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Growing Arabica Coffee in the Mountain: Evolving Production and Marketing Practices in Benguet and Mountain Province

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Abstract

Using focus group discussions and key informant interviews, this paper presents the production and marketing dynamics vis-à-vis local capacity to meet local demands in selected Arabica growing communities in Benguet and Mountain Province. Findings show that there are various efforts done locally to keep the industry thriving amidst challenges such as climate hazards and the attractiveness of converting to vegetable cash crop production. Two distinct potential good practice models figure when looking at the coffee industry's major local players: the individual entrepreneur and the organized cooperatives. These models are not new, but findings show that each model has elements to share and areas where each model can work at its best. These models have upscaling potentials.

KEYWORDS

arabica cultivar
individual entrepreneur
organized marketing
specialty coffee
institution building

Introduction

Coffee production is not new in the Cordilleras. Written accounts show that Arabica coffee was introduced to the Cordillera region in 1875 by a Spanish military governor of Benguet, Manuel Scheidnegal y Sera (Census of the Philippine Islands, 1905, as cited in Dado, 2019). Arabica coffee production has occasionally served as a source of cash for a household. It has remained a swidden crop or backyard crop left on its own to grow (Allad-iw, 2007; Olofson, 1981) and as an intercrop with other vegetables and fruit trees. The region produces different varieties of coffee. The largest share of production is coffee robusta, a variety commonly used in soluble coffee. On the other hand, coffee Arabica, which is considered specialty coffee, only accounts for 10% of the region's total coffee production (Department of Trade and Industry [DTI], 2016).

In the Philippines, Arabica coffee is found to grow favorably in the cool areas of the Cordillera Administrative Region (CAR), particularly in Benguet and Mountain Province. The Coffee Foundation Institute of the Philippines recognized that green beans of Arabica coffee from these areas have excellent crop quality and comparable to the world-class coffee of South America (Bagao, 2000

as cited in Luis & Macanes, 2006). Presently, Arabica coffee is one of the top five value crops in the region, with Benguet Province at the forefront for producing this valuable crop (Luis & Macanes, 2006).

The green bean yield of Arabica coffee in Benguet is very low. The Department of Agriculture-CAR survey report in 2002 found that an average of only 300 kilograms of green beans are produced per hectare per year. This yield is far below the 2 to 3 tons of green beans per hectare by the Arabica coffee-exporting countries of South America, continuously increasing at 2.25% or 1.65 metric tons green beans per year (Mojica, 2000 as cited in Macanes & Luis, 2006; Pablo, 2012). The DA-CAR report further stated that one foremost cause for low production is plant diseases that infect the crop. Low yields can also be due to insufficient use of modern farming technology and scant attention to maintaining coffee trees (Chaves, 2011) and the lack of good agricultural practices.

Considering the very low growth in the production of coffee Arabica vis-à-vis the increasing demand in the global market, the paper aims to present the production dynamics, marketing strategies, and other social conditions that affect the Arabica industry's performance in Benguet and Mountain Province. Against this backdrop, two types of industry players become emerging models: individual entrepreneurs and organized cooperatives of coffee producers. These players become important in a relatively young industry in a commercial scale context.

Methodology

The research was conducted in Benguet and Mountain Province, particularly in areas or municipalities where coffee Arabica is significantly grown. In Benguet, the study areas are Atok, Buguias, Bokod, Kibungan, La Trinidad, Tublay, and Itogon, while the municipalities in Mountain Province are Sagada, Besao, Sabangan, Bauko, Tadian, and Barlig. Face-to-face interviews, focus group discussions (FGD), and key informant interviews (KII) were conducted with coffee farmers and processors, coffee shop owners, coffee farmer associations/cooperatives, local government units, and other government line agencies. Secondary data from line agencies and coffee industry organizations were also used.

Results and Discussion

Production Dynamics

Based on the Philippine Statistics Authority (PSA) data in 2020, 17,914.98ha is used for Arabica coffee plantations with 12,358,406 bearing trees. Most coffee farmers operate and own an average farm size of one to two hectares. Most farms are intercropped with vegetables, coconut, fruit trees, and forest trees (especially in the case of Arabica coffee). There are very few commercial-scale plantations in the country. In interviews of coffee growers in Benguet and Mountain Province, they only have an average area of 500m² planted with Arabica since most of them are backyard farms, except for several growers who maintain plantation farms.

In 2015, CAR ranked seventh as a region producing coffee in the Philippines in terms of the number of coffee-bearing trees with 4,455,089 trees (DTI & DA, 2016). And in 2016 and 2017, CAR went up to the 5th rank. As far as Arabica is concerned, in 2016, the Cordillera Administrative Region (CAR) was in the top five Arabica producing regions, which produced 531.29 MT of Arabica coffee (DTI, 2016).

Based on some studies (Ferstl, 2009; DA, 2013; Tad-awan, 2013), coffee Arabica trees are more productive when planted in areas having an elevation of 1000m above sea level. Tad-awan (2013) called areas with 1000m to 1500m above sea level elevations as low mountain zones and had identified the following municipalities in Benguet under low mountain zones: Bokod, Itogon, Kabayan, Kapangan, Kibungan, La Trinidad, and Tublay. PSA data shows an increase in the area planted with coffee Arabica trees in Benguet from 236ha in 2013 to 256ha in 2014 (Table 1). The production volume shows a fluctuating trend in the past five years (Figure 1) despite the comparative number of bearing coffee trees from 2014-2017. This trend can indicate the promotion activities, through projects and assistance, implemented by the various stakeholders in the coffee industry.

Table 1

Number of Bearing Trees and the Area Planted with Arabica Coffee in Benguet from 2013 to 2018

Year	Number of Bearing Trees	Area Planted (has.)
2013	226,951	236.00
2014	246,173	256.00
2015	246,173	256.00
2016	246,272	256.00
2017	246,272	256.00
2018	200,459	480.94*

Source: Philippine Statistic Authority (PSA,2018) and DA-CHARM data, 2019

**figures may include varieties other than Arabica, CHARM Provincial data*

In 2016, the production of dried coffee berries decreased, but the number of bearing trees increased by 99 trees, which implies a decrease in the yield of coffee cherries per tree. One factor is the damage caused by the super typhoon Lawin that traversed Northern Luzon in October, which is the onset of harvesting of Arabica coffee in the province (DTI, 2016). Figures from DA-CHARM registered a reduction in the number of coffee-bearing trees and again, what could account for this was the typhoon Ompong in 2018 that caused landslides. In Tublay alone, one informant claimed that Typhoon Ompong wiped out about 60% of her coffee plants.

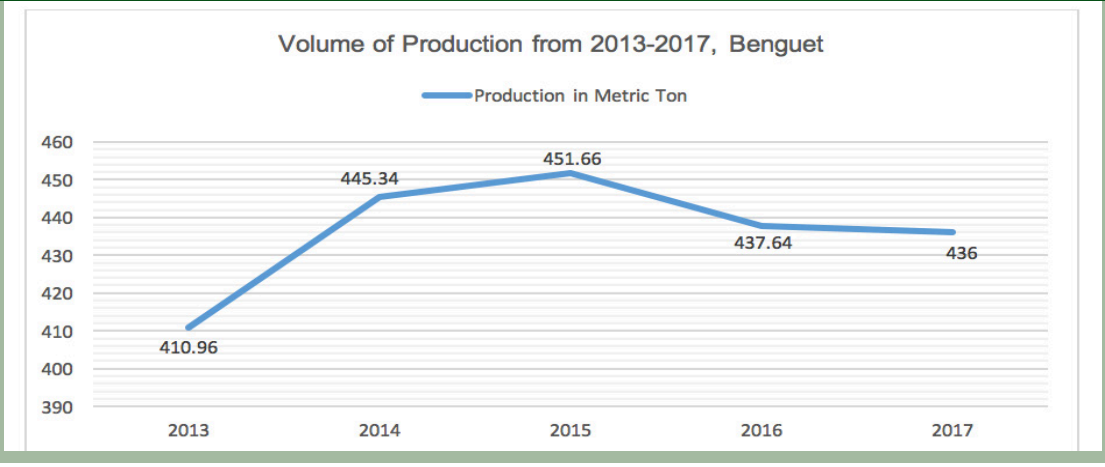
Mountain Province is another province in the region where coffee Arabica grows best. According to the Mountain Province Office of the Provincial Agriculture (OPAG), Arabica coffee was introduced in early 1900 in Sagada's hinterlands in the barangays of Fedelisan, Pide, and Aguid. Arabica coffee was known as Fedelisan Coffee, commonly known now as the 'native coffee'. Its production also spread to the province's western municipalities, with elevation ranging from 800 to 1,800 masl. Table 2 shows the coffee production in Mountain Province, by municipality.

A total number of 727,086 coffee trees were planted in 2017, which were expected to bear fruits in the following years, while 204,996 are already bearing fruits with a total of 216,867 kilograms as recorded in year 2017. From the records of OPAG Mountain Province, the average productivity is 0.94 kilograms of green beans per coffee-bearing tree.

The arabica coffee production in Mountain Province was increasing, until 2014 when it started to decrease (Figure 2). During the first regional forum on Technology, Innovation, and Market Opportunities for Coffee conducted in Batangas in September 2016, the DTI-Mountain Province Director identified some observable trends that could account for the decline in coffee production, including the shift of farmers to other more profitable crops, old age of coffee trees, limited rejuvenation of standing coffee trees, and poor clones and farming practices. Starting in 2000, Paracelis coffee farmers shifted from coffee

Figure 1

Volume of Arabica Coffee Production from 2013 to 2017 in Metric Ton (mt), Benguet



Source: Philippine Statistics Authority, 2017

Table 2

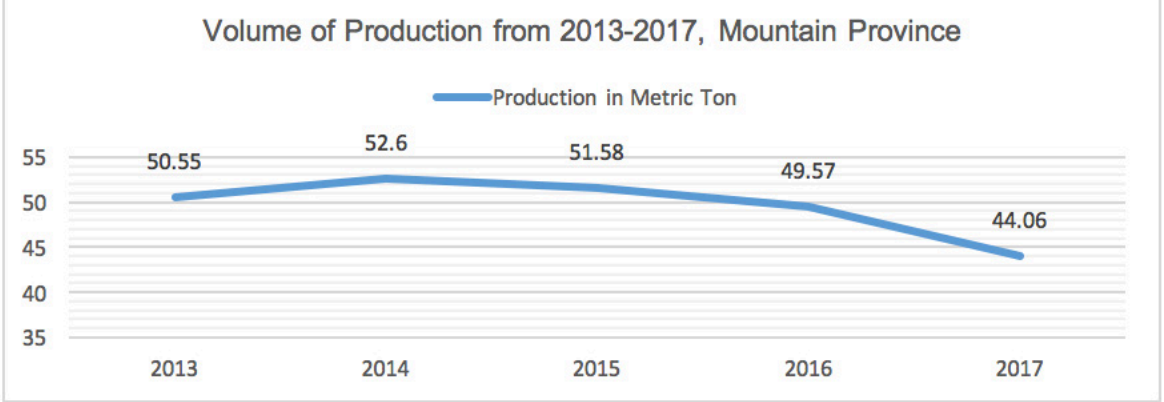
Coffee Profile of Arabica in Mountain Province (2017)

Municipality	Number of Newly Planted	Tree Bearing	Production (kg)	Productivity (kg)	Number of Farmers
Barlig	17,472	9,337	7,469	0.80	100
Bauko	28,625	5,225	5,225	1.00	500
Besao	57,727	20,000	20,000	1.00	900
Bontoc	3,804	3,450	2,760	0.80	110
Paracelis	5	80	64	0.80	5
Sabangan	15,064	20,325	20,325	1.00	320
Sadanga	2,155	2,768	2,206	0.80	198
Sagada	482,234	111,811	122,992	1.10	11,250
Tadian	120,000	32,000	35,826	1.12	1,095
Total	727,086	204,996	216,867		14,478

Source: Office of the Provincial Agriculturists, Mountain Province 2017

Figure 2

Volume of Production from 2013 to 2017 in Metric Ton (mt), Mountain Province



Source: *Philippine Statistic Authority (PSA)*, 2017

to corn production, the same as the case of Barlig, where coffee growers turned to citrus farming. Again, the need to improve coffee growers' productivity, profitability, and product quality, increase in the production area, and provide market access and value-addition in coffee products have been the resounding call from farmers (DTI, 2016).

The number of bearing trees in Mountain Province (Table 3) increased by an average of 0.14% from 2013 to 2015 and decreased by 3.79% from 2016 to 2017. The area planted also increased in 2015 but decreased in 2016 to 2017 by an average of 9%.

Table 3

Number of Bearing Trees and Area Planted for 2013-2017, Mountain Province

Year	Number of Bearing Trees	Area Planted (has.)
2013	53,851	77.00
2014	53,889	77.00
2015	54,001	79.00
2016	53,040	69.00
2017	49,964	65.00

Source: Philippine Statistic Authority (PSA), 2017

Philippine Statistics Authority data in 2020 show that the percentage change in Arabica coffee production from January to June 2019 with the first half of 2020 registered only an increase of 0.1%.

Cropping System

There are two common production systems in Arabica production based on this study's documentation: the "backyard" production and the "agroforestry" or intercropping/multi-cropping type in plantation and small-scale production.

For the "backyard" production system, this loosely refers to coffee trees maintained for non-commercial purposes. Backyard coffee trees also refer to century-old coffee trees left on their own to grow around household backyards and pathways, where leaf litter and foliage are thrown. Coffee berries from backyard production were mainly for household consumption, processing of which were done manually by the household members themselves. However, there were instances when their produce was more than what they needed, enabling them to share with relatives and friends or even sell to other community members.

Selling surplus coffee becomes an additional source of income for some farmers. As pointed out around the 1980s or even earlier, the cash value of coffee has been recognized, and stories have it that coffee beans were being gathered, dried, and sold to "Umali'" or "Garcia" market outlets in Baguio City. Informants of Benguet also recall that the cash from coffee beans could "send children to school". Coffee being a cash crop might have brought about the planting of coffee along the margins of the swidden or as hedgerows – which is a variation of backyard planting.

Aside from the "backyard" production system, coffee trees were also grown in agroforests. With the recent spike of interest in coffee, other production systems are becoming more pronounced. Recognizing that coffee is a perennial crop and farmers need food for the family, growers intercropped cash crops and other high-value crops between coffee trees like the agroforestry land use management system.

From the interview data, one can see various production strategies – coffee with Alnus or coffee under-pine and coffee with chayote or citrus. Coffee with chayote has the aim of providing partial shading to coffee trees. On the other hand, Alnus or pine trees serve as the above story for coffee plants as these are intercropped with coffee trees. Some respondents intercropped cash crops as an alternative source of income while waiting for the coffee to bear.

The chairman of the Atok Arabica Growers Marketing Cooperative (ACOGMAC) stated that he planted Alnus, chayote, passion fruit intercropped with coffee trees, and does backyard hog raising. He found these crops compatible and followed the agroforestry design, where chayote serves as the above story of the coffee trees. He said he planted the Alnus trees around the coffee plantation and practiced pruning to ensure that trees do not go beyond 20 feet. Alnus trees also serve as vine rows for passion fruit. Other fruit trees intercropped with coffee include jackfruit, mango, and banana. Fruits from the vine-plants were sold in the market, if not fed to the pigs when market prices are low. Hog raising is one of the well-matched businesses with coffee. The manure would serve as fertilizer, and the coffee pulp can be fed to the pigs.

Coffee growers do not necessarily observe planting distance. They practice random planting of coffee trees in sloping areas. Some informants claim to be aware of the ideal planting distance but think planting distance depends on the planting site slope.

Seedling Source and Nursery Accreditation

Increasing the production of coffee Arabica imposes an increase in much-needed inputs such as seedlings. Most coffee growers in Benguet and Mountain Province depend on wildlings, especially those who maintain coffee trees in their backyard. Some informants also say that even the DENR in their regreening program was not likewise conscious about the source of the seedlings they use. This finding implies a limitation on the source and the quality of seedlings to farmers who are willing to start a coffee farm or increase their area planted with coffee trees.

In response to the above limitation, farmers who wanted to engage in coffee production accessed certified seedlings from accredited nurseries such as the Bureau of Plant Industry

(BPI). NGOs such as Jaime V. Ongpin Foundation, Inc. (JVOFI) and Cordillera Green Network (CGN) were also mentioned in relation to the supply of planting materials or the setting up of nurseries. Data also show many have been accessing their seedlings through the Institute of Highland Farming Systems and Agroforestry at Benguet State University (IHFSA-BSU). IHFSA-BSU is in the process of registering BSU Arabica varieties with the Bureau of Plant Industry (BPI) and National Seed Industry Council (NSIC). Interviewed coffee growers recognized BSU cultivars as high-yielding and pest resistant, and hence, even without its certification, it has been distributing seedlings to farmers. The voluminous requirements for registering and accrediting nurseries have been consistently cited as a reason for the certification delay. Some grower informants also claim to have tried to apply for nursery accreditation but failed because of the voluminous requirements.

Another informant said that he accessed his initial coffee trees from the Mountain Province Arabica Coffee Growers (MPACG), the LGU initiated organization, aside from accessing from BPI-DA. Another accessed his seedlings from Ay-ayak, a locally initiated private nursery establishment. Apparently, several individual entrepreneurs were able to pick up the need to establish nurseries for the industry and were also correctly identified by Cordillera Green Network, an NGO interested in advocating coffee trees; hence support was poured into nursery establishment. One informant claimed to have invested an amount of Php20,000.00 and part of this amount went to the nursery establishment. Hence, the roadmap identified seed investment as a critical factor in the productivity concern of limited source of quality seedlings. About three informants who accessed their seedlings from BPI are now selling seedlings to coffee growers. From the Regional Development Council (2016) report for 2018, it is targeted to establish a community-based nursery, but as of October 2018, no new nursery was set-up. Field data reveal that farmers cannot comply with the requirements of BPI on the accreditation of nurseries. For example, one condition is to identify a mother plant, but the farmers cannot identify one because they do not even know their plants' variety. Certainly, this needs technical assistance.

In Mountain Province, an accredited nursery is being maintained by a coffee grower. He claimed he accessed his initial seedlings from BPI-DA, and later on set up his nursery. Accordingly, it took time and money for him to get the accreditation for his nursery. But now, the accredited nursery is supplying seedlings to LGUs and other entrepreneurs from other municipalities. The other accredited nursery is with the Mountain Province State Polytechnic College (MPSPC).

Processing

After harvesting the coffee berries, processing includes drying the beans, milling the green coffee beans, roasting, and grinding the coffee beans. Coffee growers can sell their coffee in different forms. Some sell the produce as fresh berries, while some sell semi-processed products. Postharvest processing is very important since it can determine the price of the finished product.

The dry method in processing coffee berries is most widely used, but several coffee growers practice the wet method. The dry method is when harvested coffee cherries are dried in the sun or other mechanical driers, and the dried outer parts are separated from the bean. On the other hand, the wet method is done by washing and depupling harvested coffee cherries using a depulper. Natural fermentation then takes place in which natural enzymes present in the coffee cherry facilitate mucilage degradation. The end product is called “parchment” or “washed” coffee (Smith, 1985, as cited by Haile & Kang, 2020). Drying the beans allows some growers to sell their coffee as parchment to cooperatives or other coffee processors.

Milling the beans, including hulling, polishing, grading, and sorting the coffee beans, is very difficult, particularly if the coffee growers are not well informed and have no available equipment. For the coffee growers in Benguet and Mountain Province, hulling is made easy using de-hulling machines. In grading and sorting according to the size and color of coffee beans, not all coffee growers are skilled and knowledgeable. Only those who were able to attend trainings on grading and sorting can do so. The lack of grading and sorting becomes a hindrance to the coffee growers, particularly in product pricing. Buyers pay less since the coffee beans are not sorted or are not graded and sorted correctly.

In Mountain Province, a respondent said that

it is only now that green coffee beans (GCB) are sought after and are even more expensive as compared to roasted coffee beans because of the supposed therapeutic qualities, like in weight loss.

The most common form of coffee sold to end-users is either roasted or ground coffee. Small-scale coffee growers roast coffee manually using the traditional pan over burning wood or a stove. But for medium to large-scale coffee farmers, the use of roasting machines becomes more efficient. High-end roasting machines are available in the market but are very expensive. Hence, coffee growers in Benguet and Mountain Province use modified or adapted equipment made in the Philippines. Almost all the coffee growers' equipment were endowments coming from various government line agencies, LGUs, and NGOs. Some equipment are used personally by individual growers, while some are assigned to cooperatives or associations that their members can use depending on their agreed policies. The advantage of using cooperative-based roasting machines is the roasting meets the quality standards. Another advantage is that cooperatives have personnel with appropriate trainings on the use of the equipment, thus ensuring uniformity of roasted beans. The cooperative also takes care of the other post-harvest activities such as packaging and marketing. The only disadvantage cited is when machines that were given are either too big, like the 35-kilogram capacity given to one cooperative with a low harvest, or too small like the 1-kilogram roaster for big coffee producers, rendering the use of these machines not maximized. Due to these experiences of receiving inappropriate machines, coffee processors expressed their preference for locally fabricated equipment.

In terms of productivity, the Tublay Organic Farmers and Producers Association (TOFPA) boasts of more productive coffee trees. Five informants claim that their coffee trees aging from 8 to 12 years can still bear 2 to 3kg per tree. From the Tublay coffee growers, arabica yield is best realized at this age of the coffee trees.

Marketing

Around 35% of the respondents claim the coffee they produce is just enough for household consumption, while the rest have a surplus they sell to the local market. Those who market their coffee produce sell it either as GCBs or ground roasted coffee. Selling coffee at present is quite difficult since the market is saturated with different coffee brands, and consumers are aware and selective of what they want. Marketing coffee requires the use of a marketing strategy to ensure profit. Whether farmers consider selling coffee as their primary source of income or as an alternative source, marketing strategies are crucial. The coffee farmers' strategies and practices analyzed considered the following marketing mix: place, product, price, and partners.

Market Outlets. Before, market outlets for coffee from Benguet and Mountain Province were limited to the community market and the two outlets in Baguio City. At present, one can see expanding market outlets for coffee with the recent boost of the coffee industry as a regional One Town One Product (OTOP). Coffee sold by growers can be in different forms such as coffee cherries, parchment coffee, GCB, roasted coffee beans, or ground coffee. The particular product form determines which market the coffee is sold to.

Market outlets of Benguet and Mountain Province farmers and organizations include the following: (1) Garcia and Umali (Baguio Public Market); (2) Cooperatives/Organizations; (3) Coffee shops; (4) Specialty coffee markets; (5) Personal connections; (6) Manila-based corporations; (7) Consolidators; and (8) LGU-established markets; and trade fairs.

Local markets still dominate. Garcia and Umali coffee booths located in the Baguio City Public Market are where individual coffee growers bring their coffee beans in semi-processed form, either as parchment coffee or GCB. Coffee growers prefer to sell their products to those who pay in cash. Perhaps this why coffee growers, who articulated that they see some non-standard trading practices such as price is based on the "feel and see" method, still sell some of the beans to these market outlets. With information dissemination on grading quality, most informants are now tapping other market outlets as they claim that their prices are better and are bent on following fair marketing standards.

From the interviews, Garcia and Umali market outlets have dominated the scene for the longest

time – from local respondents starting in the 1950s. In 1948, Arsenia Umali started selling coffee in Batangas, and in the early 1950s, the family moved up to Baguio City. Umali coffee booth, located in the Baguio City Public Market, was established in 1953. Garcia, on the other hand, started buying and selling coffee in Baguio City in 1961.

Coffee growers who can produce larger amounts of coffee and have some means of processing may sell directly to coffee shops, specialty coffee markets, Manila-based corporations, and some even sell to personal contacts. Individual coffee growers who produce minimal output amounts may also sell to local coffee shops or cooperatives, or associations. Besides having lesser coffee produce, small-scale coffee growers do not have the equipment or resources to process the coffee cherries further; therefore, they are forced to sell the cherries, which command a lower price than when processed. In such a case, the organizations/ associations are very helpful to the individual coffee growers since they assist in processing the coffee cherries and then selling the finished product to specialty coffee markets, Manila-based corporations, or consolidators at higher prices. LGUs and other line agencies have also done their part in promoting coffee Arabica by implementing various programs and activities such as coordinating trade fairs where coffee growers can advertise their products. Recently, with institutional support to the industry, the network of marketing outlets has also expanded.

Coffee shops are becoming trendy in the Benguet-Bontoc areas, with cafes lined up along the La Trinidad-Bontoc main road artery. Arabica coffee is listed as part of their menu. Almost half of the interviewed coffee shop managers claim they buy Arabica beans from marketing associations that buy from small-scale coffee growers. "Buying their (small-scale growers) products is our way of helping their livelihood and their families," said one of the café owners. Of the 12 coffee shops interviewed, 11 are serving coffee Arabica (Table 4).

Table 4

Profile of Coffee Shops which Markets Locally Grown Arabica Coffee

Cafe	Address	Source of Coffee	Form of Coffee
1	Km. 5, La Trinidad, Benguet	Baguio & La Trinidad Public Market	Dried beans
2	Km. 5, La Trinidad, Benguet	Coffee-related organization who will bring the product in the shop	Ground coffee
3	Balili, La Trinidad, Benguet	La Trinidad Arabica Coffee Producers Association (LATACPA) Baguio Public Market	Roasted coffee
4	Baguio City	Benguet farmers Baguio public market	Roasted coffee
5	Bontoc, Mountain Province	Sagada Gold	Dried beans
6	Atok, Benguet	Own farm AtoKape	GCB
7	Baguio City	Personal connections Ethiopian coffee (international supplier for blending)	Roasted
8	Km. 5, La Trinidad, Benguet	Consolidating the coffee products of the members of the organization	GCB, Parchment Dried beans
9	Km. 5, La Trinidad, Benguet	La Trinidad Public Market	Ground coffee
10	Atok, Benguet	AtoKape	Dried beans
11	Baguio City	Atok, Itogon and Tuba, Benguet (Partner organizations)	GCB
12	Bontoc	Personal connections	Ground roasted beans

The surveyed coffee shops in the Baguio-La Trinidad stretch and Bontoc Poblacion say they buy dried coffee or ground coffee beans from either Umali's or Garcia's, Km. 5 public market outlet, AtoKape outlet, or through other marketing associations. Other café owners build partnerships with local farmers and organizations to supply the quality beans and the quantity they need. Still, some are looking for a steady supply of quality Arabica coffee beans that are locally grown. *"Agbirbiruk kami ti daduma nga supplier with good quality of coffee kasi mejo sabasabli gamin ti raman ti Arabica nu naduma duma pagapuan na,"* ("We are still looking for other suppliers with good quality of coffee beans for consistent taste") said a café owner in Bontoc, Mountain Province assuring to buy locally-grown coffee in the nearby municipalities in the province.

On the other hand, coffee shops preferred to serve 'Barako', a generic term for brewed coffee, which is technically a Liberica specie. One staff from a Café in Bontoc, Mountain Province said, *"Naimas ti Arabica ngem nangina, Barako ti naisanayan ti costumer ken isu biruken da"*. (Arabica coffee is delicious but expensive. The costumers preferred the 'Barako'). 'Barako', in this context refers to the Liberica specie grown in the lowlands.

Because of consumers' changing tastes and emerging lifestyles, some coffee shops are inventing or remaking their trademark in marketing that sometimes Arabica is displaced. For instance, the owner of a Café in Baguio invested in Ethiopian coffee. *"Kailangan kasing sumabay sa trend and of course there is always competition kaya gumawa ka ng paraan para balikan ka ng costumer,"* said one informant. (One needs to go with the trend as there is always competition, and one way to do it is to have a distinct mark so that customers will come back). He also added, *"for today's generation, secondary na lang ang quality coffee like Arabica, nauuna na ngayon yung product presentation, yung tipong pang social media ang dating."* (Today's generation do not mind the quality like whether it is Arabica or not, they are more of product presentation, the likes you can post on social media).

Despite the circumstances mentioned above, Arabica coffee persists. Government agencies facilitate the marketing of coffee Arabica, for example, the Kapetirya. Kapetirya is a coffee shop initiated by the government led by the Department of Industry (DTI), which was recently launched during a trade fair to introduce and promote Cordillera-grown coffee. The Kapetirya is under the OTOP Hub of DTI that also offers locally grown products other than coffee. The café also facilitates regular learning sessions on grading, cupping, and roasting coffee.

Furthermore, LGUs like Tublay in Benguet province and the OPAG of Mountain Province consistently ensure that established local markets for organic crops within the municipal compounds sell Arabica coffee, dubbed as "aromatic coffee with lesser caffeine". With its unique taste and aroma, Arabica can continuously become one of the top finds of consumers. Arabica is also being promoted as a variety best for blending. According to DTI-CAR Regional Director, 20% Robusta and 80% Arabica is one of the best blends of coffee since its aroma and taste are well maintained.

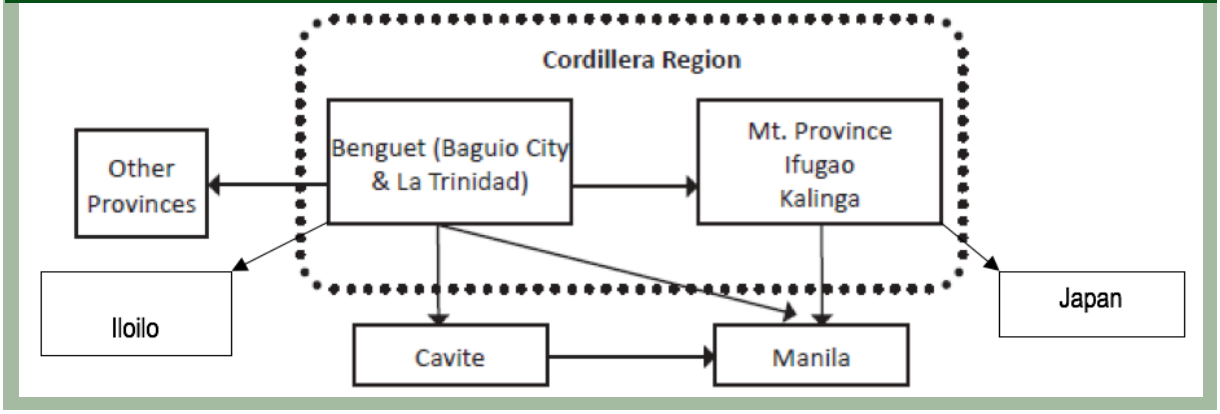
Arabica coffee, considering its taste and aroma, is presently gaining recognition in a lot of markets. Aside from the market outlets mentioned above, a study conducted by Idaho and dela Cruz (2011) also shows that Benguet province is the major source of Arabica coffee in the region. Mountain Province and parts of Kalinga and Ifugao likewise have to source coffee from Benguet because they have limited production. Coffee from the Cordilleras is also being sent to other major processors in Cavite and Manila. Figure 3 illustrates the Supply Chain of Arabica Coffee in the Cordillera Region.

Specialty Coffee. With Arabica being promoted as "the best coffee," NGOs and other private individuals are investing in this field of making it a "specialty coffee". For the case of Barlig, Mountain Province, an informant says he sells some of the coffee Arabica in the community and exports most of his products to Japan. He also mentioned that he buys coffee beans from other local farmers in Kadaclan and processes them before selling them to his established linkage in Japan. CGN, an NGO that has consistently conducted research and development activities on coffee in the region, assists this said coffee grower.

Individual consolidators interviewed in La Trinidad also qualified themselves as "Q-graders". Two respondents who act as 'Arabica consolidators'

Figure 3

Major Routes of Green Coffee Bean and Roasted Coffee (Modified from Idago and Dela Cruz, 2011)



said they have attended coffee grading and cupping trainings, making them qualified to identify beans under specialty or premium coffee. With their skills, they can now classify coffee beans and sell their products at a higher price.

Market price. The price of the coffee product being sold is dependent on the form, quantity, and quality of the product. Coffee can be sold in various forms, like berries, parchment, roasted or ground. Other than the form, coffee products can further be classified depending on their quality or grade. Such classifications render the pricing of coffee complex and varied. However, this should not be a reason for coffee prices to dwindle; instead, it should be a springboard for the quality products to be bought at higher prices.

Currently, coffee berries are usually sold at the prevailing market price and are on a cash-on-delivery basis. Perhaps this is the reason why Garcia and Umali have become a household name for growers because they pay in cash, despite non-transparency in the marketing price, or as some respondents would say, "they (buyers) determine the price."

Realizing that coffee beans can command a better price, many respondents now say that *"haan lang met gayam nga ida ti mabalin nga gumatang, adu pay maymayat presyo na"* (there are other market outlets with better price and that with proper postharvest handling, they can command a better price). It can be recalled that there is really no standard buying price for coffee beans. In a supply chain study of Velasco et al. (2016) in terms of the establishment of the buying standards of GCB, since the farmer cannot tell the quality of its coffee, the trader just relies on the "feel" (whether the coffee beans are wet or dry to touch or when bitten) and "look" of the coffee beans as the basis of pricing. This study corroborated Velasco et al. (2016) in that price was found to be what is agreed between the farmer and the buyer depending on the "feel". Some established coffee buyers and consolidators base their pricing on the "quality of coffee beans". Some coffee growers do not only complain of the low price but also of coffee buyers who use unreliable weighing scales that further reduce the coffee grower's profit.

Organized Marketing. Since there are many small-scale coffee growers, they cannot demand higher prices for their minimal output. Small-scale coffee growers cannot invest in equipment or machinery to help them process their coffee produce, thus diminishing their profit. It is deemed that Coffee Growers Cooperatives or Organizations can perform better both consolidation and marketing for the individual coffee growers. Atok Arabica Coffee Growers and Marketing Cooperative (ACOGMAC) and the Kibungan Arabica Coffee Growers Multipurpose Cooperative (KACGMPC) are examples of strong Arabica grower organizations in Benguet, which serve as marketing outlet of its growers. In this case, they do not allow outside buyers, at least in their areas of work. ACOGMAC has ATOKAPE as its market branding. The cooperative does not only market the coffee beans. It also observes

proper processing, sorting, and grading of the coffee beans so they can demand a higher price. The cooperative utilizes machinery or equipment to process the coffee beans. These equipment were either given by government line agencies or were investments of the cooperative. As a cooperative, members undertake all the work, mostly the women members – specifically grading and packaging the product before marketing. Those who work serve as seasonally paid employees of the cooperative. As cooperative members, they receive various benefits from the cooperative such as loan assistance, free training, and rebates and assistance from line agencies, and NGOs.

Social-Cultural Aspects of Growing Coffee

Cultural Factors. The cultural aspect of growing coffee can be rooted in the tradition of backyard growing "left-on-their-own" coffee trees, where generations have witnessed its continuing growth and yield – without any human intervention. Legend has it that when the old drink the pounded beans with its aroma, it gives them renewed energy, especially if drank with a group. This social drinking is usually the case in the Cordillera, where coffee drinking is a must in a social gathering, usually during nighttime, and is an alternative to rice wine. Coffee trees are said to naturally grow in everyone's backyard or at least be seen in every household backyard. It is also common to just pick, dry, pound, roast, and drink coffee. Coffee in this context is mainly for home consumption. It is also said that coffee trees that grow tall are usually hit by natural climate disturbances such as typhoons but recover quickly and when the tree recovers, and even more robust. This account adds to the "magical" character of coffee that is not even cultivated as it is always left-to-grow on its own, and comes with the belief that "Kabunyan" takes care of this crop. Perhaps this makes elder members passionately fond of this plant that they do not accept 'pruning' as a rejuvenation technology. Even an informant who grows coffee for the market admits that his initial reaction to pruning technology was negative and laughs at the idea that "to prune is to rejuvenate". She says "*imula-mulam sa monto pukanen*" (maybe translated as 'why, you planted it just to have it cut'). Continuous fruit-bearing is also observable – which somehow influences the thinking about coffee as '*mulan di Kabunyan*' (a plant from God). The prolific character of coffee trees is supported by studies that proved Arabica tree can bear fruit continuously up to 50 years, when it will start to decline (CIRAD, 2019). Data from Tublay also show that coffee trees are most productive between eight to 20 years of age, where each tree can bear two to three kilograms of coffee cherries.

Believed to be a gift from *Kabunyan* passed down from one generation to the next, this long tradition of coffee trees growing by themselves and providing coffee to every household is in place. Initially to cut coffee trees is circling the principle of conservation, with the cultural expression of inayan a socio-cultural control mechanism of excess behavior using resources.

On the other hand, data show that upon closer look, a technique observed by older informants of the practices of their old kin, reveal that older women swiddeners usually cut the lower branches of coffee trees by simply stumping on it until it breaks; or simply bending branches "that are too much." The reason given is "so that these trees will rejuvenate". This finding reveals that pruning is not new, after all. What is perhaps new and being resisted (at least by the older population) is the pruning technique that includes cutting off the top of the tree and not just the branches below.

Yet as observed, the technology promotion of pruning progressed slowly. Those who have recognized the cash returns from coffee and the benefits of coffee learned slowly to 'cut' in the context of pruning as a technology for rejuvenation. Informants would justify this as the "needed technology" in changing times. They would attribute economic benefits to the coffee trees. *"Haan kami makaraman ti bagas nu awan ti kape"* (We would not be able to eat rice if we have not sold coffee beans). Another informant who lives with her mother, who was against pruning, would narrate how she also negotiated the taboo attached to coffee trees. She narrated that in the aftermath of typhoon Lawin, some standing coffee trees were left. She took the chance by massively trimming the outer branches and treetops that were broken by the wind accompanying the typhoon. She justified these pruning as "clearing the fallen branches as a result of the typhoon," hence had not heard any negative feedback from her old mother. After some time, she witnessed new regrowth and rejuvenation. In this context, the cultural taboo of cutting/pruning coffee trees somehow has benefits – this is observably the

reason why century-old coffee trees are still intact as they are spared from land conversion. This observation is more true in Mountain Province.

Gender Dimension. As far as the gender dimension is concerned, both men and women are reported to play cooperative roles in the industry. For example, for respondents who have established nurseries, maintenance is tended by women, and the husband mainly does its establishment. Accessing resources for coffee establishments, including trainings that come with it, are usually participated in by women. When it comes to post-harvest activities, division of labor is expressed - both men and women perform de-pulping, sorting, segregation, and de-hulling, although women mostly do these tasks. Carrying and climbing tasks (when coffee trees are tall) are conducted primarily by men since it is considered a 'heavy task.' Labor cost for harvesting ranges from Php300 to Php400 a day, and weeding tasks get lower at Php250 to Php300 daily. Processing of coffee, however, show more women participation.

Concerning organizational management and governance, the Chairman, Vice Chairman, and manager of ACOGMAC are all men, and of the four (4) Board of Directors, three (3) are women. The Regional Coffee Council (RCC) also has a male chairperson. The RCC is one mechanism of institution building of the coffee industry. As to membership, the Atok Coffee Growers Marketing Association Cooperative (ACOGMAC) has 147 women and 111 men. On the other hand, women leaders manage the Kibungan Arabica Coffee Grower Multi-Purpose Cooperative (KACGMPC) and Tuba Benguet Coffee Growers Association (TUBENGCOA). It is observed that women mostly attend the trainings. This observation was also validated by male members who agree that they usually send their wives for trainings or that the women are the ones who consistently attend training and seminar activities. Women also dominate in the processing and semi-processing tasks as part of organized marketing and consolidation. As members of the cooperative, these women are hired seasonally; thus, also generating employment.

For individual growers, coffee processing is done manually and traditionally with the use of mortar and pestle. There are no distinct roles between genders as both are said to perform varied tasks in coffee growing and harvesting.

Problems Encountered. From the given production and marketing dynamics of the Arabica coffee industry, a summary of the issues and concerns confronting coffee growers are as follows: (a) shifting of coffee areas into more visible in-demand crops; (b) use of wildlings as planting materials; (c) century-old coffee trees are left without rejuvenation; (d) coffee as 'side crop'; (e) local demand still cannot be met; (f) insufficient Arabica promotion; (g) pests and diseases; and (h) natural calamities.

For pests and diseases, coffee trees require minimal use of synthetic chemicals, and no respondent claimed to have used fungicide, except for some who occasionally put fertilizer. These fertilizers, if ever applied, are usually just left over from garden plots. Informants mentioned common pests such as stem borer, berry borer, and *bengag* (local term for a bird that eats ripe coffee berries). These pests sometimes lead to mandatory rejuvenation by pruning, as claimed by respondents. A farmer from Buguias said that burning or smoking around or near coffee trees help get rid of pests. Urea and complete fertilizer are also applied whenever necessary.

With the increasing need to look for cash, land areas for agroforestry, including coffee trees, have been cleared in favor of semi-temperate vegetables. In Mountain Province, informants said that swidden and hilly areas that used to be devoted to coffee trees and bananas combined with other food crops had been converted for yellow corn production. Officials of various line agencies have articulated that semi-temperate vegetables bring in ready cash every cropping period, much shorter than coffee beans, enticing growers, and potential growers with vegetable growing despite the known risks.

Natural calamities such as typhoons can indeed have a significant impact on coffee trees. Knowing that Benguet and Mountain Province are typhoon and landslide-prone areas, a farmer from Kibungan said she lost one-fourth of her plantation due to a landslide in the recent Rosita typhoon (2018). In addition to this, too much rain and wind during the fruiting and flowering stage results in flowers falling off and remaining berries turning black, which entails huge losses for the coffee grower. During the recent typhoon Rosita, it

wiped out one coffee plantation in Tuba, Benguet. During the 2017 typhoon Lawin, it massively caused landslides in coffee plantation sites in población Kibungan. According to the DA-CAR estimate, it will take at least two years for the damaged coffee trees to recover.

DA-CAR recorded losses of the industry due to typhoon Ompong, which occurred in September 2018. Benguet lost about 959,858 Arabica coffee trees either at reproductive or maturity state with 0.60 kg average yield/tree. The estimated yield loss in kilograms is about 65%, amounting to Php56 million. In Mountain Province, they lost about 338,400 trees at 1.00 kg/tree, which amounts to 219,920 kgs loss or about Php17.5 million worth (DA-CAR, 2018).

Major Players in the Local Arabica Coffee Industry

From the data, two types of players presented themselves as models that worked in Benguet and Mountain Province. This argument's take-off point rests on the assumption that the industry is 'slow' in meeting its targeted outcomes based on the Coffee roadmap. There are, however, interesting micro cases where these players seem to perform well, despite challenges. This section will present two models: the cooperative type model and the individual entrepreneur.

Cooperative Type of Production and Marketing. Atok Coffee Growers and Marketing Cooperation (ACOGMAC) started in 1995 as Atok Coffee Growers Association with only 30 members and was only established and named ACOGMAC in 2009. It has the goal of consolidating coffee products in Atok and maintaining the quality of Atok arabica coffee. In 2016, this cooperative grew with 237 members (Peace and Equity Fdn, 2016). By 2019, it has 280 members with consolidated coffee farm land capable of producing 700 to 800kg per y ear.

ACOGMAC maintains 10 hectares of coffee trees with typica, red bourbon, yellow caturra, and granica as the cultivars being grown. It also boasts recent gains such as attaining a grade as specialty coffee with an 87.06 grade during the Philippine Coffee quality competition in 2018, surpassing the 80-point mark for specialty coffee. This achievement is remarkable considering that ATOKAPE made its mark among 38 entries. In a 2018 interview, recognizing that growers do not always have the time to semi process their beans, ACOGMAC plans to buy fresh berries at P50/kg for better and advance processing. At the time of writing, it buys parchment coffee at P210.00 and processes it for better quality and the wider market.

The Kibungan Arabica Coffee Growers Multi-Purpose Cooperative (KACGMPC) marketing practices are similar to the ACOGMAC. The cooperative buys GCB from its farmer-members then further processes the coffee. As observed, farmers bring their GCB for storage at the KACGMPC building, which also serves as their market outlet. Their markets are limited within their locality, but they also have buyers from outside the municipality. These buyers are from the Baguio coffee shops, processors like Rocky Mountain, Kalinga blend, and the Benguet State University. A repeat buyer from Iloilo was supposed to buy coffee from them for another cycle, but it was interrupted by typhoon Lando. Typhoon Lawin destroyed many of their coffee trees. Due to the natural calamities, KACGMPC was only able to deliver twice.

ACOGMAC and KACGMPC also sometimes supply coffee beans to other organizations in the region. For example, the chairman of the ACOGMAC said that while the Sagada Arabica Coffee Growers and Processors Cooperative (SACGC) was the first to popularize Arabica coffee, it still experiences a supply shortage. When their supply is not enough to meet customer demands, informants claim they buy ATOKape from ACOGMAC or even the Kibungan coffee arabica. The informants narrate these events with amusement and some concern, particularly the creation of false marketing/advertising, especially when labeled differently. However, they say it is only the brand that is 'false' because the quality of the Arabica coffee is not in any way compromised. The KACGMPC manager also narrated a time when the Kalinga Blend coffee marketing organization also experienced a shortage and had to access GCB from Kibungan.

Nevertheless, these two marketing associations consider these other marketing organizations in the region as additional market outlets to help their coffee growers further. This type of effective cooperation among smallholder organizations are seen to be an important strategy in agri-food

supply chains in developing countries (Naik & Suresh, 2018). Ruben et al. (2006) also underscored that local smallholders could better compete if embedded in institutional partnerships that enable network coordination and strengthen entrepreneurship. Accordingly, constant and reliable supply is an essential condition in agro-food chains.

Conditions that Spring Cooperatives to Action. Organized coffee production and marketing are but the appropriate system because coffee growers are smallholder farmers. Their GCBs are being bought and priced lowly based only on the 'look and feel' method of traders. Left alone as individuals, they can never compete or command a better price for their coffee, which has been the case for many generations. Farmers need to be organized in production and marketing to make a significant impact. The coffee industry roadmap already identified areas that need improvement: packaging and branding, which also entails quality control. The conditions/efforts below will highlight practices that are slowly building the region's coffee industry.

a. Coffee is a homegrown enterprise. Growing coffee has always been close to home, first for home consumption until it evolved into a commercial scale. Stories and recollections always point to coffee as a regular brew in the Cordillera villages and that it was able to contribute to funding the education and mobility of locals then. The existing coffee trees and the areas these trees occupy become the capital when transforming this homegrown industry to a commercial scale. The cases of Atok and Kibungan show that coffee trees thrived as a backyard crop if not a swidden crop as far back as informants' memories are concerned. ACOGMAC's 10 hectares or so coffee plantation was built on century-old coffee trees and expanded when coffee Arabica has become the most sought-after cultivar until it became a major source of livelihood. The cooperatives ACOGMAC, SACGC, KACGMPC, TUBENGCOGA, and TOFPA have acted as consolidators for these homegrown enterprises. All coffee beans gathered are brought to the cooperative for processing and marketing. Locals, usually women, are employed to sort, dehull, dry, depulp, and even roast and pack. The cooperatives now engage in 'organized marketing' to command a better price and provide producers alternative market options. This organized marketing certainly offers a much better price than traditional market outlets. ACOGMAC, for instance, can buy GCB from its members at Php180/kilo per ton compared to Php120/kilo by retail. This service is an important support mechanism provided by cooperatives because coffee beans are marketed and bought at a higher price.

As these organizations work as cooperatives in the real sense of the word, incentive is part of the package, one mobilizing factor for its members. As one informant stated, *"maymayat tatta ta cooperative ket mailak-lak-am ta ti benepisyo malaksid pay iti nalaklaka nga mangilako ti kape. Haanen nga kanya-kanya"* (It is better this time as we work as cooperative, we share in the benefits aside from it is easier to market of our coffee…it is no longer minding your own coffee, but coffee as a collective endeavor). Coffee growers who are members of the cooperative feel the inclusivity of the industry as they participate in the whole process of production up to packaging. The realization of the need to 'join hands' as a cooperative is evident.

b. Institutional partnerships. With coffee dubbed as one of the regional commodities, investment in the industry has become attractive. With production as one major target in the regional industry plan and in the roadmap, institutional arrangements need to focus on farmers. Paired with institutional stakeholders, community members who stand out as leaders painstakingly poured efforts to revive the Arabica association, which finally bore fruits with a new name. Now, they are partnering with different groups simultaneously: PhilMech for trainings on the use of modern postharvest technologies, BSU for technical assistance and trainings, DA-CAR & DAR for management formation of cooperatives, DTI for post-harvest equipment, NGOs for trainings and seed capital. These partnerships certainly helped in boosting the industry by capacitating coffee farmers. The Peace Equity Foundation (PEF), the CGN, and other NGOs have also provided technical, credit, and seed assistance.

c. Mainstreaming IKS in the coffee-based production system. Production system up to harvesting optimizes natural or organic production system in agroforestry set up, an upgraded version of the swidden in the old days. With trainings and Information, Education, and Communication (IEC) materials, growers become

motivated because the introduced production systems such as multi-cropping and agroforestry are not far from what their ancestors have been doing. Only, this time high-value crops such as anthurium, ginger, vegetables are introduced as understories, while Alnus, mango trees, pine trees serve as shade to coffee trees as have always been practiced.

Interestingly, coffee, most often recited as *'mulan di Kabunyan'* (plant being cared for by God) is no longer seen as just a backyard crop left on its own to grow, but a crop that also needs proper management. The advocacy of rejuvenating old trees, although receiving some resistance from older coffee growers due to particular cultural meanings associated with cutting or pruning, is now making a dent. There is already a recognition of the need to cap, prune as part of improved coffee farm management but still building on the folklore of favoring *Kabunyan's* way of caring.

Apparently, these communities have noted the importance of going back to agroforestry, an age old practice that has become marginal with the introduction of monocropping. Knowledge and information on what crops are suitable to combine, what cultivars to grow, including soil conservation practices, have always been part of their indigenous knowledge systems.

d. Market links and branding. The good thing about cooperatives is that they tend to be aggressive in establishing market links. They can capitalize on the increasing demand for Arabica coffee and the support that the government and NGOs are providing. One can no longer see just the Garcia and Umali market links. Numerous private companies are rising and even going to the growers' farms and offer to pick the berries themselves. The challenge of quality control, especially geared towards specialty coffee, is also making a significant mark on the grower's mindset.

Marketing comes with branding so that ACOGMAC's Atok Kape and TUBENGCGA's honey blend coffee are making waves. Perhaps what helped in the branding is rootedness. With Atok Kape or Sagada gold, consumers can move to the "mountain/green gold" perspective. It capitalizes on tradition and rootedness, making the Arabica coffee more 'magical' so coffee shop owners would say.

e. Cultural and formal promotion. Promotion of growing Arabica coffee finds its way to LGUs integrating it in barangay ordinances. Newly married couples are required to plant coffee trees, which serves as the couple's first conjugal act. As the challenge of attracting the younger generation to continue producing coffee trees becomes real, the cooperatives find ways to educate potential growers by partnering with the Department of Education Senior High Schools to require students to engage in a project inventorying the coffee trees. This exercise forms part of their science project as the inventory of trees in the locality will also create ways to embed morphological and ocular characterization in the process. Cultural management of trees following science-based techniques such as pruning, capping, and fertilizing are also taught in the package of inventorying exercise.

The Individual Self-made Entrepreneur. Another key player at the ground level is the individual entrepreneur. In Mountain Province, Ola Kape (Ola Coffee Farm) of Western Mountain Province and Ashley Lamaton of Eastern Mountain Province figure in the scene. Unlike the more organized cooperatives, these individual entrepreneurs work as producers, consolidators, marketers on their own, performing almost all aspects undertaken by cooperatives. These cases started with some assets at hand – defined areas devoted to coffee, access to support groups, government, and non-government organizations, and the commitment to combine indigenous and S&T farming approaches. For example, Ashley Lamaton maintains a backyard coffee-based agroforestry of more than a half hectare while having a trading business in his barangay. Ola Farms maintains more than two hectares of coffee trees located in a forested area, ideal for agri-tourism.

Ola coffee farm is managed by Jennifer Rimando, who said her father owns the farm. It is more than two hectares of coffee-based agroforestry in Aguid, Sagada. Jennifer claims she was inspired by her father, who for the longest time, has been convincing her to join him in working on the farm. Back in her earlier years of married life, Jennifer and her family were in the city and was then a daily paid worker. As a salaried worker, she said she never had savings. The turn of events that led her to go back to her village was when she went home broke after her

child's hospitalization. This circumstance led her to respond to her father's invitation, who was then starting his coffee farm. With only the will to make good in farming, she brought home her family to Sagada. As a newbie in modern agriculture, she actively participated in the village's farmer organization's activities. This participation was her first exposure to the coffee industry. She recalled she even participated in crafting a proposal requesting processing equipment for funding by the government – only to receive equipment that was too sophisticated for use by their organization. Looking back, she said the proposal was rushly done due to the last minute call they responded to and that it was not really based on what was needed. Government bureaucracy such as procurement also was hinted at as perhaps one problem. She also realized that while organizations can be a springboard to local development, she also learned that the group consisting of so many individuals with many interests could also get in the way.

At that time, she said she wanted more – so she started becoming more concentrated on her family farm. She took advantage of every opportunity given—trainings, seminars, and volunteer work, while still making extra effort to tend to her farm. Today she is one of the few Q graders in the region, and the Ola farm is a Learning Site certified by DA-ATI and, not long after, is also a TESDA accredited training site. She was also successful in making her farm become an agri-tourism farm, with visitors already frequenting her farm.

Recognizing the need to package and maintain her coffee products' quality, Jennifer also boasts of processing her own green beans, carefully selecting, sorting, even roasting and packaging her coffee beans. She said she has to do this to maintain coffee quality and traceability. In the first place, she is a known Q-grader in the region, a status that only a few can achieve, and every visitor can have a taste of her freshly brewed coffee. From informal conversations with her, one can sense that as an individual entrepreneur, she is spared from the problem encountered by organizations that consolidate green beans – difficulty in traceability as some members are not keen at on harvesting and sorting techniques.

One can see a 'visionary entrepreneur' – her willingness to learn and aggressiveness to invest in producing quality coffee using S&T that convinced government and NGO to partner with her. Her Ola farms is now an Organic Arabica Learning site and she has her own brand "Madchikom kape brand" - del Ola kape brand.

In the case of Ashley Lamaton, aside from being a local trader and farmer, he is also a designated Magsasaka Syentista (MS) in 2010 for his heirloom rice production, the OTOP of the FITS Center under PCAARRD-DOST. An MS is an outstanding farmer recognized for his/her use of S&T based and indigenous technologies. He later shifted to coffee production and in 2017 received certification from ATI-DA as Learning Site in Agriculture (LSA). As a farmer leader, he has been exposed to various institution arrangements and networks. In response to opportunities provided by CGN and the Department of Agriculture and later the DTI, Lamaton later has to reallocate his resources to engage in coffee processing and marketing while still doing rice farming. Investing in a partnership with CGN and seeing the viability of coffee, he was able to market his packaged specialty Arabica coffee to Japan. Packaging his beans into specialty coffee was a daring engagement at that time and a promising endeavor as it is also a form of strategic marketing. For a time, Lamaton has engaged in producing specialty coffee. However, he expressed difficulty sustaining the standards, especially of the 'traceability' issue since he also consolidates green beans in his community. Another challenge is that growers in this part of the country are already shifting to citrus production. He is, however, thankful for the skills he learned especially in coffee processing – and the importance of post-harvest in the industry. Notably, Mr. Ashley Lamaton and Ms. Jeniffer Rimando, and her grandfather had their training at the BSU-Insitute of Highland Farming Systems and Agroforestry when they were still starting.

In Agrawal and Gibson's (1999) definition, institutional arrangements include formal and informal rules that shape interactions between people and the environment. They argue that rather than look at communities as homogenous entities, one should look at the multiple actors and interests within communities, including external and internal forces that influence decision making. In this framing, the study found out that the regional target of increasing production by 2.3kg/tree is being met, albeit very slowly – because

of the assumption that coffee growers are homogenously just growing coffee trees. The fact is that coffee growers are also growing vegetable cash crops; these targeted farmers have other varied interests, which is part of getting by economic pressures.

Other realities also surround the coffee industry, such as technologies and politics, varying agenda among others, which also become factors shaping the way producers respond to share the dream of making Arabica the preferred coffee in the market. In this case, both the individual entrepreneur and the organized groups through cooperatives have responded quite well but not without difficulties – they have negotiated (rather than just passively accept) their way through their specific contexts and practical needs. Interestingly, both models show an active use of resources and support provided in the industry and have taken advantage of whatever window of opportunity and learn to make way whenever things get in the way. For example, it is common to hear that concerned line agencies' equipment provision is always accepted even if it is not readily functional. *"Haan nga dagus mausar ta adda kurang na…kasla isun a ti counterpart mi ta ipa-repair mi pay…"* (We cannot use the equipment immediately because it needs to be repaired first … and we consider the expenses for repair as our counterpart). These frustrations have become part of the game, and rather than give up, players have learned to play well and do their part.

Conclusions

The increase in coffee production is insufficient to meet the increasing demand for coffee in the region, country, and the global market. Some factors that affect coffee production are the very few seedling sources or accredited nurseries, and inadequate and less effective processing technology, or even the unrealistic targeting set in the industry plan.

There is a very promising market for Arabica GCB, particularly in specialty coffee markets, that can command better prices. Small-scale coffee growers cannot take advantage of the growing demand for coffee because they lack resources. However, organized markets such as coffee growers' cooperatives or associations effectively and efficiently promote and market the coffee products from their locality. An emerging player is the 'individual entrepreneur' who seems to be more flexible and can autonomously take risks, a needed element in the industry. Necessary conditions to facilitate this model are certain assets: coffee trees that can provide volume output combined with a visionary manager.

Recommendations

Establishment of more accredited nurseries and assistance to small-scale coffee growers and coffee grower cooperatives in the purchase and maintenance of appropriate machinery or equipment needed to process coffee.

Organization of a coffee center devoted solely to assisting and supporting coffee growers in terms of programs in the production and processing of coffee, in marketing particularly in the grading and promotion of their coffee products, and especially in the determination of market prices for the different classifications of coffee.

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References

Allad-iw, A. (2007). Cordi Fast Becoming RP's Arabica Coffee Capital. *Northern Dispatch*. https://www.bulatlat.com/2007/12/23/cordi-fast-becoming-rp%E2%80%99s-arabica-coffee-capital/

Agrawal, A., & Gibson, C. (1999). Enhancement and Disenchantment: The role of community in Natural resource Conservation. *World Development*, 27 (4):629-649.

Chaves, C.M.C. (2011). In the hands of Indigenous People: The Future of Upland Coffee Regions in the Philippines. *Review of Women's Studies,* 21(2): 29-50. https://journals.upd.edu.ph/index.php/rws/article/view/4280

Dado, N. (2019). Benguet Arabica: Our heritage, and its history. *Agnep Heritage Farms.* https://benguetarabica.coffee/2019/07/29/benguet-arabica-history/

Department of Agriculture - Cordillera Administrative Region. (2002). CHARM Project Report. Powerpoint presentation. 2nd CHARM meeting.

Department of Agriculture - Cordillera Administrative Region. (2013). Quality Enhancement of Coffee Production from seed to cup. Powerpoint presentation of Dir. C. Odsey. RDC Regional Hall. 2018 RDC Sectoral Committee on Economic Development meeting.

Department of Agriculture - Cordillera Administrative Region. (2018). Oral presentation of Dir. Odsey during the RDC Sectoral Committee on Economic Development Meeting.

Department of Agriculture - Cordillera Administrative Region. (2019). Powerpoint Presentation. Regional Coffee Council Meeting.

Department of Trade and Industry. (2016). Coffee Industry Roadmap Localization. http://industry.gov.ph/wp-content/uploads/2016/08/Coffee-Industry-Roadmap-by-Regional-Director-Myrna-Pablo-DTI-CAR.pdf .

Departmenet of Trade and Industry and Department of Agriculture. (2016). 2017-2022 Philippine Coffee Industry Roadmap. https://www.da.gov.ph/wp-content/uploads/2019/06/Philippine-Coffee-Industry-Roadmap-2017-2022.pdf

Ferstl, R.A. (2009). *Production Guide for Arabica Coffee*. Bote Central Inc. - Serenity Coffee Corp.

French Agricultural Research Centre for International Development. (2019). Agricultural Research and Development. https://www.cirad.fr/en/our-research/tropical-value-chains/coffee/plant-and-uses

Haile, M., & Kang, W. (2020). *The Harvest and Post-Harvest Management Practices' Impact on Coffee Quality*. In DT Castanheira (Eds.), Coffee Production and Research. https://www.intechopen.com/books/coffee-production-and-research/the-harvest-and-post-harvest-management-practices-impact-on-coffee-quality

Idaho, R.G. & dela Cruz, R.S.M. (2011). Improved Postharvest Technologies for Green Coffee Beans. Monthly Agriculture. https://www.agriculture.com.ph/2018/03/31/improved-postharvest-technologies-for-green-coffee-beans/

Macanes, V.L., & Luis, J.S. (2006). Assessment on the Occurrence and Severity of Diseases Infecting Arabica Coffee. *BSU Research Journal*, 53: 46-86.

Mountain Province- Office of the Privincial Agriculturist. (2017). Annual Report in Agriculture.

Naik, G., & Suresh, D.N. (2018). Challenges of creating sustainable agri-retail supply chains. *IIMB Management Review*, 30(3); 270-282. https://www.sciencedirect.com/science/article/pii/S097038961830154X

Olofson, H. (1981). *Adaptive strategies and change in Philippine swidden-based societies*. UPLB: Forest Research Institute

Pablo, M.P. (2012). Coffee Industry Road Map Localization. Powerpoint presentation. http://industry.gov.ph/wp-content/uploads/2016/08/Coffee-Industry-Roadmap-by-Regional-Director-Myrna-Pablo-DTI-CAR-1.pdf

Peace and Equity Foundation. (2016). Scaling up Social Enterprises. https://pef.ph/what-we-do/

Philippine Statistics Authority. (2017). Volume of Arabica Production for 2013-2017. Benguet.

Philippine Statistics Authority. (2020). Major Non Food and Industrial Crops. *Quarterly Bulletin* (April-June 2020). Vol. 14 (2). ISSN-2094-6198. https://psa.gov.ph/sites/default/files/Publication-Bulletin-MNFICS-Q2-2020.pdf

Regional Development Council - Cordillera Administrative Region. (2016). Cordillera Coffee Industry Development Plan, 2016-2022.

Ruben, R., Slingerland, M., & Nijhoff, H. (2006). Agro-food Chains and Networks for Development: Issues, approaches and strategies. Springer Netherlands.

Tad-awan, B.A., Doco, J.D., & Amado, V. (2013). Growing Areas and Traditional Production Practices of Arabica Coffee in Benguet. *BSU Research Journal,* 70: 34-63.

Velasco, D.N., Madamba, J.B., Mojica, L.E., & Williams, J. (2016). Disaggregating the coffee industry supply chain network in Benguet, Philippines: A step towards understanding relationalties. *Journal of Global Business and Trade*, 12(1): 23-36. http://scholar.dkyobobook.co.kr/searchDetail.laf?barcode=4010024860467