

Article

Evolving and Strengthening the Cooperative Approach for Agroforestry Farmers in Bangladesh: Lessons Learned from the Shimogo Cooperative in Japan

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Abstract: Although an agro-based country, the farmers of Bangladesh do not receive significant returns from their products, due to some obstacles blocking the achievement of this ultimate goal. This study tries to identify the major challenges of the agroforestry product supply chains in Bangladesh, and offer an alternative solution through the involvement and experiences of farmer cooperatives within a Japanese cooperative model. The objectives were outfitted by two case studies, and the Bangladesh case clearly showed that the involvement of many intermediaries in agroforestry product supply chains was one of the main obstacles that stunted the outcomes of the agroforestry programs. The intermediaries have maximized their profit by buying the farmer products at low prices and selling them back at higher prices, which resulted in high marketing margins. Meanwhile, the Japanese case study had articulated that the farmer-driven cooperative approach, with its good marketing strategies and service functions, could successfully eliminate the intermediaries' involvement in farmer products, and make a cooperative a strong economic organization. Despite a few challenges, the farmer-driven Japanese cooperative approach would be a good solution that could tackle the middleman problem, and make agroforestry a sustainable production system in Bangladesh.

Keywords: farmer cooperative; marketing channel; intermediaries; production systems; Asia

1. Introduction

Bangladesh agriculture is dominated by small-scale farming; more than 77% of people are directly or indirectly involved in agriculture, and a good portion of the country's GDP (16.33%) comes from the agricultural sector [1–3]. Being a densely populated and limited resource-based country, small-scale farmers in Bangladesh are more interested in practicing agroforestry in order to produce more integrated, diverse, and profitable products. Due to a vast demand of forest products in local markets, agroforestry practices are gaining preference in Bangladesh [4–6]. Agroforestry programs that involve local farmers in planting tree species with a combination of agricultural crops on the same piece of degraded forestland have already had positive impacts on local communities by reducing poverty and improving livelihood [4,6]. They are important sources of household income for farmers, and also play a crucial role in diminishing the impact of natural hazards and provide a number of other environmental services. The agroforestry programs in different deforested areas of Bangladesh

have already been considered environmentally-friendly and income-generating programs for people who are dependent on forests [7–9].

The Bangladesh Forest Department started agroforestry programs in the form of participatory approaches at the Madhupur Sal forests area in 1989, and so far, these programs have been well accepted, and have involved more than 3000 local farmers [9]. In these programs, farmers have opportunities to produce agricultural crops such as pineapple (*Ananas comosus*), turmeric (*Curcuma longa*), ginger (*Zingiber officinalis*), aroid (*Colocasia spp.*), etc. along fast-growing firewood-producing tree species (e.g., *Acacia auriculiformis*) in the degraded Sal forestland. Since their implementation, these programs have been considered some of the most popular and income-generating agroforestry programs that improve the livelihood of the forest-dependent people in Madhupur [9]. On the contrary, the organization and management of farmer groups or associations has been very poor among agroforestry farmers in Bangladesh [9]. In another study, Islam et al. (2015) identified 19 different types of actors that characterize the agroforestry programs, due to the wide variety of economic and ecological benefits that the programs deliver. Islam et al. (2015) also mentioned that some of the actors (acting as intermediaries) have directly exploited the product supply chain in order to get economic benefit from the agroforestry programs. As an agroforestry product goes from farmer to consumer, a number of interactions take place along a chain of interconnected activities, and value is added continuously at each level of the chain [10]. The production, standardization, pricing, and distribution of local products are progressively organized into supply chains, where the movements of products have affected farmers, wholesalers, retailers, and other intermediaries involved in that chain. Researchers have also mentioned that farmer voices were totally ignored in the complex intermediary-based marketing systems of Bangladesh [8,9,11–15].

Farmer organizations in the name of different cooperative societies are not new to Bangladesh, and such types of organizations have been involved in a few agricultural products (e.g., dairy cooperative products such as ‘Milk Vita’). In their report on Bangladesh, the Food and Agriculture Organization mentioned that some farmer organizations were formed in the agriculture sector with the direct support of government extension agencies and non-governmental organizations (NGOs), and that the continuations of those organizations were not satisfactory [2]. The farmer-driven and farmer-controlled cooperative organizations were not involved in the agroforestry sector in Bangladesh [16]. On the contrary, a farmer cooperative is a legal practical entity by which a group of farmers perse to enhance their economic outcome in a competitive society [17]. It is already established that cooperative organizations have played significant roles in small-scale farming and agriculture development, as well as uplifting members’ livelihood, and there are plenty of examples of this throughout the world [12,17–21]. Japan is one of the leading countries in the world that has developed its agricultural sector through farmers’ cooperative movements.

Japanese Agricultural Cooperatives, which are locally called as *Nokyo* or JA, are probably the largest small-scale farmer-based organizations in the world [20]. Japanese *Nokyo* are different in many aspects—including their organizational, services, functional, and welfare aspects—and are treated as unique organizations as a result. After World War II, agricultural cooperatives were at the forefront of restructuring the Japanese rural economy through their significant contribution to the agricultural sector [20,22–26]. Nowadays, JAs are some of the strongest economic and financially capable organizations in Japan. Although JAs have some challenges, the marketing strategies and organization of JAs can offer experience to other countries whose agriculture is developing, and whose local markets are controlled by different intermediaries. The literature has also revealed that most farmer-driven ideal cooperative examples can be found in Japan, which have provided a broad range of economic and social services. Japanese agricultural cooperatives have also evolved as unique and self-sufficient organizations with their own internal marketing channels and other service functions. On the contrary, Bangladeshi agroforestry farmers and their marketing systems face a number of complexities led by intermediary-related problems. The agroforestry farmers of Bangladesh will eventually need examples and lessons so that they can overcome problems by themselves. Within this

perspective, the study would like to draw on lessons learnt from the farmer-driven well-developed cooperative experiences of Japan. Therefore, the objectives of this study are to explore the major challenges of agroforestry practices and their product supply chains in Bangladesh, and also provide an alternative solution through the immersion of farmer cooperatives within the practical experiences of Japanese cooperative movements.

2. Methods and Materials

2.1. Conceptual and Theoretical Frameworks

Cooperatives can be interpreted in different ways, and in general, a cooperative is a member-owned, member-controlled business that distributes benefits on the basis of use. The study would like to conceptualize the agriculture-based farmer cooperative organization. The farmer cooperative simply refers to a business organization that plays a significant role by way of different services (e.g., credit, equity, information), function (e.g., product buying and selling, transportation, storage, grading) and welfare (e.g., health care, education) [17,18]. That means that a farmer cooperative is a legal and institutional body that enables the collective action of its own members, who can then collectively compete within the context of other types of business organizations. Here, the important thing is that the ownership and control of the enterprise must be in the hands of farmers who utilize this service. Therefore, a farmer cooperative is an organization that is owned and controlled by the people who use its services, functions, and welfare [16,27,28]. An ideal cooperative in the agriculture sector may form by the farmers/producers as a business organization and, at the same time, provide different functions and welfare as per the needs of farmers (Figure 1), which is the main focus of this study.

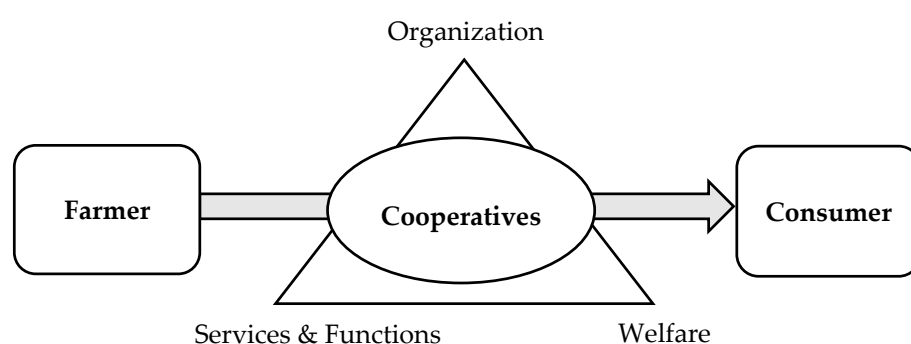


Figure 1. Generic structure of an ideal farmer cooperative.

The study used two particular case studies from Bangladesh and Japan in order to understand the farmer cooperative systems and accomplish the research objectives.

2.2. Madhupur Agroforestry Case of Bangladesh

Madhupur Garh (also called Track) is located at the central and northwestern parts of Bangladesh, consisting of Mymensingh and Tangail districts (Figure 2). Madhupur Garh is famous for its moist deciduous Sal forests, which are dominated by the profitable Sal (*Shorea robusta*) tree [11,29]; it is also known for growing agricultural crops. Moreover, the majority of the Bangladesh Sal forest is located at the Madhupur Garh (owned by the government), which is also treated as the most threatened and degraded ecosystem of Bangladesh [6–8,12]. Almost two-thirds of the original forests covering Madhupur Garh were deforested and converted for agriculture and other purposes [9,30]. The Bangladeshi government started different participatory forest management approaches such as agroforestry at the encroached forest area of Madhupur Garh in 1989 [6,8,9,12]. Agroforestry practices were already very popular, and well-established programs existed in Madhupur Garh; therefore,

the case study was conducted at Madhupur Garh, and covered all of the agroforestry approaches that are practiced by local farmers (hereafter called participants) (Figure 2).

In their agroforestry program, each participant was allocated one hectare of deforested land, where they practiced an agroforestry model that consisted of a fast-growing tree species (e.g., *Acacia auriculiformis*) as well as agricultural crops. Traditionally, Madhupur Garh is famous for cultivating different types of food crops due to its nutrient-rich soil and favorable climatic conditions [9]. A participant could continue agroforestry practices for three rotations (one rotation is a 10-year cycle) if he/she followed the program criteria properly. The forest department and participants shared the benefit of tree-harvest outputs at a rate of 45%:45%, and the remaining 10% of benefits were reserved for the future through the tree farming fund. Furthermore, participants were allowed to grow annual/perennial crops with a combination of trees at any time in the 10-year rotation cycle, and all of the crop benefits belonged to the participants. The food crops grown in Madhupur Garh (e.g., pineapple, turmeric, ginger, aroid, etc.) are economically profitable, and very popular throughout Bangladesh. In these agroforestry programs, farmers were more interested in cultivating agricultural crops, and the total crop income was much higher than the tree income [9]. Accordingly, the participatory agroforestry programs already included 3327 farmers in the Madhupur area, and a number of farmers were applying to be included the program.

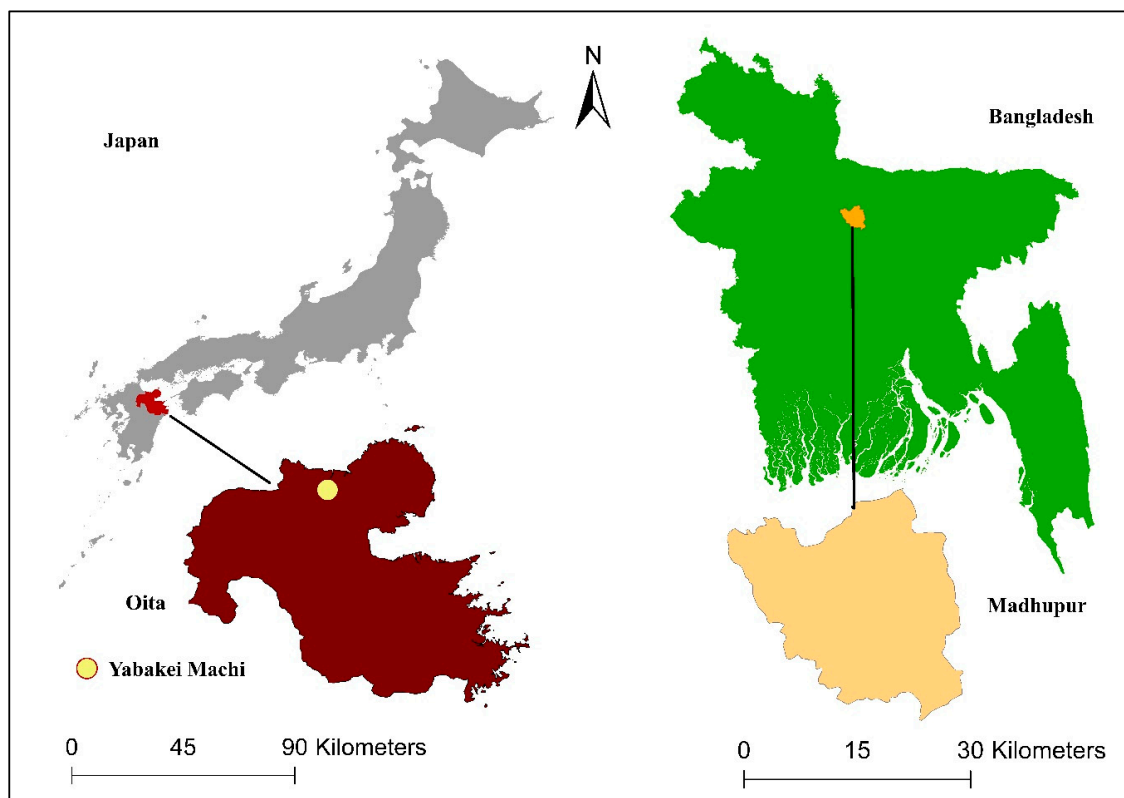


Figure 2. Map of the study areas indicating the Yabakei town of Japan and Madhupur Garh of Bangladesh.

2.3. Oita Cooperative Case of Japan

Kyushu, the southern island of Japan, is famous for its different types of agricultural cooperatives. Moreover, Kyushu Island is located in a temperate zone with a humid sub-tropical climate that produces a variety of agricultural products. Oita prefecture in Kyushu Island is also known for different types of farmer cooperative organizations. In addition, farmers were the main decision-makers in Japanese cooperative organizations. The case study focused on a farmer-driven small-scale

Shimogo cooperative organization that is located in a remote area of Yabakeimachi of Nakatsu City in Oita Prefecture, Japan (Figure 2). Shimogo was established in 1948 with an initial saving of 108 households (out of 300 households) living in the Yabakeimachi area. At present, 358 full-time members, and 28 permanent staff are running the Shimogo cooperative organization. However, most of the member farmers were marginal land owners who depended on agriculture for their livelihoods (according to the Shimogo coop head). There are also 566 part-time members in the coop who do not have voting and decision making-power. However, the majority of the coop staff does farming activities together with administrative duties, and receives salaries from the income of the coop. The Shimogo farmers are categorized into seven different producer groups (e.g., Vegetable, Rice/Cereals, Milk, Dairy, Pig, Chicken, and Tea), and each group has their own representative bodies who manage the cooperative.

2.4. Data Collection and Analysis

Both of the case studies rely on different techniques of data collection, as well as secondary literature, for summing up the findings. This study collected both primary and secondary data through different techniques. Primary data collection techniques were comprised of household surveys and semi-structured interviews with local farmers involved in cooperatives, forest department staff, and cooperative staff, as well as expert opinions, focus group discussions, and practical observations. On the other hand, secondary data were collected through different reliable sources such as local reports, documents, publications, online materials, meeting minutes, etc. In the case of Bangladesh, primary data were collected several times from 2013 to 2016, and for the Japanese case, data were collected from 2014 to 2017. In both cases, data were collected with the help of Japanese and Bangladeshi researchers. For household surveys with semi-structured questionnaires in Bangladesh, we first collected the list of total participants and their basic information from the local forest office, and randomly selected 120 agroforestry farmers. The sample population covered all of the Madgupur area, and included local agroforestry farmers only. In the case of Japan, the study initially collected participants' information from the head of the Shimogo coop, and selected 20 different farmers as a purposive sampling technique. That means the head of the coop assisted us with selecting the sample in order to have more representation and obtain wider information. It was mentioned here that our research team needed to confirm prior appointments in order to interview Japanese coop farmers. Both of the Bangladeshi and Japanese sample populations were comprised of men and women, and different types of farmers (producing different products). The agroforestry program of Bangladesh included less than 10% women participants [9]. However, this study selected 22 women (20%) out of a total of 120 interviewees, and in the Japanese case, 40% of the face-to-face interviews were women. We used different survey questionnaires for the collection of data in Bangladesh and Japan; these questionnaires were mainly focused on demographic features, household and agroforestry income, agriculture and forestry activities, the production of food crops, intermediary involvement, major constraints, product cultivation costs, the price determination of products, marketing channels of the farmer products, service and functions provided by the coop (Japan case), credits, extension and collaboration, etc.

The study also interviewed the head of the Shimogo coop and his five official staff; these interviews focused on organizational, service, and functional issues. Interviews were conducted with the help of a five-member research team in Bangladesh and a four member-team in Japan. The study visited local markets and only two urban markets in the Madhupur area of Bangladesh, and interviewed 10 consumers in order to determine the final price of agroforestry products. The research team also visited two Seikyou (departmental shops) in the Yabake area of Oita, Japan. All of the Japanese data and materials were translated into English with the help of three expert members. Finally, the primary and secondary data collected from different sources were tabulated and entered into MS-EXCEL 2013 for the calculation of descriptive statistics, and different tables were prepared using the collected data.

3. Results and Discussion

3.1. Problem Analysis of Agroforestry in Bangladesh

Participating agroforestry programs in the Madhupur Garh of Bangladesh have already proven to be representative examples that improve the livelihood of smallholders and conserve natural resources [5,7–9,16,30]. However, this study also found some limiting factors that were hindering the outcomes of agroforestry programs, such as the involvement of intermediaries at different levels of agroforestry production and marketing channels, which was the leading limiting factor. The majority of farmers (98%) mentioned that intermediaries exploited local agroforestry production and marketing systems, and their interference mainly impeded the economic output of farmers (Table 1).

Table 1. Major issues faced by Bangladeshi farmers in the Madhupur Sal forest area ($N = 120$).

Rank Order	Problems	Issues in Brief	Freq. (% of Farmer)
1	Involvement of many intermediaries	Different middlemen involved in marketing of agroforestry products and the supply chain	117 (98)
2	Bureaucratic and official complexity	Complexity and unexpected delays created by the Forest Department staff to initiate Agroforestry programs	95 (79)
3	Lack of alternative market facilities	No other suitable market in the local area	92 (77)
4	Lack of easy credit or loan facilities	Government and Non-government organizations do not provide interest-free or low-interest loans	76 (63)
5	Poor road communication	Often transporting of AF products to the market faced muddy and poor road infrastructure	74 (62)
6	Lack of healthy seeds, fertilizers, and pesticides	Unavailability of improved input materials for the local farmers	69 (58)
7	Local leader/elite interference	Getting undue benefit from the agroforestry programs	52 (43)
8	Lack of information and research	No research and information facilities for the local farmers	36 (30)

In another study, Islam et al. (2010, 2012b) mentioned that bureaucracy, together with a lack of training and loan facilities and poor road structure, severely affected the success of agroforestry programs in Bangladesh. Besides the intermediary problem, 79% of farmers mentioned the bureaucratic problem made by the FD staff. The bureaucratic problems started at the time of getting agroforestry land in bilateral agreements. Conversely, the FD staff mentioned that they tried their best to quickly process agreements, but due to some official procedures this took time; they also denied corruption regarding processing. The participants also mentioned the lack of easy or low-interest loan facilities in the study area, and that the area still faced a market monopoly system. Furthermore, a few elites and businessmen controlled the local market, and the local government had no strict monitoring systems to control the market. In addition to these problems, participants also suffered from a lack of healthy seeds, fertilizers, and information, as well as poor road communication systems. On the basis of these farmer statements, our study investigated the intermediaries' involvement and the marketing channels of agroforestry programs in Bangladesh.

3.2. Intermediaries Involved in the Agroforestry Product Supply Chain in Bangladesh

3.2.1. Phoria

Phoria purchased products from farmers and dealt with a small volume of agricultural products such as pineapple, zinger, turmeric, aroid, etc. They sold products in village markets or sold their whole products to the Bepari (Figure 3). Usually, they were small landless farmers/laborers who were not involved in full-time farming [31]. They possessed a small amount of capital, and in some

cases, they contracted farmers before the harvesting of products and gave some money to farmers in advance.

3.2.2. Beparies

Beparies were professional businessmen who purchased products from the agriculture farmers or phoria. They dealt with large amounts of products, and often paid phoria for the advanced purchasing of local products. Mainly, beparies sold their products to paiker/arathdar (Figure 3).

3.2.3. Paiker/Arathdar

Paiker acted as fixed commission agents between beparies and retailers (Figure 3). They were also called wholesalers in some areas. They had the facilities to store the products, and reportedly did tricky business on the additional value added to the products.

3.2.4. Retailer

Retailers were the last level of intermediaries in the agroforestry marketing channel of Bangladesh and other developing countries. They usually handled the consumers, and bought products from paiker or bepary. They had some additional input costs of renting/buying shops and appointing sales staff, and also took the risk regarding damaged/rotten products.

3.2.5. Buyer/Auctioneer

These intermediaries were only observed in agroforestry timber/firewood marketing channels. Buyers mainly took part in the open timber auction process. Some buyers had storage facilities, and could sell timber to the wholesalers or, sometimes, to the retailers (Figure 3). They also maintained a good relationship with FD, local political leaders, and the elite in order to buy products from open auction markets.

3.2.6. Local Firewood Trader

This was a small group of traders who dealt with a small volume of firewood only. Often, they collected firewood from farmers' homes and sold it to wholesalers (Figure 3). They also supplied firewood to the local brickfields. Usually, they had temporary and small storage facilities.

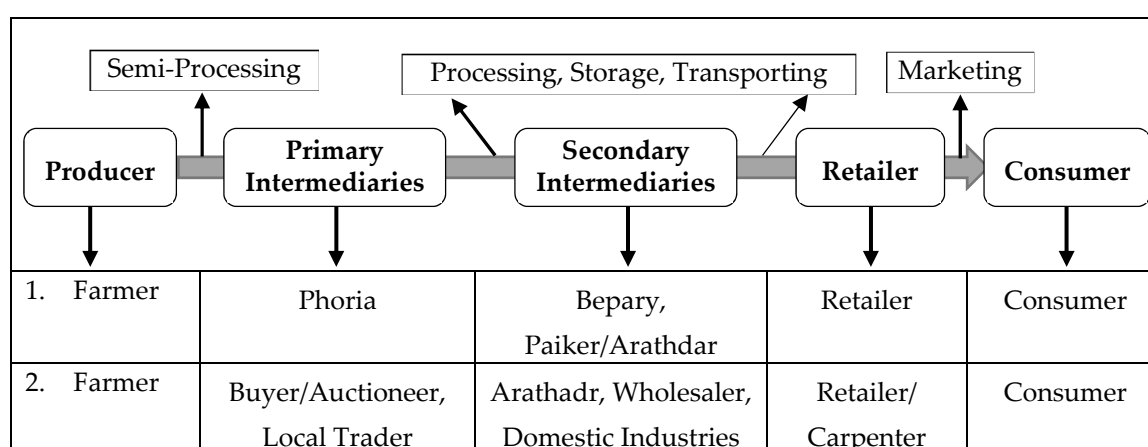


Figure 3. Distribution channel of agroforestry products marketing that involves intermediaries, stakeholders, and processes in Bangladesh. Here, 1 = Agroforestry crop channel; 2 = Agroforestry firewood/timber channel.

3.3. Effects of Intermediaries on Farmer Products

Enormous variations of agroforestry crop (e.g., pineapple) prices were observed in the local and urban markets of Bangladesh in the production season. However, intermediaries were involved in setting a price in order to buy and sell agroforestry crops. Often, farmers faced prefixed prices of their products, such as pineapple or ginger, which were set by the beparies. Nevertheless, beparies negotiated among them, and controlled the initial prices of the agroforestry crops in the local market, which was also reported by Islam and Sato (2012b). Almost 98% of the farmers reported that they did not get their products' minimum prices due to the beparies' coalition. Farmers faced a severe depreciation of selling their pineapple products in the Mahudpur area's local marketing channel in Bangladesh (Figure 4). Surprisingly, the farmers earned only 10 Taka per pineapple in the local market, and it cost only 15 Taka to the consumer if they bought it from the farmer. However, in a normal marketing channel, the consumer had to pay about 40 Taka in a local market, and 50 Taka in a city market, in order to buy the same pineapple (Figure 4).

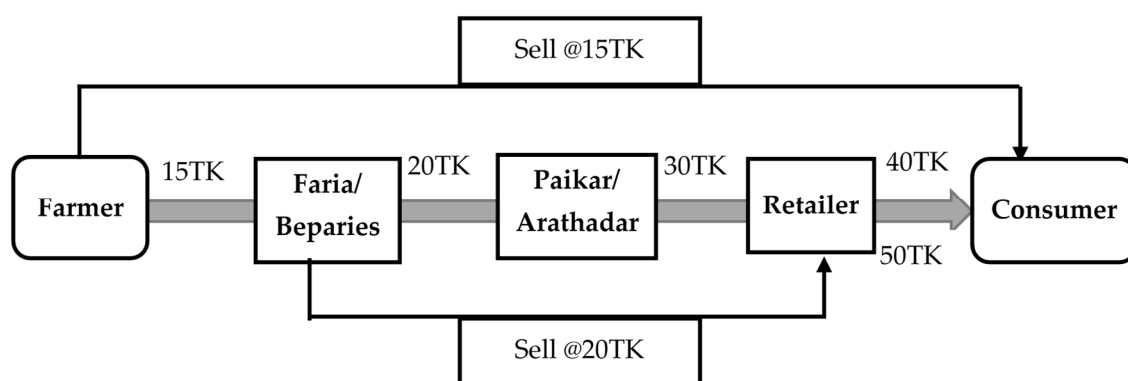


Figure 4. Price of an agroforestry product (pineapple) in the local and urban marketing channels of Bangladesh (1 USD \approx 79 Taka).

The marketing margin could easily explain the differences between the farmer value and the retail price of the agroforestry products. It covered the prices of all of the utilities, adding activities and functions that were performed by the intermediaries [14,17,32]. It can be explained by the deduction of the selling price from the producer price, divided by the selling price, and expressed as a percentage. The common agroforestry crops and their unexpected marketing margin (Table 2) scenario would result in an alarming situation that ultimately affected the farmers and consumers.

Table 2. Marketing margins of common agroforestry products in the Bangladeshi marketing channel.

Produce	Unit	Producer Price (Taka), P	Retail Price (Taka), R	Marketing Margin = $(R - P)/R \times 100$
Pineapple	1 piece	15	40	62.5%
Ginger	1 kg	70	125	44.0%
Turmeric	1 kg	30	45	33.3%
Firewood (Acacia spp.)	1 mon (40 kg)	120	190	36.8%
Firewood (Other spp.)	1 mon (40 kg)	100	175	42.9%

1 USD \approx 79 BDT (local currency).

The results showed that the marketing margins for pineapple, ginger, and turmeric were 62.5%, 44%, and 33.3%, respectively (Table 2). That means an average pineapple marketer earned a market margin (farmer to retail price spread) of 0.63 Taka for every 1 Taka of retail price paid by the end consumer in the marketing system in Bangladesh. This represented payments for all of the marketing charges, including the intermediaries' commissions that were added to farmer products. The reason

for a higher marketing margin in Bangladesh was mainly the higher intervention or exploiting activities of intermediaries [14,15,30]. However, in the case of firewood/timber, the marketing margin was 42.9% for *Acacia* spp. (e.g., *Acacia auriculiformis*, which is the dominant one) and 36.8% for other (e.g., *Gmelina arborea*, *Melia azedarach*, etc.) timber species, respectively (Table 2). So, the variations of farmer and retail prices, especially for agroforestry crops, clearly indicated that farmers received only a minor share of the final retail prices. Empirical evidence to support this finding was very inadequate in Bangladesh; however, Scott (1988) found similar types of results in potato marketing systems in Bangladesh. In mango marketing, Matin et al. (2008) also found a high marketing margin in several markets in Bangladesh. Nevertheless, other developing countries also showed higher marketing margins for agricultural crops [32].

3.4. Way Out of Issues

Major issues of agroforestry practices in Bangladesh clearly illustrated that the farmers were the most underprivileged group of people, and often other intermediaries had stunted the expression of their their collective voice advocating for free and fair access to local markets. In this situation, farmer-based cooperative organizations would resolve certain issues. This was also the opinion of experts. The cooperative concept is not new in Bangladesh, but the application of cooperatives in the agroforestry sector is rare and scarce. The study found only two cooperative associations in the study area, and the main objective of those associations (e.g., the Arunkhola Cooperative Society) was to collect a fixed monthly fee from all of the members. At the beginning of each month, one farmer received the whole amount of money as an interest-free loan through a lottery system. The principle of an ideal multifunctional farmer/producer cooperative was more present in the study area; the same picture was also visualized in other agroforestry production areas in Bangladesh [6]. Plenty of studies throughout the world had indicated that farmer cooperatives were considered an effective instrument for bringing socioeconomic improvement and rural development [17,23,24,32–35]. Farmer cooperatives can simplify marketing and values by directly bypassing intermediaries and reducing different costs [36,37]. In this regard, the study also explored the small-scale farmer-driven cooperatives in Japan that had already established a detailed and developed model.

3.5. Agriculture Cooperatives in Japan

The Japanese Agricultural Cooperatives (JA) have evolved out of the ashes of World War II, and JAs have demonstrated their social, economic, and organizational potency through hard work. Studies in the literature also revealed that the most typical cooperative example can be found in Japan [18,20,38,39]. Japan has different types of coop organizations, and the study selected the Shimogo agriculture cooperative, which is a local-level, farmer-driven primary cooperative organization.

3.5.1. Institutions and Organization of the Shimogo Cooperative

In Japan, the end of World War II opened a new way to cooperative legislation, and the agricultural cooperative law was enacted in 1947 after the agrarian reform was introduced [38]. Shimogo was established in 1948, and has operated for a long period of time due to its vision, leadership, and commitment by local farmers. Together with its head, the Shimogo coop had very efficient board members (two of whom were women), working groups (formed by the board members), and audit advisors, and they aspired to expand further (Figure 5). General members' voices were always reflected in general meetings, and the board members would select the head of the Shimogo for a tenure of three years.

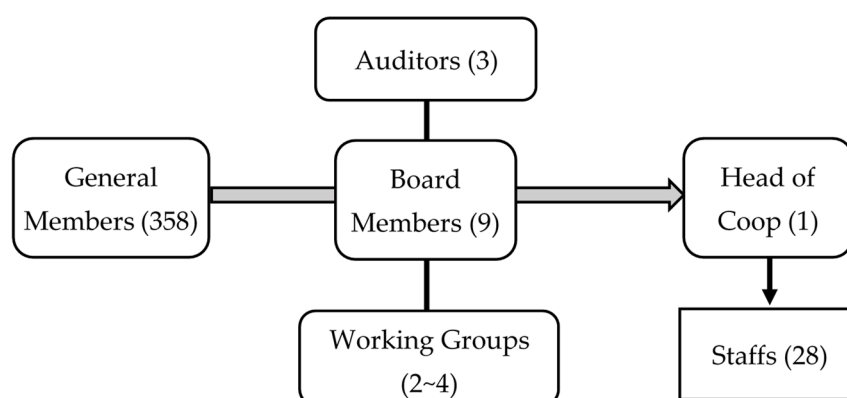


Figure 5. Organizational structure of the Shimogo coop in Japan (parenthesis shows the number of person in each level).

The Shimogo coop had a specific planning commission so as to deal with specific farmer (product-based) groups, and collate all of the technical and advisory decisions in order to send them to the head accordingly. These planning commissions oversaw major decisions regarding fixing product-selling prices, and all of the farmers (100%) mentioned that the planning commission arranged several meetings with farmers/groups where both parties fixed the products' final prices (Table 3). However, the planning commission had explained product features and also negotiated with the leading consumers before fixing the product prices. This clearly indicated that the Shimogo coop was a real democratic organization. Besides the production function, the planning commissions were also engaged in planning the market strategy, welfare of farmers, as well as finances and other important tasks.

Table 3. Different types of meetings occurred in the Shimogo coop in Japan.

Types of Meeting	Time	Actors Involved	Major Issues
Own farmer group meeting	Once a month, as per need	Planning commission, farmer group	Evaluate production, costs, and other problems
All farmers, group meeting	At least once in a three-month period, as per need	All farmers, planning commission	Production costs in particular sessions, problems, planning
Farmer with coop staff meeting	Three times a year, as per need	Farmer and particular staff	Fix product-selling prices, evaluate consumer feedback, farmer problems, etc.
Board meeting	Once a month	Board members	Discuss different strategies related to production, selling, and overall issues
Staff meeting	Once a month, as per need	All staff	Evaluate each group's progress, farmer problems, future planning, and other issues
General meeting	Once a year	All farmers and coop staff	Evaluation, next year budget, future plans, and other broad decisions

The Shimogo coop had also launched different types of meetings with local governments and communities in order to enhance farmer livelihood and service functions. Transparency was another point that was maintained properly throughout Japan, and Shimogo was not an exception. Shimogo cooperative has a powerful auditing system, and board members made all of the financial matters very clear and transparent to all of the members. Farmers also mentioned that Shimogo gave preference to their voice and evaluated consumer feedback on a regular basis. All of those functions made Shimogo a prominent organization on Kyushu Island.

3.5.2. Marketing and Other Services of the Shimogo Coop

Marketing: Agriculture marketing is the performance of all of the activities that direct the flow of goods and services to the consumer from the farmer in order to achieve the farmer's objectives [3,40]. In Japan, the marketing system is very developed and structured. It would not be possible to implement the exact Japanese marketing systems in Bangladesh; rather, the study tried to give insight into the marketing of the Shimogo coop and, in particular, the marketing techniques of farmer products. Most of the coops in Japan had established a very strong and developed marketing system, and the coops' main role was to establish a link between farmer and consumer or farmer and retailer/supermarket (Figure 6). The coops collected farmer products and processed them for marketing channels and, in some cases, coops directly sold farmer products through the consumer cooperative system (shop called 'Seikyou' in Japanese) (Figure 6).

In the Shimogo marketing process, there was no scope for the involvement of intermediaries. The transportation of farmer products to the retailer place was also done by the Shimogo coop. The Shimogo coop charged around 15% of the farmer price as a part of the coop income, which included transportation and service functions. For example, Shimogo fixed a lettuce price at 120 Yen for farmers, and the coop sold it to the shop/retailer or consumer directly at 138 Yen. The retailer or supermarket would sell the same lettuce at 150 Yen to the consumer, as mentioned by the coop staff and farmers (Figure 7). In case of product processing, Shimogo added a service charge of the products after the farmer price. Therefore, each and every farmer knew how much money the coop received as a service charge, and the product-selling price. However, the farmer did not know the retailer or supermarket-selling price, but the average additional value was $\approx 20\%$ of retail price. So, the marketing margin of a lettuce in the Japanese marketing channel was 20%, and in the case of direct selling by the coop, it was only 13%. The respondents also mentioned that the marketing margins varied from product to product, but the variation was very low ($\approx 5\%$).

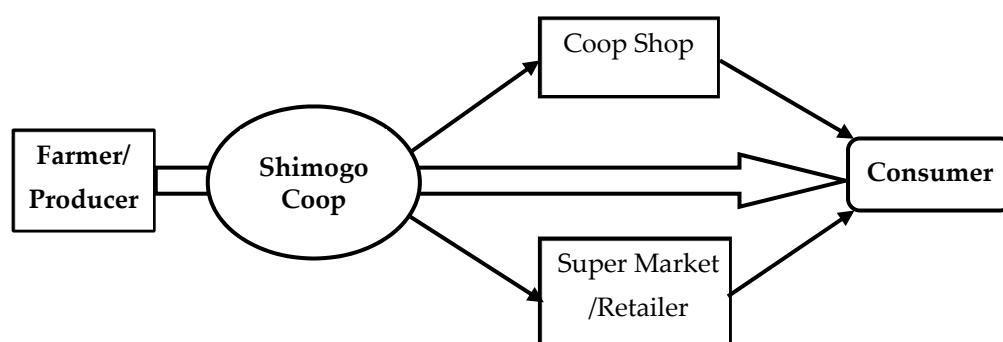


Figure 6. Marketing channel of the Shimogo cooperative in Japan.

Grading is treated as a basic function of product marketing, and is defined as the classification of products according to some standards or measures [17,41]. Grading and storage functions were also done by the coop, and in some cases, primary processing was done by the farmers themselves. The Shimogo coop had already developed meat and milk processing plants so as to process farmers' fresh products. The processing costs were added as extra value to those products, and in most cases, the Shimogo farmers were involved in processing their products, which would add an extra income to the farmer. It also offered alternative job opportunities to the member farmers, and enhanced their household income. In every step of product grading and storage, the Shimogo coop maintained food quality and food safety properly, as reported by the coop staff. The farmers also mentioned that the Shimogo coop consulted with the member farmers in order to fix the farmer product prices. That means that the farmer product prices were determined by a discussion between two parties, and all of the farmers mentioned that the coop staff properly evaluated their production costs.

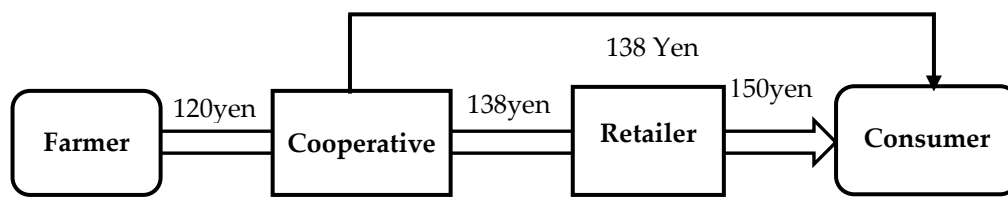


Figure 7. Price of lettuce in the Shimogo cooperative marketing channel in Japan (1 USD \approx 110 JPY).
USD: United States dollar, JPY: Japanese yen.

Production: The Shimogo coop was known for its quality and safe products. Although the production and product quality depended on the individual farmers, the coop staff always supported farmers by supporting quality input materials and providing necessary information. A vegetable farmer mentioned that she cultivated organic vegetables, and emphasized the quality of the vegetables, rather than the quantity and price. Her vegetables were processed by the coop staff and used her name tag, which was very popular with consumers. Our study also found similar information through interviews with rice and chicken farmers.

Credit: Credit has been treated as a valuable service function that is provided by the cooperative organization in Japan; however, the Shimogo coop offered direct credit systems or bought agricultural implements on behalf of farmers. That means the Shimogo coop had bought agricultural materials and machineries on behalf of farmers, and also provided easy or interest-free loan facilities. The majority of the respondents mentioned that the coop tried their best to fulfill farmer demand, especially in buying agricultural machineries. In case of heavy machineries, the Shimogo coop asked central JA or government banks to provide such facilities as easy loan/credit systems. So, Shimogo provided easy credit systems to members, and the members were satisfied with the service provided by the coop.

Extension and Information: Agriculture extension and information is one of the core activities for any cooperative in the world. Agriculture extension of Shimogo had covered technical guidance, the selection of product materials, marketing information, management, and planning. Shimogo had some specific planning commissions that worked out a set of advisory and extension activities for farmers. Agricultural extension services were largely ignored due to their low profits, in spite of their significance as a main activity of the general JA in Japan [23,42]. Shimogo was not an exception; however, Shimogo had still maintained some basic extension services for their farmers that needed to be improved, as mentioned by 10% of farmers.

Collaboration: Shimogo had maintained its own principle not to collaborate with other coops. Although the central government and JAs had exerted pressure to collaborate with other coops and made Shimogo a commercial enterprise, Shimogo strictly denied the unification, but maintained good collaboration with the JAs, the local government, and other coops. Shimogo is an independent cooperative member of the JA, and maintained this decision on the basis of farmer voices. Shimogo often took loans from other organizations, and maintained a good relationship with the local government, as mentioned by the head of the coop. He also mentioned that unification with other coops might create many problems, such as the coop becoming too large to manage, the coop losing deep contact with farmers and members, the coop leaders being involved in politics, bureaucratic problems increasing, the potential failure of a large coop resulting in heavy economic losses, and finally, in farmer livelihood enhancement being ignored.

Risk Management: The main obstacle faced by farmers is selling their products and ensuring a good price for their products. As the study mentioned earlier, the Shimogo coop bought all of the farmers' products, and product prices were fixed by negotiation between both parties. All of the farmers (100%) mentioned that they were happy with the facilities provided by the Shimogo coop, but were not aware of crop insurance systems, unlike the situation in the United States (USA) or western Europe. That means that farmer crops that were lost to bad weather or other anthropogenic reasons were not covered by the coop or government insurance systems.

Financial Management: In every general meeting, coop staff had to present a detailed yearly financial statement in front of all of the members. Before that, the three auditors had evaluated/checked all of the financial transactions of the Shimogo coop, and proceeded to the general meeting for approval. It was mentioned here that the main income of the Shimogo coop came from the processing of products and the financing or crediting of different agricultural inputs, as well as the buying and selling of farmer products. On the contrary, a major portion of the coop income was disbursed as staff salaries and basic maintenance costs. So, the net profit of the Shimogo coop in “2016–2017” was 18107 (‘000 JPY), and it was 15641 (‘000 JPY) and 13016 (‘000 JPY) in the years “2015–2016” and “2014–2015”, respectively. However, the coop had some previous deficits, which they adjusted from the annual profit of the coop.

3.5.3. Welfare of Shimogo Coop

As per the needs of the members and the local communities, Shimogo had provided a number of welfare facilities to the adjacent communities. Shimogo had already established an elderly house, automated teller machine (ATM) booths for cash withdrawals and bank services, a gasoline station, a medical clinic, and a departmental shop in order to help the local communities. The study asked every farmer whether the welfare facilities were enough or not; in reply to this question, all of the farmers expressed their satisfaction with the Shimogo coop for providing such welfare facilities. However, about 20% of farmers demanded establishing another elderly house, in order to take care of the community’s old people by the coop.

3.5.4. Challenges of the Shimogo Coop

Shimogo stands for a viable organization example in the Kyushu Island of Japan, despite facing some challenges. The Japanese agriculture and forestry sectors shrunk between 1960–2005, as their contribution to the GDP declined from 9% to 1% [20]. The number of people working in this sector had also severely declined [23]. Shimogo had faced aging problems of their agriculture farmers, which was also considered a common problem all over Japan. The head of the coop also mentioned that about 20–30% of the existing farming establishments will not continue after the death of the owner, as they do not have offspring to continue farming activities. He also mentioned that the number of milk farmers had declined, and milk production was just at the threshold level of processing-plant capacity of five ton/day. Shimogo had also suffered financial problems, and depended on the JA to purchase farmers’ heavy agricultural machineries.

3.6. Lessons to Be Learned

The study already discussed earlier that the agroforestry farmers of Bangladesh would need to establish cooperatives in order to handle middlemen and other social problems. Since the farmer-driven cooperative approach was able to alter the Japanese agriculture sector [19,38,43], the Bangladeshi agroforestry farmers may consider the system for their development, and subsequently make the country’s economy healthier. Based on Japan’s coop experience, the study pointed out many positive factors that would be essential for the success of agroforestry cooperatives in the developing world. Some of the important lessons were: to have coops as member-driven, non-political, and self-reliant organizations that have the complete trust of their members; cooperatives would get preferences and support by the local government with minimal intervention; coop leaders would be role models elected by the general members; coops would be managed by efficient, experienced, and qualified staff; coops would maintain equity and good vision; coops would provide marketing facilities and establish a link between farmers and consumers, or at least farmers and retailers for product buying and selling; coops would provide possible technical and logistic help to farmers; coops would cover members’ possible welfare and risk management facilities; and finally, cooperatives would be open and socially aware institutions that displayed social concern and maintained good relations with the community at large.

The core issue of the cooperative lesson was that farmers would rely on the coop for the provision of facilities and services, rather than relying on other organizations. Coops would promptly provide

a number of facilities and services to the farmers as needed. In other words, a member would not feel that he was dependent on the coop; rather, the coop would be dependent on the member [18]. However, the present stage of development of the Shimogo cooperative was the result of 48 years of investigation, innovation, and work. The members were the main radiant factor from which the strength of the Shimogo cooperative emanated. However, these successful and positive sides were not devoid of weaknesses. The major challenge faced by the Shimogo coop was the rapidly aging agricultural producers/farmers. The issue of the declining numbers of member farmers should be an important concern for the Shimogo coop. On the contrary, the declining of member numbers would not be a serious problem in the case of agroforestry farmers in Bangladesh. To combat future problems [44], the coop would need to establish strategies and policies at the beginning. In spite of the aging problem, the agriculture cooperative of Shimogo would have certain aspects that can be adopted in developing countries such as Bangladesh.

The Japanese cooperative, and in particular the farmer group concept, has been significant in improving and sustaining high levels of agricultural and forestry productivity, and every farmer group can speculate and create long-term strategies and vision. Shimogo also showed an ability to adapt to their farmers' needs, as well as the expectations of the local community, within their sociocultural context. Member farmers of the cooperative shared their knowledge and skill, and frequently had discussions on common production problems and collaborated on potential solutions. Accordingly, the farmers have learnt enormous lessons regarding increasing the efficiency of various agricultural inputs and overall crop productivity, and finally making higher profits through the service and functions of the cooperative. This sort of knowledge sharing, networking, participation, and restoration of interpersonal relationships and peace among the coop members would be the main basis for sustainable development in the agriculture and forestry sector [22,45], which we learned from the Shimogo case. Therefore, we could say that farmer-driven cooperatives are modalities of modern small-scale agriculture and forestry farming systems. The study also understood the reality and situation differences between Japan and Bangladesh; so, the lessons and the dynamism of the Shimogo cooperative would be the key to developing and sustaining farmer-based agroforestry cooperative systems in Bangladesh.

4. Conclusions

Agroforestry practices provide substantial opportunities to the local farmers of Bangladesh and other developing countries for increasing their farm production and income. However, the involvement of many intermediaries and complex bureaucratic systems has made the agroforestry production and marketing systems critical for local farmers. Intermediaries have created high marketing margins on the low-cost farmer products in the local markets. The results of the study clearly visualized how the low-cost farmer products accrue higher prices in a step-by-step process through the intervention of multiple intermediaries in the Bangladeshi marketing system. Although agroforestry marketing systems in Bangladesh have faced a number of problems, there have been plenty of policy options that are expected to improve the systems. One of the tried and tested ways is to establish farmer cooperative organizations at the local level. Japanese multipurpose agricultural cooperative organizations would be a typical example that could help strengthen and establish a farmer-based cooperative model in Bangladesh and other developing countries. Keeping Bangladeshi conditions in mind, the study selected the Shimogo cooperative as a typical smallholders' farmer organization, and considered its different aspects for policy recommendation. The findings of the study noticeably showed that the efforts of the appropriate marketing techniques and vigorous service functions of the Japanese cooperative would easily eradicate the intermediaries' involvements, and smooth the marketing channel for local farmers. In addition, the welfare facilities of the Shimogo cooperative have made the cooperative a trusted and reliable organization within the local farmer communities. It was clear enough that the agroforestry farmers of Bangladesh would need a farmer-driven, farmer-controlled, and farmer ownership responsive cooperative in order to overcome the middlemen and marketing

issues of agroforestry products, and the Shimogo cooperative of Japan would be a typical example in this regard.

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