the exporters hold significant power in driving the transformation process towards a more managed value chain. However, the cooperation of these players is far from best practice management. With these considerations in mind, the following transformation routes are proposed:

- *Transformation Route 1*

Route 1 focuses on eliminating any deficient practices through governance improvement by bringing all the value chain actors into the same maturity practice. In the case of the cashew nut industry in

Indonesia, this route focusses on moving the smallholder farmers, as the weak link in the value chain, into the managed chain status by developing practices to the level of the key wholesaler and exporters. In order to achieve this, assistance and incentives will be required to develop and drive improvements in practice, such as information sharing and training. Some studies (Tessmann, 2020; Thorpe, 2018) suggest that the best practice value chain involves careful facilitation and assistance with suppliers, such as technical, production and market support. Such actions could entail horizontal coordination, by farmer groups, to contribute to strengthening their collective action capacities. Collective action establishes a single entity of producers; hence, the key wholesaler and exporters could work closely with farmer groups (producer organizations) as the main source of raw cashew nuts. The cashew value focus in this transformation is to enhance the 'wet-in-shell' quality into the 'dry-in-shell' superior quality and implement segregation to enhance the price of the commodity. While this value concentration is still classified as commodity-based, the key wholesaler and exporters need to drive this value addition through incentives and price stability. Overall, the governance improvement in route 1 facilitates all critical value chain actors to practice the same maturity level structure and establishes a more collaborative chain.

- *Transformation Route 2*

The second transformation route addresses all value chain actors (the collaborative chain) to further enhance their practices from the managed chain into a best practice chain, which will require long-term approaches and activities. Route 2 focuses on branding the high-value product to allow wider market exploration (for local markets but especially for export markets). An effective value creation and branded products would enable greater income, establish new partnerships, and attract new investors (Mili and Arfa, 2020). In this particular case, it requires a subsequent value addition into a more processed-based orientation and greater commitment to global standards, quality, and safety (Collins, 2014).

In this study's example of cashew nuts in Indonesia, the value chain actors would need to extend their contractual agreements to the long term because, as Collins (2014) argues, a binding rule leads to a total focus on consumer standard-arrangements. Russo (2016) refers to a fruit and vegetable cooperative case in Italy, where the brand is strongly related to local identities, as an example of the creation of a branded high-value product. Extrapolating from Russo's example, the cashew brand development could be addressed by establishing a strong producer organization and eco-brand cashew nuts, since farmers are using environmentally friendly farm practices. To strengthen this practice, some scholars (e.g. Chi et al., 2018) suggest that training is central to the adoption of sustainable farming practices. The branding strategy suggested by Lindgreen et al. (2013) may be applied to more processed products, which could lead to new market opportunities for the branded high-value product in developed economies such as Europe, Australia, New Zealand and the United States. As Trienekens (2011) observes, developed countries typically have higher expectations of value addition standards and systems compared to developing countries. Thus, enhanced processes and product branding will upgrade the value of the product sourced from the developing country to trade in the global market.

Value chain transformation is a complex task that requires a clear trajectory. The challenges are especially pronounced when actors along the chain engage in variable levels of practice, as with the case of the Indonesian cashew industry studied. A two-stage route is proposed to enable the transformation process. Firstly, the value chain actors should work together towards higher value products through a more formal governance structure. The second stage emphasizes a collaborative approach to enhance, capture and share value in both domestic and international markets. As Collins (2014) points out, the agrifood value chain is a system which includes the value-added domains of food safety, traceability, information systems, and quality, all of which are consumer-related and driven by technical activities and a governance subsystem. As such, a clear transformation route is vital for the value chain actors in developing countries to contribute to greater integration and profitable involvement in global trade.

6 Conclusion

The novel framework developed and tested in this paper furthers understandings of the value chain transformation process by highlighting the potential of assessing the maturity of each actor (in terms of governance and value addition) to determine a tailored improvement route. The value chain maturity level construction that centred on the typical characteristics of developing countries' transformations also provided empirical insights from a case application of the cashew nut sector in Indonesia.

Although this paper presents a significant development in value chain transformation methods, more evidence is naturally required in different sectors to verify the results. The current work has limitations specifically related to the scope of the study area, the commodity, and the methodological approach

employed. Obviously, the case study does not reflect the entire cashew sector in Indonesia or that of other developing countries. Additionally, the application of this paper's framework to other commodities may require additional adjustments, as the cashew nuts have specific characteristics (for example, the different qualities of the nut in its different stages of product transformation) which may be irrelevant to other commodities. Finally, the qualitative approach employed in this study may suggest different findings compared to a quantitative method. Alternative approaches have the potential to identify additional indicators and refine the novel framework that has been proposed here.

A potential follow-up study of this framework could examine the enablers and barriers of value chain transformation, especially by addressing the relevance of sustainable practices and certification. Global value chain transformation often entails not only product quality, differentiation and system efficiency, but also social-environmental standards and the associated business environment (Nutz and Sievers, 2015). Thus, exploring how to convert a value chain into a sustainable system will provide a more detailed perspectives of transformation and establish a stronger connection to current global market requirements.

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