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A VALUE CHAIN ANALYSIS OF AGROFORESTRY PRODUCTS IN THE SOUTH-WESTERN REGION OF BANGLADESH

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Abstract
This paper explores the market linkages in a typical agroforestry value chain in Bangladesh, particularly the participation of the micro and subsistence level farming and household-community units in this chain. The study area is *Dumuria* Upazila which is a 30 square km land area in the outskirt of Khulna, Bangladesh's third-largest city which is the located in the southwestern part of the country. Agro-products produced in the *Dumuria* Upazila and subsequently marketed in the local communities of *Dumuria* Bazar and *Gollamari* Bazar which are peri-urban locations of Khulna city. The particular objectives of this study were to assess agro-products value chains within the region and observing relationship of various intermediaries in the value chain, and to explore the impact of agroforestry practices on the socioeconomic condition of the local population. A semi-structured questionnaire was implemented to conduct the evaluation and 30 intermediaries were included for convenience in order to trace the network of market connection and identify persistent issues with the sale of agro-products in the study area. Explored network elements of the value chain have revealed that both the marketing of agroforestry crops and timber, include the intermediaries that have contributed to different forms of value-addition to the original product and produced higher gains for the participants in the value chain. Farmers at the item's place of origin complained about price discrimination, but it was discovered that end-market middlemen absorbed the lion's share of the total gain generated by the value chain. Findings of this study contributes in generating understanding the process of value creation, power structure, and gain sharing in the localized natural resources-based value chains.

Keywords: Value nodes, market linkages, intermediaries, value addition, gain sharing

Introduction

Bangladesh is an independent nation with an area of 148,460 sq. km. Approximately 140 million people are living here, and 65% of this population resides in the rural areas, who's major earnings come from the agriculture (World Bank 2016; Singha et al., 2019). The agriculture sector has long been quite influential in Bangladesh. This sector plays a crucial role in Bangladesh's economic growth. It is the most substantial sector that not only contributes to the GDP of the country but also employs a large number of labor force. In the success of this sector has a significant effect on macro-economic situation such as job creation, poverty alleviation, food security and nutritional attainment etc. Additionally, maintaining a sufficient amount of forest cover on earth is crucial for human civilization to survive (Jahan & Rahman, 2012; Islam et al., 2018). The forests of Bangladesh harbor an enormous

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wealth of natural resources where value chain plays a significant role in boosting the rate of economic development (Huda et al., 2012). However, the marketing of agro-products is vital as small-scale farmers' economies depend heavily on the sale of agricultural and forestry resources since they have traditionally relied on gathering domestically manufactured and consumed goods for their nutrition and other requirements (UNDP 2012). The existing agro-marketing system is largely dominated by numerous players in the value chain and there has been extremely weak post-harvest management. There are primary rural markets, assembly rural markets, secondary rural markets, suburban markets, and retail markets. Rural primary markets are spread throughout the country and usually is the first component in the market system for the farmers.

At the same time, these products are stimulating economic growth by contributing to the GDP, around 21.1% of which come from agriculture. Agriculture generates 45% of the country's total employment opportunity (Raihan & Ahmed, 2008; Foysal et al., 2013). However, value chain analysis specifically identifies all of the steps that take a fundamental commodity from its manufacturing in the field to its final use (Kaplinsky & Morris, 2000). Value of an item is constantly added in every level of the supply chain as a product travel from the manufacturer to the consumer through a number of modifications, transformations and transaction along a chain of related processes (Kirimi et al., 2014). Supply chain network eventually connect all the agricultural and small-scale forestry products from production to distribution. Moreover, the chain's actor's activities have been influenced by the product pathways, along with the relationship between the chain actors (Stoian et al., 2012). Additionally, it highlights the accomplishments of each link in the network (Islam et al., 2013). It is necessary for Bangladesh to recognize the challenges related to agro production and trade, since the value chain of agro-forestry in most Asian countries, including Bangladesh, is very erratic. Furthermore, it is claimed that farmers and traders do not earn anticipated profits from their investment because of different challenges. Moreover, owing to the impact of multiple influences, challenges vary from one farmer to another.

Small-scale farming predominates in Bangladeshi agribusiness, and the regional routes for distributing product-based local trade are highly unstable and sophisticated (Ali & Islam, 2013). Smallholders are becoming more enthusiastic in agroforestry practices today in order to generate more integrated, varied, and lucrative goods. It is one of the most productive, and so far, the most successful systems to increase forest area as well as the countries' land production (Leakey, 1996). Nevertheless, it enhances the socioeconomic circumstances of farmers by boosting productivity, income and crop security through balanced soil utilization and fertility preservation (Sharmin & Rabbi, 2016; Chakraborty et al., 2015; Scoones, 1998).

Agroforestry strategies are becoming more popular in Bangladesh given the prices for firewood in marketplaces (Islam & Noriko, 2012; Islam et al., 2012). Agroforestry practices in the south western part of Bangladesh have been running successfully as the Bangladesh Forest Department (FD) has benefited economically significantly because these programs are viewed as having more economic and environmental significance (Safa, 2004; Muhammed et al., 2008; Islam & Noriko, 2012). Similarly, agrisilviculture and aquasilviculture are the most prioritized agroforestry land-use practice in this region due to its geographical location, soil type, land availability, innovative farmers, cropland elevation and climatic condition. According to the studies done in the southern Bangladesh, agroforestry not only enhances farmers' socioeconomic standing and means of subsistence (Chakraborty et al., 2015; Rahman et al., 2012); but also guarantees the provision of environmental services even in deteriorated habitats like sandbars (Ibrahim et al., 2011).

Agroforestry development in Bangladesh's south-western region has increased recently, and farmers, middlemen, and consumers are all impacted by value added products in marketing channels, understanding the value chain is crucial. Due to the dearth of empirical evidence in Bangladesh on the supply or value chain strategy of agroforestry goods, this paper pioneers the assessment of the value chain of agroforestry products (Matin et al., 2008). On the contrary, it is crucial for policymakers in Bangladesh and other tropical and subtropical regions around the world to have knowledge on agroforestry from the south-western section of the country. Therefore, the objectives of this study are to assess different value chains of agroforestry products and observing the roles of the various intermediaries within it, and also to explore the impact of agroforestry practice on the socio-economic condition of the local people of the south-western part of Bangladesh.

Literature Review

Value chain conceptualization

A value chain is the total interdependent and coordinated string of activities including the phases from conceptualization of a product or service to distribution to consumption at the end and after use. This range of activities include different intermediate phases through which input-output transformation and delivery is performed at different levels, complete the desired lifecycle of the product or service (required to get a good or service for completing the production, conversion, and distribution processes, as well as the disposal phase after usage before it reaches its intended consumers (Kaplinsky, 2004; Collier et al., 2017). Value chain is typically understood by the relation among actors, activities, processes, markets, and their contributions toward the completion of the life cycle of a product or service. However, in the value chain, actors are distributed at several activity nodes. In a typical value chain, a set of actors who are business level actors, directly contribute in value generation and value aggregation in their respective nodes which are transferred to the subsequent activity node through prevailing norms of transactions and markets. While a set of actors don't contribute to value generation or value aggregation in any particular nodal level; they are institutional actors who create a facilitating or hindering context for the performance of at particular node in the value chain and transaction involving that particular node. The business level actors and institutional actors play by their own rules and norms of activities and transactions. There lies the disparity of economic and political power among the value chain's stakeholders (Mishra & Dey, 2018). Such asymmetry generates form the level of criticality of the actors' position and activities in the value chain, uniqueness of the knowledge, knowhow and resources in their possession, and the level of capability of performing the concerned activities (Kano et al., 2020). Level of asymmetry in resources and capability concentration among the actors in the value chain determine the difference of economic and social benefit for the value chain's participants (Ponte & Gibon, 2005; Fernandez, 2015).

Value chain has multiple spatial embeddedness due to geographic dispersion of the activities in the value chain (Barrientos et al., 2015). Geographically dispersedly distributed nature of the activities within the value chain has made it possible to correlate level of value chain participation of the regions with their level of economic and social development (Gereffi & Lee, 2016). Value chain analysis includes exploration of structures, activities, actors, norms and rules of transaction, governance framework, geographic embeddedness, level of participation and contribution of the actors and regions, and economic and social outputs and spillover incurred to actors, communities and regions (Gereffi & Fernandez-Stark, 2016; Bair, 2008).

Agroforestry value chain

In the agroforestry value chain, products are marketed from actor to actor till the point of consumption via the "long value chain," which completely incorporates the value chains of several actors (Nagurney, 2006). In basic words, the selling actor internalizes economic value as things are sold (profit), reflecting market, supply, and demand variables. However, some values—known as externalities—are not always internalized. They may be harmful (pollution) or beneficial (carbon capture). The advantages or costs associated with creating positive or negative externalities are not economically transferred or appreciated along the value chain. As a result, some procedures and activities provide value that is not represented by a monetary output, especially if they are environmentally or environmentally conscious procedures (Power, 2010).

In an agroforestry value chain, a farm can raise its profit margins by minimizing the use of inputs like herbicides and pesticides and replacing them with lower-cost inputs. (Garrett et al., 2017). Also, a farm may boost the price of its outputs and set them apart from rival goods by using more environmentally friendly techniques that would improve the quality of its outputs.

This independent subject focuses on the integration of agroforestry system in the extensive value chain, where the interactions between the farming system's upstream (such as for agricultural inputs) and downstream players directly influence the value generated at the farm level (e.g., buyers of agroforestry outputs). For instance, in order to compete in globalized markets, farmers involved in lengthy supply chains must focus and specialize in production (Moraine et al., 2014). Agroforestry farms that are more diverse and utilize fewer external inputs also engage in less market participation, which means they might possibly make up for lost economies of scale through economies of scope. Necessary infrastructure and distance may prevent some territorial agroforestry systems from

being integrated, and even territorial integration may present additional challenges in the form of increased management and organization requirements as well as increased transportation and logistical costs (Garrett et al., 2017; Moraine et al., 2014). There may be some stress relief if the extensive value chain and supply chain that connect input suppliers and output consumers are shortened. Greater integration between farmers may lead to Coasean agreements that increase the value produced within agroforestry boundaries, hence decreasing logistical expenses (Havet et al., 2014; Röhrig et al., 2020). In addition, direct selling, voluntary price signaling, and on-site processing may increase the perceived value of goods and bring farmers in agroforestry closer to their intended consumers, thereby reducing the amount of value transferred to intermediary actors in the value chain and allowing farmers to capture more value-added (Alam et al., 2014; Röhrig et al., 2020). For instance, once farmers are able to communicate with customers directly or through local sales channels about their products and product features, buyers are more sensitive to ecosystem services in product value (Lovell et al., 2010; Röhrig et al., 2020).

Some of the countries impose specialized system to monitor overall agroforestry value chain system. The Mexican agroforestry value strategy talked about how digital tools and technology (like drones) can be used in agroforestry and how the government can help this industry use these tools more widely. Chavan et al. (2015) took a critical look at India's agroforestry chain and listed a number of problems that could stop it from being put into place. Burgess et al. (2015) four directions for agroforestry value chain include changing the EU's common agriculture policy (CAP) to better support agroforestry farms and systems.

Value sharing process in the value chain framework

The value portion takes into account the economic activities (income, job creation, and property) of intermediate vendors and services and support (equipment, logistics, services) as well as base providers (infrastructure, capital, development of human resources, governance system, digital innovations, information and communication are required in rural areas (Wong et al., 2013). Wong (ibid.) combines value chain and cluster based agricultural development under a single strategic framework agricultural value chain plus plus strategy which describes how value builds up and shared in different functional tiers or phases of the agricultural value chain. The value chain's upstream (development and research, high-value cultivars, farming practices), midstream (processes, high-value end uses), and downstream (traceability, marketing, targeted consumers) value activities are all actively promoted (Wong et al., 2013).

The framework first plus explains the production segment of the goods. In the second phase mechanization, financing, and agro-support services will raise productivity as a result of this, and the second bonus (value addition) is anticipated to come from broader and deepened economic roles in various crucial sectors of the value chain.

The framework also explains the increasing specialization and agglomeration within a region would result from coordination and value chain integration, which might boost their product portfolio and market reach (Dhital, 2004; Ponte & Sturgeon, 2014). Second, as middle-class customers proliferate in emerging southern regions, there is an increased desire for a variety of items that are secure and of great quality. Finally, the creation of a value chain process provides pro-poor advantages since it would give low-income inhabitants of rural regions work and incomes (Dhital, 2004). Commercial partners' involvement in the value chain process should lead to cost reduction and successful business performance since it clarifies the cost structure and increases the company's competitiveness by lowering expenses. This method's goal is to lower expenses associated with both internal operations and suppliers by providing them with contractual arrangements that will increase profits (Röhrig et al., 2020).

Value chain process helps to coordinate the actions of the many players in the agricultural value chain, which generates cash, opens up employment options, and progressively reduces poverty among disadvantaged small - scale farmers (Bair, 2008; Asogwa & Okwoche, 2012). Since the majority of agroforestry activities occur in the periphery, the link of value chain and local economic development significantly contribute to the creation of jobs, the generation of income, and the reduction of poverty, which are the primary drivers of local economic development (UNIDO, 2011).

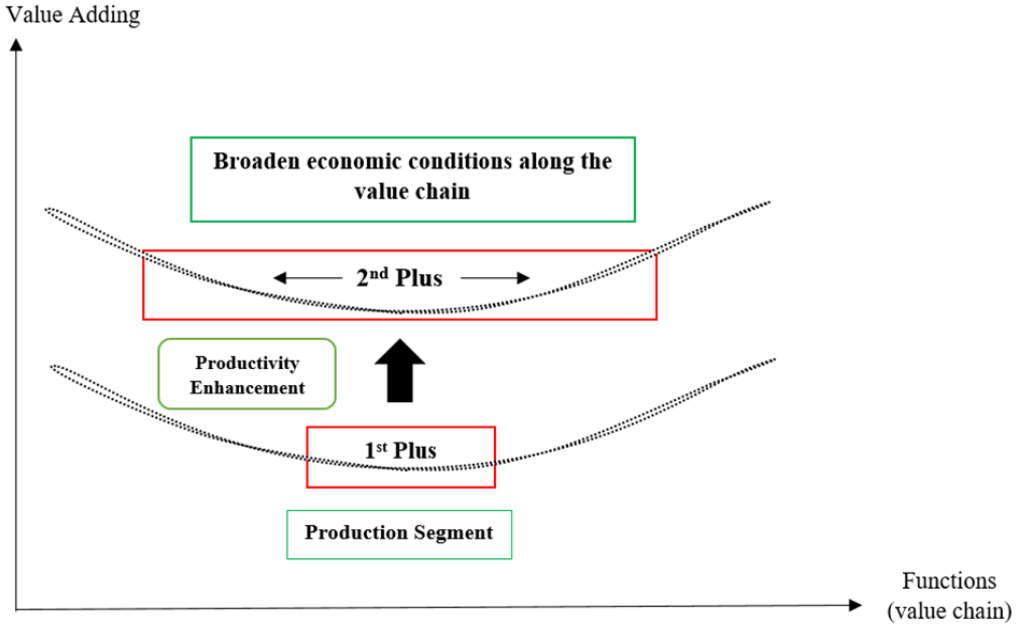

Figure 1. Value chain focused integrative agricultural development – Plus Plus Strategy
Source: Adapted version from Wong (2013)

Value sharing through value chain nodes and local economic development

Value sharing and local economic development initiatives can complement one another. Both approaches focus on the "how to" of private sector growth and may be built such that the underprivileged share in the rewards that follow. By studying it and developing interventions to get around bottlenecks and limits in the chain, value chain aims to improve how well the marketing system functions (Agbevade, 2018). Studies on local economic growth emphasized the techniques, institutional and regulatory frameworks, players, and positive results (Phelps et al., 2011). According to Pike et al. (2007) the idea of local economic growth is difficult and debatable, hence there are many different meanings.

Local economic development is founded on values and objectives that communities intentionally choose to implement in order to have an impact on their local economy and raise their standard of living. The World Bank defines it as a process by which public, private, and non-governmental sector partners collaborate to improve conditions for economic development and job creation (World Bank, 2003). Local economic development is a collaborative process that fosters cooperation agreements between the primary business and government players of a specific region. Using available resources and competitive advantage, it enables the joint formulation and implementation of a shared development plan with the ultimate objective of providing decent jobs and enhancing economy (Sarker & Ghosh, 2010). The decrease of poverty, the creation of new jobs, and the stimulation of the local economy are some of the effects of local economic development that make it possible for local economies to remain economically sustainable.

Local economic development techniques pinpoint a region's economic potential and enable local firms to cooperate with one another to boost the local economy and create jobs. Combining the methods can help to overcome any potential drawbacks of using each method alone (Saarelainen & Sievers, 2011). Due to their fundamental nature, value chain approaches transcend regional borders and are not exclusive to any one area. Unfortunately, value chain practitioners may not always pay sufficient attention to local factors such as cultural norms, regional red tape, and infrastructure development constraints. Hence, unfavorable local conditions or a misunderstanding of local conditions may provide obstacles to value chain interventions. Moreover, the cross-

sectoral aspect of value chain growth is strengthened by the connection between local governance, and development planning. In conclusion, a local economic development strategy can assist prevent some of the drawbacks of value chain growth by providing a greater grasp of local circumstances. In order for items to reach the end customer, collaboration between players is a key component of value chain growth. As a consequence of this, it is necessary for the many players to work together effectively, communicate effectively, and be responsive. Local economic development strategies that emphasize participation and social engagement can improve the necessary conversation among the stakeholders. Hence, local economic growth improves information flow along the value chain, making it more efficient and inclusive. Another way to assist local innovations that can increase the effectiveness of value chain growth is through local economic development (Saarelainen & Sievers, 2011).

Local economic development initiatives that emphasize involvement and communication might improve value chain growth; effective intervention does not always rely just on participation. Local economic development professionals could overlook the significance of value chain participants beyond the local area (Kistruck et al., 2013). However, a desired transformation in a value chain to expand or enhance production operations and provide social benefits such as poverty reduction, income generation, economic growth, environmental performance, gender equity, and other development (UNIDO, 2011). This concept centered in enhancing the entire value chain procedure for the betterment of society as a whole.

Materials and Methods

Study area profile

The study was performed at four unions of *Dumuria* Upazila under Khulna district of Bangladesh (Figure 2). The researchers made an effort to obtain accurate data by an exploratory survey to explore the demographic profile of the respondents including farmer's annual income, socio-economic benefits of agroforestry, and value chain for farm products manufactured from agroforestry. On the other side, this study also covered two commercial bazars namely *Dumuria* Bazar and *Gollamari* Bazar which have been selected from Khulna district in order to gather data for selecting intermediaries including *phoria* (middleman), *bepary* (trader), *paiker* (wholesaler), and retailer. Table 1 highlights the key components of the research area.

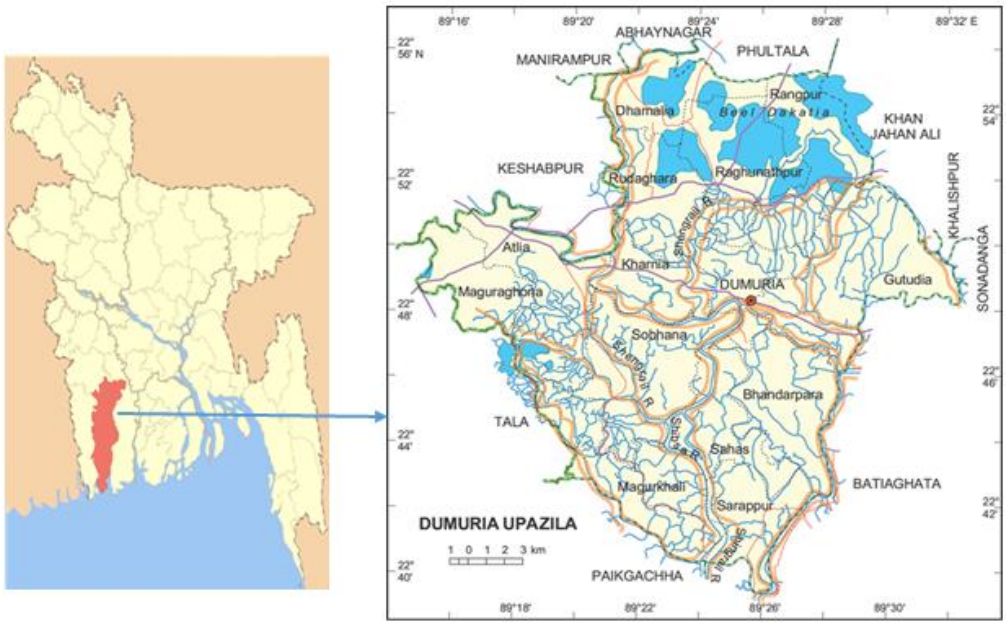

Figure 2. Geographical location of the study area

Table 1. An overview of the study area

Items	Description
Location	*Dumuria* is an Upazila of Khulna District in Khulna Division with 230 villages. It has 46,251 households and a total area of 454.23 sq. km.
GPS location	It lies between latitudes of 22°39' and 22°56' north and longitudes of 89°15' and 89°32' east.
Population	256,503 (Density: 560/km²); males constitute 53% of the population while females do 48%.
Number of villages	230
Number of households	46,251
Literacy	It has an average literacy rate of 36.1% (7+ years) where males constitute 45.4%, and female 26.5% compared to the national average of 32.4%.
Land use	Total cultivable land is 31,340 hectares, fallow land 3,240 hectares; single crop 36.5%, double crop 33.8%, treble crop 29.7%. Main crops are paddy, jute and vegetables. Main export products are paddy, rice, betel nut, molasses, prawn, mango, jackfruit, vegetables.
Land control	20% of peasants lack land, 28% have small plots, 32% have middle-sized plots, and 0.8% are wealthy; the average cultivable plot is 0.12 hectares.
Main occupations	Agriculture 46.29%, agricultural laborer 16.8%, wage laborer 4.09%, commerce 12.9%, industry 2.01%, transport 3.24%, service 4.66% and others 10.1%

Source: Authors' compilation based on a filed survey, 2019

Season of production and crop preferences

In Bangladesh, there are typically three harvesting periods. They are Rabi, Kharif-I, and Kharif-II. The first Kharif runs from March to June, the second Kharif runs from July to October, and the final Kharif runs from November to February. Since these are the key products in the study region, vegetables including potatoes, chilis, brinjal, and cauliflower have been chosen as well as the Rabi season for the study.

Sampling frame and sample

The basic data used in the study was physically gathered in the field during November to February of 2019. Data gathering for the investigation used a multistage sampling strategy. *Dumuria* Upazila under Khulna district was selected as the primary sampling unit. Out of 14 unions in *Dumuria* Upazila, 4 unions namely *Atlia*, *Maguraghuna*, *Dumuria*, *Khornia* were purposively selected as the secondary sampling units. Two villages from each union in total 8 villages namely *Maltia, Chucknagar, Bataga, Hogladanga, Khoria, Mirjapur, Baundia, Bhadradia* were chosen randomly as third sampling units. There were around 150 farmers producing crops in the study region. About 70 people were working to provide for their families on a subsistence wages. Contrary, roughly 80 farmers were involved in commercial farming. Farmers engaged in commercial farming in the study area have been regarded as the study's population. A total of 80 farmers were selected purposively from 8 villages to represent the sample.

A detailed interview schedule was then conducted to assess age, educational status, family income, savings and agroforestry status of the study area (Table, 2). On the other side, 30 intermediaries including *phoria* (middleman), *bepary* (trader), *paiker* (wholesaler), and retailer have been chosen from *Dumuria* Bazar and *Gollamari* Bazar using a random sampling method. A collection of survey questions was employed to gather pertinent data from the participants.

Data collection and analysis

Interviews were used to gather data. Face-to-face interactions were used to complete the interviews. In order to get an appropriate response to the queries and assertions, proper connection has to be formed with them. Whenever a responder had a problem comprehending a question, it was addressed and elaborated. The study's goals were coded, assembled, tallied, and evaluated using the information gathered from all of the interview sessions. Internationally recognized standards were applied to local entities. Using appropriate grading, qualitative data were transformed into quantitative data. Wherever feasible, descriptive analysis methods including range, number, percentage, mean, standard deviation, and rank order were used. In agroforestry, value chain includes some other intermediaries, such as auctioneers, local traders, local saw-mills, brickfields and wholesalers. The respondents mostly farmers and a total 30 intermediates who were purchasing and selling agroforestry items were randomly chosen from the market area

and from the side of the street as stated in the previous section. The final stage of intermediaries was where this sampling strategy was still in progress.

Findings

Demographic profile of the principal actors in the value chain

In this study, the male and female age distribution in all ages were almost the same and ranged from 21 to 60 years mentioned in Table 2. The study area's responding farmers were discovered to be on average roughly 40 years old. Table 2 also indicates that most of the farmers completed six years of schooling. Respondents replied that education facilities were poor during their time. The majority of farmers were not educated enough to negotiate or obtain market intelligence, even their native language is Bangla. Table 2 also depicts that per month, farmers earn on an average BDT 10,120 and expenditure is on an average BDT 8,971, thus, their average saving is BDT 1,920.

Table 2. Demographic profile of the principal actors in the agroforestry product value chain in *Dumuria* Upazila

Farmers			
Characteristics	Mean, N	Percentage	Standard Deviation
Age (In years)	40.35	-	8.65
Literacy rate (Schooling year)	-	26.36	-
Income (BDT monthly)	10,120.36	-	3,431.258
Expenditure (BDT monthly)	8,971.00	-	3,675.68
Savings (BDT monthly)	1,920.00	-	1,041.83
Intermediaries			
Age (In years)	41.35	-	9.75
Literacy rate (Schooling year)	-	25.16	-
Income (BDT monthly)	17,150.38	-	5,655.76
Expenditure (BDT monthly)	12,116.57	-	4,153.86
Savings (BDT monthly)	5,150.23	-	1,967.95

Source: Author's compilation based on a filed survey, 2019.

The average age of the intermediaries was around 41 years as presented in Table 2. The literacy rate of the intermediaries indicated that they had an education level on an average up to class seven. Table 2 also describes that intermediaries earn per month on an average BDT 17,150 as well as their monthly expenditure was on an average BDT 12,116. Hence, their monthly average saving was BDT 5,150.

Agroforestry-based crop value chain in Dumuria Upazila

The field investigation revealed that there were numerous marketing outlets for agroforestry goods. Sometimes, the farmers themselves sold the product. Sometimes, other channel members such as *phoria* (middleman), *bepary* (trader), *and paiker* (wholesaler) helped in the marketing of the products. The existing marketing channels are depicted in Figure 3**.**

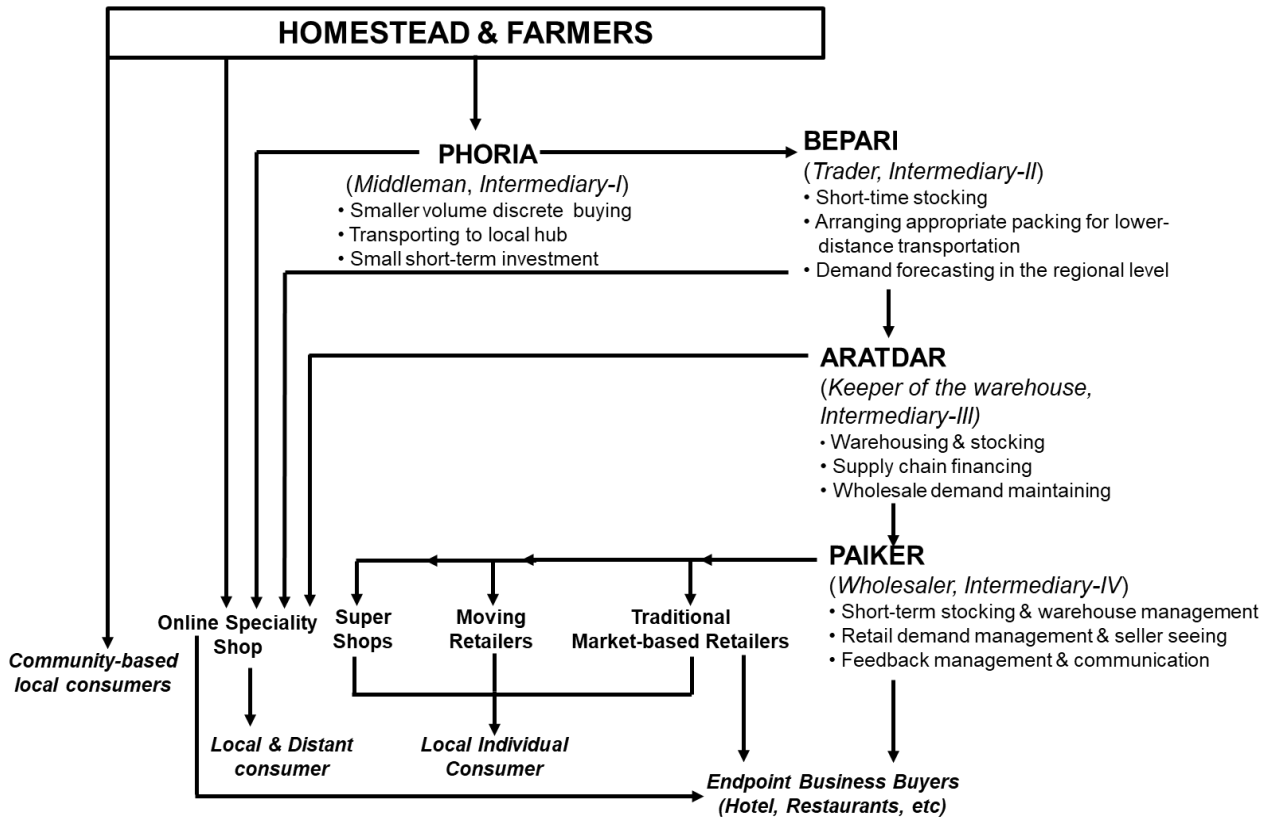

Figure 3. Stylized schematic diagram of agroforestry-based crop value chain in the study area based on a filed survey, 2019

In this study, for agroforestry crops, the primary and most prevalent network structure is made up of *farmers*, *phoria* (middleman), *bepary* (trader), *aratdar* (keeper of a warehouse), retailer and consumer. While advanced online marketing is a vast network of platforms into which marketers must essentially integrate their products, online advertising is far more sophisticated than the networks themselves. Consumers can directly buy their desirable products directly from the online platform from any of the actors including *bepary* (trader), *paiker* (wholesaler) or others. Other network structures were farmer to trader to keeper of a warehouse to retailer to consumer; farmer to trader to retailer to consumer; farmer to trader to consumer; farmer to retailer to consumer; and farmer to middleman to consumer respectfully. Network structures of agroforestry crops and the pathway of agroforestry crop distribution channels are illustrated in Fig. 3. According to the field data, *bepary* (trader) controlled the majority of crop items in these network structures in order to maintain marketing operations whereas *paiker* (wholesaler) was the next most important intermediary who further distributed the products (Figure 3).

Agroforestry-based Wood value chain in Dumuria Upazila

The timber industry in Asia has been well incorporated into the global economy. Though timber raw materials are partly sourced from overseas, timber goods are sold on domestic and foreign markets. The composition of the value chain of timber is influenced by unique product characteristics with socio-economic, political and environmental factors. In Bangladesh, the presence of numerous middlemen is quite culminated in a very complicated timber value chain. The typical timber value chain involves farmers, farmer groups, village traders, timber depots and processors. In Bangladesh agroforestry (general) timber products vertical network structure has four diverse channels and the

prevalent one is the homestead and farmer to local trader to fuelwood *aratdar* (supplier) to consumer one. However, other network structures were farmer to local trader to retailer to consumer; farmer to local trader to consumer; and farmer to local trader to sawmill to consumer. In typical agroforestry schemes, farmers sell their items directly to the intermediaries; Figure 4 shows the locations of each intermediary and timber distribution chain. This study also demonstrates that farmers sold the majority of their firewood to neighborhood traders, who in turn sold it to sawmills, brickyards, rice mills, and then directly to customers. However, wholesalers only sold a third of their goods to retailers, with the remaining little amounts going to domestic businesses (e.g., furniture industries, cottage industries). The forest-based industries in Bangladesh typically adopted a cost-management approach consisting of large-scale processing of generic low-value goods with a low assortment capacity. While it is hard to extrapolate value creation in chains, the uneven allocation of profits between chain members has been observed in most situations. Small to medium sized businesses and small-scale manufacturers typically gained the least in their chains, showing the immediate need to upgrade the value chain, which was successful in other countries.

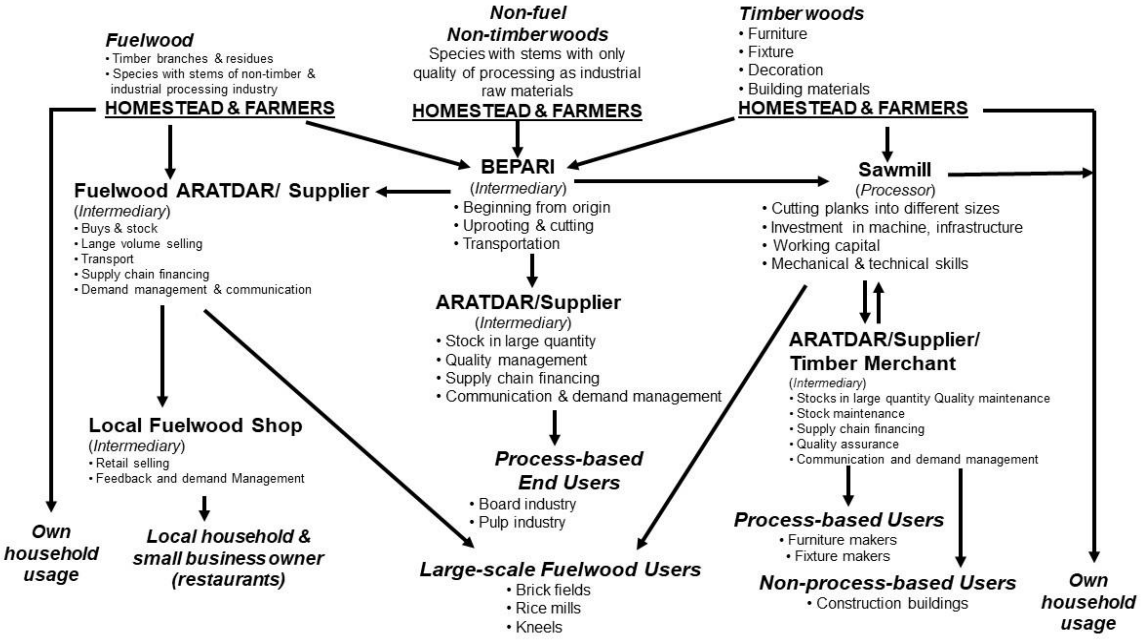

Figure 4. Stylized schematic diagram of agroforestry-based wood value chain

Value absorption and gain sharing in the functional levels of the agroforestry value chain in Dumuria Upazila

In this study, the prices of the primary crop used in agroforestry and timber including babla (*Acacia nilotica* L.) are described intermediary-wise in Table 3 and Table 4, respectively. Table 3 shows that the marketing costs of vegetables include all expenses paid to various intermediaries such as *phoria* (middleman), *bepary* (trader), *paiker* (wholesaler), retailer and farmer. During their dissemination along the value chain network, vegetables gained more value. Results revealed that the share of transportation cost was the highest (61.19%) followed by damaged (17.38%), labor wages (6.41%) and donation (6.41%) (Table 3). The total value-added cost per 100 BDT (1US$ = 84.96 BDT as on December 2002) vegetable products was Taka 1561.5 from production to consumption. Among the intermediaries, the retailer total cost was the highest followed by the wholesaler (Table 3).

Table 3. Value concentration structure in the vegetable value chain in *Dumuria* Upazila

		Intermediaries						
Cost items of vegetables (per 100 BDT)	Farmer/ Homestead	*Phoria* (Middleman)	*Bepary* (Trader)	*Aratdar* (Supplier)	*Paiker* (Wholesaler)	Retailer	Total	% of total cash
Transportation	105.5	-	205	210	225	210	955.5	61.19
Labor wages	10	10	15	25	15	25	100	6.41
Bazar toll	10	-	10	-	-	-	20	1.28
Noninstitutional expenses and business	10	10	20	25	20	15	100	6.41
Damage	5	15	35.5	40	55.5	120.5	271.5	17.38
Self-expenses	10	-	10.5	14	13	15	62.5	4.00
Others	-	5	10	14	13	10	52	3.33
Total	150.5	40	306	328	341.5	395.5	1561.5	100

Source: Author's compilation based on a filed survey, 2019

Table 4. Value concertation structure in the firewood babla (*Acacia nilotica* L.) value chain in *Dumuria* Upazila

		Intermediaries						
Cost items 1mon= 40kg	Farmer/ Homestead	*Phoria* (Middleman)	*Bepary* (Trader)	*Aratdar* (Supplier)	*Paiker* (Wholesaler)	Retailer	Total	% of total cash
Timber harvesting	8.5	-	-	-	-	-	8.5	10.96
Transportation	2.5	2.5	4.5	10.5	5.5	7.5	33	42.58
Labor wages	2	2	2	4	2	2	14	18.06
Bazar toll	0.5	-	1	1	-	-	2.5	3.22
Noninstitutional and non-business expenses	-	0.5	1.5	2	-	2	6.5	8.38
Self-expenses	0.5	1	1	1.5	1	2	7	9.04
Others	-	0.5	1.5	2.5	-	2	6	7.75
Total	14	6.5	11.5	21.5	8.5	15.5	77.5	100.00

Source: Author's compilation based on a filed survey, 2019

Value added could readily demonstrate how much more each item would cost through the marketing channel. Agroforestry products were transported through value chains, where each intermediary charged a fee on top of the actual expenses. According to Table 4, the price of 40 kg of acacia timer was Taka 77.5. Besides this, the transportation expenses for acacia timber (42.58%) were highest, followed by labor costs (18.06%). *Aratdar* value

added costs were highest among the intermediates, followed by retailer value added costs. Therefore, the cost of the item will increase as the value chain's frequency of intermediaries increases. The majority of the expenditures associated with adding value to a product are related to transportation, which can be readily reduced by eliminating intermediaries from the value chain. There were also certain unforeseen expenses, including tips and contributions, bazar toll, and these might be easily reduced by following marketing standards and regulations.

Discussion

The idea value chain analysis has partly emerged as the synonym of market analysis. It focuses on the exploration of the actors who are horizontally locked in an interdependent and transactional relationship for constructing and reaching the finally consumable product or service in the end market. The chain as a whole and the particular transaction node in the chain are subject to different rules, norms and enforcement mechanisms in different institutional and spatial levels. In the developing countries, the majority of poverty reduction and regional development policies are focused on improving agricultural productivity and encouraging market access and smallholder farmers' entry into structured market exchanges. Our analysis of the agroforestry value chain has explored the actors and their roles in the value chain, value accumulation nodes, and respective concentration of value (expressed in the cost=income terms) in the chain nodes. This study has been enriched with an analysis of network and value-added structure study of various intermediary types along with an understanding of how this channel works. Our analysis has explored a wide array of the intermediary actors with specific functionalities and complex interrelations which is not outwardly comprehensible for a seemingly simple and localized value chain like agroforestry value chain. Role of the actors, their alignments, and their economic rent seeking capacity (Dalemans et al., 2019) are found to be clearly distinctive in the case of wood segment and crop segment of the agroforestry value chain we have studied. In case of agroforestry crops, the structural part of the value chain is consisted of six actors while the most expanded and populated span of the structure incorporates the intermediary network consisted of *phoria* (middleman), *bepary* (trader), *paiker* (wholesaler) or *aratdar* (keeper of a warehouse) and retailer. This intermediary network connects the farmer in the upstream and consumers in different locations in the downstream. Economic rent seeking behavior of the intermediaries takes place more in the agroforestry crop value chain due to higher intensity of the intermediaries with varying degree of value generation in their respective nodes (Kistruck et al., 2013). Shorter span and less populated intermediary network, in case of agroforestry wood value chain in *Dumuria* Upazila, is associated with less rent seeking in this particular chain.

Agroforestry value chain in *Dumuria* Upazila in Khulna reveals the typical market power concentration among the intermediaries, which is a typical feature of the agricultural and natural resources value chains in the developing countries in particular. Market power emerges from asymmetric possession of end-market knowledge, strategic position in the market network, and investment capability. In crop and wood value chain *Paikar* and *Aratdars* (large wholesale buyers and warehouse keepers who are the connected to the downstream of the respective value chains) have appeared to be the most powerful actor who have determinant influence of market supply and price. Such power of them is associated with their experiential expert knowledge about the product, market networking and relations management capability, large buying capacity, inventory management and hoarding capability. Besides this, the farmers/homesteads are typical price takers in this value chain without significant bargaining power. This is due to their smaller and fragmented nature of farming and small size of the individual output cut off their bargaining capacity as no individual farmer/homestead can influence market supply. Individual famers/homesteads don't have capability and skills for product grading, inventory carrying and management, and coordinating and networking with the end market. This is a typical position of the farmers/homesteads in the agricultural and agroforestry value chain. Intermediaries have the demand, product, distribution, and the network management capabilities in terms of appropriate skills, investment, and risk assumption. In particular, *Bepari,* in the agroforestry crop value chain in *Dumuria* Upazila*,* appears to be the largest rent seeker in this value chain. The prevalence of retailers in the crop value chain is consistence with the nature of consumers market of unprocessed agricultural food items. For more democratization of the gain and welfare distribution in the agricultural and smallholder dominated agroforestry value chain, upgrading of the farmers/homesteads in terms of their product customization, demand management and networking capability can help shedding of the purer rent seeker intermediaries in the value chain. Development of farmer/homestead agroforestry networks, in the form of cooperatives, in *Dumuria* Upazila can work as a primary-level intervention mechanism. Farmers/homestead

cooperatives has been proven successful in upgrading and capacity building in the agroforestry value chain as well as democratizing the value chain both in the developed and developing country context (Poole & Donovan, 2014; Schoneveld, 2022). Pro-market redefinition of the role of the intermediaries may led to restructuring the existing agroforestry value chain in Bangladesh. This study in *Dumuri*a Upazila is a typical representative study of agroforestry value chain in Bangladesh, which can help in democratizing the value chain through rationalizing the economic rent and gain among the participants in the value chain based on their measurable and quantifiable contributions in the value buildup. Such redefinition of the intermediaries requires policy interventions (Thiele et al., 2011; Tseng & Shang, 2021) as well as participatory integration of value innovation focused market actors including large processing and manufacturing industries and retailers (Rossi et al., 2019).

Conclusion

Analysis of the agroforestry value chain in *Dumuria* Upazila in Khulna in Bangladesh reveals the structure and issues typical to similar value chains in similar other developing countries. Analysis of such simple value chains is important as the downstream of such value chains have stronger local and regional embeddedness. Local economic development and social upgrading is highly linked with the functioning and developmental quality of such value chains. Poverty reduction and strengthening the social safety nets in the developing countries are linked with pro-market and pro-poor value chain development. Rationalization of agroforestry, value chain may work as high-potential supplemental intervention in this regard along with development of other major industrial and natural resources value chains. Analysis of the agroforestry value chain in this case reveals the strategic and policy infliction points for realizing the pro-poor value chain development focused approach of local and regional economic development. Appropriate policy framework and engagement of the local government in agroforestry value chain facilitation may include value chain financing arrangement and infrastructure facilitation in the form of warehousing facility development. This paper was primarily focused on a case-specific exploration of the structure, actors, relational dynamics, and patterns of value aggregation in the agroforestry value chain. Findings and learning of this research mark the areas for further research on the exploration the types social and institutional innovations for development of inclusive and sustainable agroforestry value chain, governance mechanism for democratizing the agroforestry value chain for sustainable regional development, and identification of the required capabilities and ways of capacity building in the downstream of the agroforestry value chain for competitiveness development of the smallholders.

Conflict of Interests

The authors declare no conflict of interest.

References

Agbevade, A. (2018). Local economic development strategies and challenges: A comparative empirical evidence from Ghana's local governance system. Journal of Public Administration and Governance, 8(4), 110-126. https://doi.org/10.5296/jpag.v8i4.13894

Ali, M.M., & Islam, A.M. (2013). Developing agribusiness strategies for Bangladesh: an analysis. AIUB Bus Econ Working Paper Series No 2011-01, http://orp.aiub.edu/abewps-2011

Alam, M., Olivier, A., Paquette, A., Dupras, J., Revéret, J.-P., & Messier, C. (2014). A general framework for the quantification and valuation of ecosystem services of tree-based intercropping systems. *Agroforestry System, 88*(4), 679-691. https://doi.org/10.1007/s10457-014-9681-x

Asogwa, B.C., & Okwoche, V.A. (2012). Marketing of agricultural produce among rural farm household in Nigeria: the case of Sorghum marketing in Benue State. *International Journal of Business and Social Science, 3*(13), 269-277.

Bair, J. (2008). Analysing global economic organization: embedded networks and global chains compared. *Economy and Society*, *37*(3), 339-364. http://dx.doi.org/10.1080/03085140802172664

Barrientos, S., Knorringa, P., Evers, B., Visser, M., & Opondo, M. (2015). Shifting regional dynamics of global value chains: Implications for economic and social upgrading in African horticulture. *Environment and Planning A: Economy and Space*, *48*(7), 1266-1283. https://doi.org/10.1177/0308518X15614416

Burgess, P.J., Crous-Duran, J., den-Herder, M., Dupraz, C., Fagerholm, N., Freese, D., Garnett, K., Graves, A.R., Hermansen, J.E., Liagre, F., Mirck, J., Moreno, G., Mosquera-Losada, M.R., Palma, J.H.N., Pantera, A., Plieninger, T., & Upson, M. (2015). AGFORWARD Project Periodic Report: January to December 2014. Cranfield University: AGFORWARD. 95 pp. http://www.agforward.eu/index.php/en/news-reader/id-27-february-2015.html. Accessed 16 March 2018.

Chakraborty, M., Haider, M.Z., & Rahaman, M.M. (2015). Socio-economic impact of cropland agroforestry: evidence from Jessore District of Bangladesh. *International Journal of Agricultural Research, Innovation and Technology, 2*(1), 11–20.

Chavan, S.B., Keerthika, A., Dhyani, S.K., Handa, A.K., Newaj, R., & Rajarajan, K. (2015). National agroforestry policy in India: a low hanging fruit. *Current Science, 108*(10), 1826-1834.

Collier, Z.A., Connelly, E.B., Polmateer, T.L., & Lambert, J.H. (2017). Value chain for next-generation biofuels: Resilience and sustainability of the product life cycle. *Environment Systems and Decisions*, *37*(1), 22-33. https://doi.org/10.1007/s10669-016-9618-1

Dalemans, F., Muys, B., & Maertens, M. (2019). A framework for profitability evaluation of agroforestry-based biofuel value chains: An application to pongamia in India. *GCB Bioenergy*, *11*(7), 852-870. https://doi.org/10.1111/gcbb.12605

Dhital, R. (2004). Rural urban agriculture marketing system: challenges and opportunities: a case study: Eastern Nepal. Dissertation, School of Forestry and Environmental Studies, Yale University, USA.

Fernández, V.R. (2015). Global value chains in global political networks: tool for development or neoliberal device? *Review of Radical Political Economics*, *47*(2), 209-230. http://dx.doi.org/10.1177/0486613414532769

Foysal, A.M., Hossain, M.L., Rubaiyat, A., & Hasan, M.B. (2013). Economics of homestead forestry and their management activities at Fatickchari Upazila of Chittagong district. *Agriculture Forestry and Fisheries, 2*(4), 161-176. http://dx.doi.org/10.11648/j.aff.20130204.12

Garrett, L.E., Spreitzer, G.M., & Bacevice, P.A. (2017). Co-constructing a Sense of Community at Work: The Emergence of Community in Coworking Spaces. *European Group for Organization Studies, 38*(6). https://doi.org/10.1177/0170840616685354

Gereffi, G., & Fernandez-Stark, K. (2016). Global Value Chain Analysis: A Primer, 2nd Edition. Retrieved from https://hdl.handle.net/10161/12488

Gereffi, G., & Lee, J. (2016). Economic and social upgrading in global value chains and industrial clusters: Why governance matters. *Journal of business ethics*, *133*(1), 25-38. https://ssrn.com/abstract=2721292

Havet, A., Coquil, X., Fiorelli, J.L., Gibon, A., Martel, G., Roche, B., Ryschawy, J., Schaller, N., & Dedieu, B. (2014). *Agriculture, Ecosystems & Environment, 190*, 120-127. https://doi.org/10.1016/J.AGEE.2014.01.009

Huda, K.N., Karim, M.R., & Khan, R.S. (2012). An empirical study on competitive distribution management of tea brands in Bangladesh. *International Journal of Marketing Studies, 4(*5), 99-107. http://dx.doi.org/10.5539/ijms.v4n5p99

Ibrahim, K., Wadud, M.A., Mondol, M.A., Alam, Z., & Rahman, G.M.M. (2011). Impact of agroforestry practices on livelihood improvement of the farmers of char Kalibari area of Mymensingh. *Journal of Agroforestry and Environment, 5*(2), 77–80.

Islam, K.K., & Noriko, S. (2012). Deforestation, land conversion and illegal logging in Bangladesh: The case of the Sal forests. *iForest-Biogeoscience and Forestry, 5*(3), 171-178. Technical Report - doi: 10.3832/ifor0578-005

Islam, K.K., Rahman, G.M., Fujiwara, T., & Noriko, S. (2013). People's participation in forest conservation and livelihoods improvements: Experience from a forestry project in *Bangladesh. International Journal of Biodiversity Science & Management, 9*(1), 30-43. https://doi.org/10.1080/21513732.2012.748692

Islam, K.K., Ullah, M.O., Hoogstra, M., & Noriko, S. (2012). Economic contribution of participatory Agroforestry program to poverty alleviation: a case from Sal forests Bangladesh. *Journal of Forestry Research, 23*(2), 323-332. https://doi.org/10.1007/s11676-012-0260-6

Islam, K.K., Fujiwara, T., Sato, N., & Hyakumura, K. (2018). Evolving and strengthening the cooperative approach for agroforestry farmers in Bangladesh: Lessons learned from the Shimogo cooperative in Japan. *Sustainability*, *10*(3), 617. https://doi.org/10.3390/su10030617

Jahan, M.S., & Rahman, M.Z. (2012). Agroforestry Sustains Agricultural Development through Efficient Land-use Systems. *International Journal of Sustainable Development, 3*(11), 43-50. https://ssrn.com/abstract=2047817

Kano, L., Tsang, E. W., & Yeung, H.W.C. (2020). Global value chains: A review of the multi-disciplinary literature. *Journal of international business studies*, *51*(4), 577-622. https://doi.org/10.1057/s41267-020-00304-2

Kaplinsky, R., & Morris, M. (2000). *A Handbook for Value Chain Research*. Prepared for International Development Research Centre (IDRC) (Part 1).

Kaplinsky, R. (2004). Spreading the gains from globalization: what can be learned from value-chain analysis? *Problems of economic transition*, *47*(2), 74-115.

Kirimi, L., Sitoko, N., Jayne, T.S., Karin, F., Muyanga, M., Sheahan, M., Flock, F., & Bor, G.G.A. (2014). Farm Gate-To-Consumer Value Chain Analysis of Kenya's Maize Marketing System. MSU International Development Working Paper No 111, 2011.

Kistruck, G.M., Beamish, P.W., Qureshi, I., & Sutter, C.J. (2013). Social intermediation in base-of-the-pyramid markets. *Journal of Management Studies*, *50*(1), 31-66. http://dx.doi.org/10.1111/j.1467-6486.2012.01076.x

Leakey, R. (1996). Definition of agroforestry revisited. *Agroforestry today*, *8*, 5-5.

Lovell, S.T., DeSantis, S., Nathan, C.A., Olson, M.B., Ernesto-Méndez, V., Kominami, H.C., Erickson, D.L., Morris, K.S., & Morris, W.B. (2010). Integrating agroecology and landscape multifunctionality in Vermont: an evolving framework to evaluate the design of agroecosystems. *Agricultural System, 103*(5), 327-341. https://doi.org/10.1016/J.AGSY.2010.03.003

Matin, M.A., Baset, M.A., Alam, Q.M., Karim, M.R., & Hasan, M.R. (2008). Mango marketing system in selected areas of Bangladesh. *Bangladesh Journal of Agricultural Research, 33*(3), 427-438. https://doi.org/10.3329/BJAR.V33I3.1602

Mishra, P.K., & Dey, K. (2018). Governance of agricultural value chains: Coordination, control and safeguarding. *Journal of Rural Studies*, *64*, 135-147. http://dx.doi.org/10.1016/j.jrurstud.2018.09.020

Moraine, M., Duru, M., Nicholas, P., Leterme, P., & Therond, O. (2014). Farming system design for innovative crop-livestock integration in Europe. *Animal, 8*(8), 1204–1217. doi:10.1017/S1751731114001189

Muhammed, N., Koike, M., Haque, F., & Miah, M.D. (2008). Quantitative assessment of people-oriented forestry in Bangladesh: A case study from Tangail Forest Division. *Journal of Environmental Management, 88*(1), 83-92. http://dx.doi.org/10.1016/j.jenvman.2007.01.029

Nagurney, A. (2006). On the relationship between supply chain and transportation network equilibria: A supernetwork equivalence with computations. *Transportation Research Part E Logistics and Transportation Review, 42*(4), 293-316. http://dx.doi.org/10.1016/j.tre.2005.02.001

Phelps, N.A, Neilson, J., & Pritchard, B. (2011). Value Chain Struggles: Institutions and Governance in the Plantation Districts of South India. *Singapore Journal of Tropical Geography, 32*(2), 272–273. http://dx.doi.org/10.1111/j.1467-9493.2011.00425_4.x

Pike, A., Rodríguez-Pose, A., & Tomaney, J. (2007). What kind of local and regional development and for whom? *Regional Studies, 41*(9). http://dx.doi.org/10.1080/00343400701543355

Ponte, S., & Gibbon, P. (2005). Quality standards, conventions and the governance of global value chains. *Economy and society*, *34*(1), 1-31. http://dx.doi.org/10.1080/0308514042000329315

Ponte, S., & Sturgeon, T. (2014). Explaining governance in global value chains: A modular theory-building effort. *Review of international political economy*, *21*(1), 195-223. https://doi.org/10.1080/09692290.2013.809596

Poole, N., & Donovan, J. (2014). Building cooperative capacity: the specialty coffee sector in Nicaragua. *Journal of Agribusiness in Developing and Emerging Economies, 4*(2), 133-156. https://doi.org/10.1108/JADEE-01-2013-0002

Power, A.G. (2010). Ecosystem services and agriculture: tradeoffs and synergies *Philosophical Transactions of the Royal Society B, 365*(1554), 2959-2971, https://doi.org/10.1098/rstb.2010.0143

Rahman, S.A., Imam, M.H., Snelder, D.J., & Sunderland, T. (2012). Agroforestry for livelihood security in Agrarian landscapes of the Padma floodplain in Bangladesh. *Small-scale Forestry, 11*(4), 529–538. https://doi.org/10.1007/s11842-012-9198-y

Raihan, S., & Ahmed, M. (2008). Service trade liberation and domestic regulation: perspective from Bangladesh. MPRA (Munich Personal RePEc Archive) Paper No. 37896.

Rossi, A., Bui, S., & Marsden, T. (2019). Redefining power relations in agrifood systems. *Journal of Rural Studies*, *68*, 147-158. https://doi.org/10.1016/j.jrurstud.2019.01.002

Röhrig, N., Hassler, M., & Roesler, T. (2020). Capturing the value of ecosystem services from silvopastoral systems: Perceptions from selected Italian farms. *Ecosystem Services, 44,* 101152, https://doi.org/10.1016/j.ecoser.2020.101152

Safa, M.S. (2004). The effect of participatory forest management on the livelihood of the settlers in a rehabilitation program of degraded forest in Bangladesh. *Small-scale Forest Economics, Management and Policy, 3*(2), 223- 238. https://doi.org/10.1007/s11842-004-0016-z

Saarelainen, E., & Sievers, M. (2011). Combining Value Chain Development and Local Economic Development, ILO Value Chain Development Briefing Paper 1, Geneva: ILO.

Sarker, D., & Ghosh, B.K. (2010). Milk marketing under cooperative and no-cooperative marketing channels: experiences from West Bengal. *Economic Annals, 55*(187), 87-108. http://dx.doi.org/10.2298/EKA1087087S

Schoneveld, G.C. (2022). Transforming food systems through inclusive agribusiness. *World Development*, *158*, 105970. https://doi.org/10.1016/j.worlddev.2022.105970

Scoones, I. (1998). Sustainable Rural Livelihoods: A Framework for Analysis. IDS Working Paper 72.

Sharmin, A., & Rabbi, S.A. (2016). Assessment of farmers' perception of agroforestry practices in Jhenaidah District of Bangladesh. *Journal of Agriculture and Ecology Research, 6*(4), 1–10. http://dx.doi.org/10.9734/JAERI/2016/21760

Singha, S., Uddin, M.S., Banik, S.C., Goswami, B.K., & Kashem, M.A. (2019). Impact of Homestead Agroforestry on Socio-economic Condition of the Respondents at Kamalganj Upazila of Moulvibazar District in Bangladesh. *Asian Journal of Research in Agricultural and Forestry,3*(1),1-9. http://dx.doi.org/10.9734/ajraf/2019/v3i130030

Stoian, D., Donovan, J., Fisk, J., & Muldoon, M.F. (2012). Value chain development for rural poverty reduction: a reality check and a warning. *Enterprise Development and Microfinance, 23*(1), 54–69. http://dx.doi.org/10.3362/1755-1986.2012.006

Thiele, G., Devaux, A., Reinoso, I., Pico, H., Montesdeoca, F., Pumisacho, M., & Horton, D. (2011). Multi-stakeholder platforms for linking small farmers to value chains: evidence from the Andes. *International Journal of Agricultural Sustainability*, *9*(3), 423-433. http://dx.doi.org/10.1080/14735903.2011.589206

Tseng, C.T., & Shang, S.S. (2021). Exploring the sustainability of the intermediary role in blockchain. *Sustainability*, *13*(4), 1936. http://dx.doi.org/10.3390/su13041936

United Nations Development Programme (2012). The Africa human development report 2012: building a food secure future. New York, NY.

UNIDO (2011). *Pro-poor Value Chain Development: 25 guiding questions for designing and implementing agroindustry projects.* United Nations Industrial Development Organization (UNIDO). Vienna, Austria.

World Bank (2003). Local Economic Development a Primer: Developing and Implementing Local Economic Development Strategies and Action Plans, Washington D.C., USA.

World Bank (2016). Annual report of World Bank. Washington D.C., USA.

Wong, G., Greenhalgh, T., Westhorp, G., Buckingham, J., & Pawson, R. (2013). RAMESES publication standards: meta-narrative reviews. *Journal of Advanced Nursing,11*(1), 1-15. https://doi.org/10.1111/jan.12092