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The from farm to cup speciality coffee trend in Thailand and Vietnam. A major assumption about shortening supply chains disproven?

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Abstract. Shortening the supply chain of speciality coffee between farm and cup has often been spoken of as an aspiration. This study aimed to discover whether that aspiration has translated into a reality in Thailand and Vietnam. If supply chains have shortened the question then became what are the benefits and dis-benefits of that and to whom? A summary of that mainly focused on farm incomes as increased, and product quality increased, but prices also increased. The Importance of the last is that it entirely contradicts classical supply chain theory that sees prices to the end consumer falling as the number of intermediaries along the supply chain reduces.

Keywords. Supply chain, Agricultural, Food, Speciality Coffee, Arabica, Coffee, Thailand, Vietnam, Supply, Chain

Introduction

A little background is that both Thailand and Vietnam have significant coffee industries, Vietnam's being second largest in the world, only bettered by Brazil. However, volume production in both Thailand and Vietnam is of commodity robusta coffee bean, meaning literally a globally traded commodity where one lot is interchangeable with another. No lot has particular intrinsic merit and traded prices are low, albeit volumes high. Such coffee is usually destined to be coffee powder as its destination. The powder might, for instance, be used in the home to make an instant coffee though substantial quantities are used in commercial food production, cake-making being an example.

However, both Thailand and Vietnam have limited areas planted to arabica coffee plant stock. Arabica is a second varietal, associated with individual flavour attributes but those deriving not simply from the bean but many other factors. Examples are the nature of picking the cherries, and how the bean is processed after picking both on the farm and subsequently by the roaster. Perhaps the terroir on which the coffee plants are grown is most important, meaning for example, the altitude at which the plants are raised.

Figure 1. Thailand's Coffee Production by Area and Coffee Bean Type

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In Thailand Arabica coffee bean is associated with the regions of Northern Thailand, around Chiang Mai and Chiang Rai, as shown in figure 1.1 above, and close to the borders with Myanmar and Laos. There is also a small amount of Arabica growing in Nan Province, again in the North of Thailand. In fact one farmer interviewed for this study farms in Nan Province. Lamphang and Tak are two further provinces where Arabica coffee bean is grown, but these are essentially outliers.

Historically this region was associated with slash and burn cash-cropping of opium poppy, essentially by hill-tribe peoples. His Majesty King Bhumibol Adulyadej of Thailand beseeched people of the region “"Don't grow opium, it yields little profit and can only be grown once a year, instead, grow peaches, coffee and cold-region crops and get year round profit." (“A Royal Trip”) His Majesty, through his personal fund, established the Royal Project which commenced its works in 1969. Initially, Arabica coffee plants were given away, but the project proceeded mainly by education and training and through a planting suitability project with Kasetsart University. Arabica bean was chosen, despite low yields and susceptibility to disease , for its suitability to the high, cool, mountain climates and suitability to multi-crop shade coffee production including interplanting, not to mention for sustainable outcomes. Arabica was also chosen as a high value crop, a point that has proven highly prophetic with the rise of demand for speciality coffee as a specific, where premium prices obtain, but also with the general rise in espresso and espresso-derivative coffee drinks, originally associated with Italy. Arabica planting raises farm incomes.

Thai arabica coffee has established itself as a lucrative, legal and reliable cash crop for instance for Akha hill tribe farmers (“Thai Arabica”). Speciality Arabica production is now developing so successfully that two areas, Doi Tung and Doi Chang, hold European Union PDO status (Protected Designation of Origin).

The growing aim here is likely to be deemed speciality coffee. Such coffees will have achieved a cupping (tasting) score of 80+ adopting a set of criteria devised by the Speciality Coffee Association.

In Vietnam the cool area in the Central Highlands (Lam Dong province) around Dalat is associated with Arabica production. Again, speciality Arabica is quite likely to be the growers’ aim, though there is currently a limitation on varietals available. Catimor, the most readily available varietal, is unlikely to produce high cupping values (“Vietnamese Coffee”).

Figure 2. Vietnam’s Production of Arabica Coffee Bean in Lam Dong Province

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The clearest indication of a shortening of the speciality coffee supply chain anywhere is close relationships developing between farmers and roasters/coffee shops. This is true for both Thailand and Vietnam and is lauded by those involved in speciality coffee production and bringing to market in both countries. The measure of both the relationship and its success often offered is rising farm income, albeit stated in very imprecise terms. One Vietnamese roaster and coffee shop owner in this study, for instance, offered that a farmer working closely with her could easily treble their income.

Another Vietnamese speciality coffee business leader, though, engaged in some lengthy personal communications (Dao Tran Phuong, personal communications, July 4, 2021 and July 18, 2021) with the researcher around the fortunes of a specific farmer over the years from the two men becoming involved with each other in 2015 to develop the farmer's business and help his village of ten families. The business fortunes of farmer Thiet were recounted as below:

Table 1. Farmer Thiet's Income in Dien Bien

	Coffee Cherry Production in Kilograms	Coffee Cherry Income X1000 VND	Bought in (from village) Coffee Cherry Processed Income X 1000 VND
2015	50	300	24000
2016	No Local Harvest	No Local Harvest	No Local Harvest
2017	200	1100	34000
2018	250	1375	38000
2019	300	1650	42000

Source: Oriberry Company Data 1000 VND = 0.04 $US

Even in the internet age there are very few attempts by coffee farmers to sell direct to the public, That may though happen through farmer owned coffee shops (including bean sales), often embedded within agritourism initiatives. Accommodation may also be provided. Lee Hu Coffee in Chiang Rai is an initiative that embraces arabica coffee farming, other farming elements, such as avocado, coffee shop and farmstay. Very occasionally there may be farmer-owned shops in unconnected places. For example Doilanka Coffee Shop, Sukhumvit Soi 1, Bangkok, was a company owned and managed Bangkok sales outlet for Doilanka Coffee Plantation, a Northern Thai coffee grower based in Lampang Province.

Literature Review

Deshmuk and Vasudevan (2014) considered the automotive industry's traditional supply chain as consisting simply of the five elements component/raw material suppliers, manufacturers, wholesalers/distributors, retailers and customers, with that chain concentrated on cost and the final product, economic concerns. The writers now see the sector as ecologically concerned, having an additional concern in environmental protection as a matter of increased regulation, together with competitive and community pressures. An economic approach, often very short-term, is no longer sufficient. The longer view embraces sustainability of the company along with sustainability of the planet, in fact the two inter-dependent. An obvious example of the pressure on the automotive industry is that sale of new internal combustion engine powered vehicles will be illegal as of 2030 in UK.

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That example is purposefully chosen, seemingly far-removed from food and beverage. However, Naik and Suresh (2018) similarly conclude, these days, "growing pressures on businesses and governments to pay more attention to the environmental and resource consequences of the ever-increasing production, distribution and consumption of agro-based products." Indeed sustainability of the food supply chain is seriously questioned in the face of levels of global population and consumption trends, the latter in terms of both levels of consumption and changes in consumption types. Perhaps there is a move exemplified by, say, the rise of farmers markets away from highly processed factory-produced foods toward higher quality, more nutritious, fresher and healthier foods. Blay-Palmer (2008) has spoken of growing demands from consumers to change the food that they eat. Equally, though Governments are active in many areas, such as food safety and quality regulations. Both call the food industry to developmental action, often the trigger being health concerns, but also broader environmental ones. Since September 2017 Thailand has had a tax on sugary drinks and taxes on salty snacks are scheduled to begin in 2021. Barrett (2007) concentrates on considering vitamin c loss in transit. Nutrient loss in transit is difficult to consider as it depends on particular fruit and vegetables, on mode of transport, on whether the plant material is whole or cut, and how or if it has been treated pre-transit (Barrett, 2007). Vitamin c losses in vegetables stored at 4 degrees centigrade for seven days range from 15% for green peas to 77% for green beans. Getting fruit and vegetables to plate is a battle against time, time reduced as the supply-chain is shortened.

In terms of the broader environment, analysing environmental impact of travel distance, Jones (1999) considered dessert apples sold in UK comparing local apples with those imported from New Zealand. Apples from New Zealand involved a 3,000 per cent higher level of energy use compared to the UK apples and an 87 per cent higher level of carbon dioxide emissions.

A short supply chain, featuring few intermediaries, may have economic consequences too, including a changed balance between elements in the supply change. Put at its simplest some elements may fare better economically, some worse, in the new structure. A common view has been that intermediaries from the supply chain price to the end-user will go down. Harun Khan (Naik & Suresh (2018) put it thus: "The usual reference to 1-2-3-4 in supply chain is quite well known, where what the producer sells for one rupee, by the time it reaches the final consumer, fetches four rupees due to the presence of intermediaries. Therefore, increasing efficiency of supply chain could help in bringing food inflation down and increase the efficiency of our food markets and make our agriculture sector sustainable and viable". The reference to efficiencies refers to the number of intermediaries. Lanfranchi and Giannetto (2015) undertook a farmers' markets case study in Messina, Sicily, Italy. They spoke of lower price to the consumer due to less intermediaries and distribution costs. Price savings of at least 30% were suggested and they also found reduced environmental costs, together with improved returns to producers. The consumer also gained in accessing fresher, healthier and seasonal food.

The point about lower price to the end consumer is a moot one and not proven in the current study (see below). However to consider benefits and disbenefits more widely than just price may be important and also highly reflective of changed consumer priorities. Firstly may be considered "the quality turn", consumer migration to focus on quality. Secondly may be considered the rise of third places, places of leisure and sociability, where what were simple transactions have come to contain a strong element of sociability (and maybe education too) for which the consumer is willing to pay a premium price, a price that contains an element beyond the simple transaction, the product purchased.

Overall, the point is not just product quality as an enabler of higher pricing but social opportunity, service environment, even retailer decor. The notion of purchasing locations being third places has been followed by a number of writers in food studies, including Oberholzer and Crow (2003), Azavedo and Walsh (2018) and Azavedo and Walsh (2019).

The "quality turn" is a phrase in extensive use in relevant academia and in retailing in all its guises, together with services. However, stating the meaning of the term is problematic in that so many attempts have been made at defining it by so many academics to varying conclusions. Kuraj (2019) saw the quality turn for food as looking to "traditional values in food production, ecological worth and animal welfare standards"

Biénabe, Vermeulen & Bramley (2011) speaking only of the quality turn in food, offer "the general turn from mass consumption to the increased qualitative differentiation of products". However, that definition may be widely applicable in retail and service industry. The focus there appears to be on differentiation which seems undeniable in such an age of the niche product and niche services. Speciality coffee is a perfect example of a niche product and arguably also a niche service. If price were a focus, premium prices are charged but for unusual, high-quality products, taken in an attractive, retentive, environment. In fact through the stringent definition of "speciality" by the Speciality Coffee Association the product is in limited supply, "exclusive" in a literal sense. Coffee bean provenance also limits availability, as in various foodstuffs and particularly wine, where localised appellations may apply.

A small Thai pasta-making business seems to project itself to the quality turn perfectly: "The success of our production comes from the technology of our machinery, the qualified staff and the use of the finest Italian semolina along with the purest water. The manufacturing techniques allow the wheat to preserve the proteins and organoleptic proprieties. Modern packaging equipment and quality control complete the winning formula in order to assure high quality and consistency. We are genuinely interested in giving you the best prices and quality in order to establish a long-lasting, profitable for both relationship in mutual respect and professionality." (Nina, 2021). In short a perfect amalgam of the finest provenanced ingredients with skilled staff and fine technology, with each element in that provenance fully described. Something is added, though, in the "best prices".

A core question is what is the meaning of best price, particularly is the lowest price the best price? Customers, in fact, are often willing to pay a premium price for a premium product. The customer's focus may be on good value (see below). Kawecka and Gebarowski (2015) bring forward the notion of favourable price-performance ratio. Obviously that is a summarising term albeit a useful one, in which their respondents must have raised a number of qualitative attributes to compute in their mind's eye against price, effectively determining quality against price. Kawecka and Gebarowski (2015) offer some illustrative consumer comments: "I prefer to pay more, but I have a good product", "shopping here is profitable for me, because everything is fresh and I do not waste products", "I can pay more for organic food". This sounds straightforward, but actually introduces the further issue of how does the consumer tell if a product is good? Perhaps a lot comes from learned experience in childhood, for instance where to prod, sniff or squeeze a fruit or vegetable, but that does not apply to less everyday products. Customers have to be actively tutored. See below, but also note that Azavedo and Gogatz (2021) found that all twenty speciality coffee entrepreneurs interviewed had as a motive to educate people about speciality coffee. This was evangelism, but likely also necessity or they may not have customers for this high-priced new to the customer product.

If quality is all important in speciality coffee it would follow that supply chain concerns would be focused on quality, in fact quality improvement. Within this study participants agreed (see below) that as their position on the aims within the speciality coffee supply chain in both of Thailand and Vietnam. It follows that relationships within the chain, say between farmers and roasters, are essentially quality-focused. An example known to the researcher, but not a participant in this study is Karo, a Bangkok roaster and coffee-shop owner who has characterised his task this year as improvement of his Fearless blend working closely with Leehu coffee farm in Chiang Rai, mentioned earlier, in detailed liaison over a new red honey processed coffee bean. The new bean should make the blend sweeter and fruitier, but is more of a challenge for the roaster. A slow rate of rise, simply raising of the temperature slowly and, anyway, relatively low temperature throughout is important.

The question then becomes if quality is the aim of the supply chain, what processes should be adopted along it to that end? Similarly the question must be asked as to the role of collaboration between the various stages in the supply chain to aid adoption of best practice processes for quality? Finally the development of a quality-focused supply chain must be considered in terms of hopefully positive outcomes for all participants in the supply chain, that is farmer, roaster, coffee shop and final end user with a coffee cup to their mouth in the coffee shop or at home, having brewed speciality coffee for themselves.

This research set out to answer these aspects through the two research questions:

1. Is the speciality coffee supply chain shortening in Thailand and Vietnam and what are the processes of that?

2. If the specialty coffee supply chain is shortening in Thailand and Vietnam what are the benefits and disbenefits to each participant along the supply chain from farmer to final end-use with a cup of coffee to his or her mouth?

Methodology

The study's methodology was interview-based qualitative data gathering with no pre-determined hypotheses. Rich case study detail was sort through a phenomenological perspective and inductive reasoning thereby adopted in a "bottom-up approach" (Braun, Clarke, Hayfield & Terry, 2018). Interviews were semi-structured, with plenty of time allowed for participants to pursue highly personalised answering, albeit that a rhythm was established both within the limited structure of the interviews and because participants tended to follow-on in predictable ways. For instance process improvement tended to be elevated in discussion, though based from elevation of process improvement in the relationships between farmers and the other parties. Analysis was through Reflexive Thematic Content Analysis (Braun & Clarke, 2019). There was a particular concern to look for what was not said. This had proven of particular importance in earlier speciality coffee research (Azavedo & Gogatz, 2021), but ultimately less so here.

It was noted earlier that even at this time, with digital direct sell from farmer to end user of coffee so possible over the internet, very few farmers pursue that approach. In practice shortening the speciality coffee supply chain refers to direct relationships between farmers and coffee roasters, farmers and coffee roasters with coffee shops and between farmers and coffee shops. End users were not interviewed in this study for brevity but effects of close or less close relationships between farmers and the categories mentioned were explored in their interviews in terms of meaning for the end user in the coffee shop or at home.

Research questions concerned whether supply chain shortening is happening? If that is the case, the question then has to be asked as to what are the benefits and dis-benefits of the shortened supply chain? Key interview questions revolved around what are the advantages or disadvantages for every party in the supply chain through its shortening, closer relationships through a lesser number of points. Considered of particular importance were aspects of relationships that went beyond purely transactional. That was often established through a question around what help is provided in either direction in the shortened supply chain, for instance from or to the farmer? From there the conversation would usually move to process

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improvement on the farms and to what purpose. In simplest terms purpose came down to improvement of quality, improvement of quantity or improvement of both quantity and quality.

Farmers' incomes always loomed large in conversation. Interviews usually closed with discussion of the gains and losses for the final consumer in shortening the supply chain of speciality coffee. The exception here was a final view, after all discussion, on the sustainability of the industry and its direction of travel with shortened supply chains. In some cases there was interest in discussing environmental sustainability and in some cases a greater focus on the individual business.

Quirkos Computer Assisted Qualitative Data analysis software was used to hold data in a well-organised, easily retrievable way. This represented a clear audit trail of the researcher's work. Quirkos was not used to analyse data or develop categories and themes, both done manually.

Analysis

Having stated that the tone of these interviews was conversational and at most semi-structured, it must now be clearly stated that this analysis is presented in terms of answers to a number of questions even where those, in fact, arose out of answers or, more likely, simply the looseness of conversation. This presentational approach offers high levels of clarity for the reader (Azavedo & Gogatz, 2021).

Some basic demographics may help the reader to picture this study's participants, a group sadly depleted by the exigencies of COVID in terms of lockdown, etc, but also in terms of internet access in the mountainous areas involved.

Table 2. Gender and Age of Participants

	Thailand	Vietnam
Gender	8 Male	1 Male, 1 Female
Age	Age Range 30-46 Median Value 35 Modal Value 35	Age Range 36-50 Median Value 43 Modal Value N/A

Do you buy direct from a coffee farmer?

All interviews began by affirming that there is a direct relationship between farmer and coffee roaster, coffee roaster and his/her shop, or coffee shop alone. This was true in all cases, in fact normalising the shortening of the supply chain to no intermediaries.

Do you simply have transactions or do you offer the farmer other support or input or he you?

Having ascertained a relationship with earliest questioning next came consideration of the nature of the relationship. As said earlier that focused on the flow of support, non-transactional elements to the relationship, though never dismissing that a relationship could simply be transactional. In fact it transpired that only one relationship was purely transactional, so effectively an outlier. The reasoning of the participant, a roaster, was simply that he has nothing to offer the farmer, no knowledge of coffee process. He just cups and goes by taste, looking first for sweetness and second for balance to produce the kind of flavour profile he favours. Simply, liking or not liking flavour at cupping results in purchasing or not purchasing. Where purchasing he pays premium prices so farmers themselves are encouraged to work

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though successful solutions. Generally, and perhaps surprisingly, there was little variation in the nature of relationships, as revealed below.

Do you help farmers with process improvement, if so which areas of process and to what end, meaning quality or quantity improvement?

The coffee process involves three elements, planting, picking and post-picking process stages. Six participants mentioned helping farmers around planting, but many meant supporting farmers in ongoing plant husbandry. For instance, only two participants talked of involving themselves in varietal choice with the farmers. That said husbandry at planting was genuinely considered important by some participants. This refers to such matters as planting distances and planting under shade. Ongoing husbandry may, for instance, refer to fertiliser use.

Picking is very much commonsensical, picking fine berries with no blemishes, picking ripe berries and introducing consecutive picking if necessary. One roaster attends with her own staff through picking (and post-picking) to help with staff levels but also as a quality control and training for the farmers and their staff.

Post-picking process is where the majority of participants were most involved with farmers. Post-picking process is central in coffee production. It may be tackled in many different ways, but just a list of those processes does not hint at the judgement, skill and experience involved around the process stages, even having decided which process. Doi Chang in only looking at Washed Process throw up the variables in this way “For the washed process, it takes an average of 3-4 days processing, starting with the cherries soaked in water, It is approximately 12-24 hours before going into the cherry depulping process. After the cherry depulped, the coffee parchment are open-air fermented for 12-24 hours, then continued by wet fermentation in water for 12-24 hours, then soaked in water until the mucilage is dissolved and peeling off, therefore washing parchment then continue to drying process” (”Craft selected lots”) Drying may proceed in many different ways. Drying can be an issue in Northern Thailand’s humid climate. Both the range of potential opinions, and the range of potential flavour options is easy to see.

Post-picking process is a major area for focus as it is so much a key to quality. Process improvement is seen very much in terms of either improvements in quantity or improvements in quality. In large measure it is a case of choosing one route or the other. In this survey six participants followed the quality route, and three participants argued that both quality and quantity are equally? Important, while none argued singularly for a quantity focus.

The balance of view there is overwhelming. Elsewhere the researcher has written about the quality turn and its rise. The concern for quality discovered here aligns with that, but it is necessary to unpick the specific driver of that in the Thai and Vietnamese speciality coffee supply chain. That driver appears to be farm incomes in both countries. That said, though, one participant went further: ““We are focusing on quality first. In my point of view quality is not the quality of the green bean itself. No. It is the quality of life of people who related to the coffee supply chain”. Another participant spoke of the content of many first discussions he has had with farmers which went along the lines of “…if we have the sustainable income, then we want to send our kids to go to school to get better education." At its simplest though the aim is to increase farm income as a result of improved quality. One participant pays farmers twice the market price, another guarantees 20%+against the local market price, and advances can be offered too, premium prices attained through quality improvement.

Where participants spoke of quality and quantity improvements running hand in hand for very simple reasons, not least that farmers need quantities of their improved bean to sell.

Equally if you have huge quantities to sell that would have been at a cost to quality, so no premium pricing available.

If the farmer gains through direct selling in the supply chain through increased income achieved with support to improve quality, what is the gain for the roaster or coffee shop?

The quality turn was discussed earlier. It can be seen in the coffee market and is at its pinnacle in terms of single origin speciality Arabica coffee, be that from Thailand, Vietnam or any other coffee-producing nation. To the extent that high quality also assures low supply quantities these are premium price products, attractive to sell or sell-on.

In simple terms speciality coffee bean attracts premium prices and high demand. It is also the enabler of a particular profile, that of a specialist, in the marketplace. To occupy a position in a clear niche market requires careful marketing. Part of that is the literally the bean stock that the roaster or coffee shop holds. In fact one roaster that the researcher spoke with finds it difficult to sell Thai bean or drinks made from Thai bean but holds Thai bean to be entitled to the "specialist" accolade. Worthy of note is that Thai bean is the cheapest that he sells. That said, as another participant put it "premium coffee can never be cheap".

It has been noted (Azavedo & Gogatz, 2021) that speciality coffee entrepreneurs may be regarded as essentially hobbyists. That may mean an emotional attachment to holding a high number of beans, holding particular types or nationalities of bean, etc that is an aside from any purely rational business logic.

What are the gains or dis-benefits to the final customer, drinking coffee in the coffee shop or at home, after home-brewing Thai or Vietnamese speciality coffee bean where there has been a close relationship between farmers and subsequent stages in a short supply chain?

One participant summarised "The customers receive good coffee with freshness at reasonable price and when they know how the coffee produce through the way we work with farmers, it is likely a bonus". Another participant commented " …..the customer gets to experience good coffee, I think that is the high gain. For people to be able to have access to high quality coffee".

Now, the most the researcher was hearing around price to the end customer was comments such as "reasonable" or "good value", yet theoretically if stages in the supply chain are removed price to the end-using consumer should reduce. One participant spoke very unequivocally to this: It is worth quoting his response fully: " No, no. No, it's even more expensive. Because if you buy from middlemen, they make one trip, they take 100 tons of coffee. Yes, and then they can divide it into their cost of goods sold, so this makes it cheaper for them to go up there. They buy volume and then they don't really spend time there. They just get their volume."

It seems from stated views of a number of participants that price reduction as the supply chain shortens simply is not going to happen, but what it may do is produce positive value perceptions of price versus quality, as discussed above, particularly as quality improvement has been such a major aim in coffee process development. There are, though provisos:

1. The customer may not be considering purchase as purely transactional, but factoring in other elements present in the third-wave speciality coffee industry, such as attractive décor, pleasant and knowledgeable staff, even pleasant music.

2. To develop a notion of value, including it's basis in quality, the customer must have an understanding of what constitutes quality. One participant put forward the idea of how little

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the average customer knows about coffee and its attributes. They need education on attributes which she sees as a large part of her job. With education customers can come to appreciate pricing and value against quality and think less in terms simply of an amount of money.

Another participant offered that his coffee is not cheap but good value, “so the point that staff have to help customers understand.”

Are there any sustainability benefits or dis-benefits through shortening the supply chain for Thai and Vietnamese speciality coffee?

Participants were often very concerned to discuss sustainability. Four participants spoke particularly lengthily on this issue. However it transpired that there were two views on the meaning of sustainability, sustainability of the coffee business, meaning the individual speciality coffee business or in aggregate as an industry or environmental sustainability. That two different views could be discerned did not imply disagreement, but, simply different perspectives.

One view was located in business aspects singularly and, ultimately, focused in customer retention. “You need to keep to keep the quality in each part of the supply chain, if you can do that and customer is willing to keep buying from you that will make the sustainability in the business supply chain” one participant offered as a summary.

The other view looked to environmental sustainability, albeit that that is also likely to imply sustainability for the farming business and thereby likely sustainability within the supply chain. A participant in Thailand exampled environmental and business stability being addressed by suggesting farmers abandon monoculture and embrace multi-cropping. This produces multiple income streams throughout the year rather than just one at a single point in the year associated with harvest. “"Okay, then. We look at the whole process of the integrated, or multi-cropping. I said, look, coffee, you have as in a wintertime, and then tea, you can have as the whole year-round. The stone fruits, you can have as in a summertime, and you can also harvest the vegetable for the food because you don't need to spend the money that you earn from the coffee." Clearly farm income is improved, so sustainability of the business, but multi-cropping also substantially increases bio-diversity so additionally aids environmental sustainability.

A participant in Vietnam suggested a similarly comprehensive and environmentally-concerned plan when working with farmers. The starting point is simple encouragement to plant under the forest canopy, so no deforestation and a shaded environment for the coffee trees. A step by step introduction of native species is suggested. “[We] Ask them to plant peanuts or soy-bean to newly planted coffee garden, buy these products. Improve cattle raising condition, collecting cattle waste, teaching how to make compost. Develop and test natural pesticides. Discuss with them opportunities to generate incomes from other sources, such as, bee keeping or [animal] husbandry.” Again farm income and the sustainability of the farm business increases alongside environmental sustainability.

Discussion

Many interviews were undertaken for this study, some very lengthy as happens when dedicated, in the phenomenological tradition, to giving participants time to say exactly what they wish to say. Perhaps for that reason, though, it is suggested that in some areas participants testimony be treated with caution. Participants offered opinions, no more and certainly in the nature of qualitative interviewing the facts and figures of precisely applied metrics were not offered. What was said arrived as the filtered summation of many sources, that is filtered from many sources that include, say, hearsay, but more particularly include an embedded cultural backdrop.

In Thai speciality coffee many are motivated by the notions of the Sufficiency Economy set out by His Majesty King Bhumibol Adulyadej who reigned in Thailand 1950-2016. In interviews conversation was infused with comments and words significant of embrace of the key notions of the philosophy, particularly of reasonableness and moderation. People sought enough income to sustain their businesses, enough income to sustain their families and sought that the environment be sustained. People would often talk of sustaining “the mountain”. The researcher was not talking with high-power cut-throat entrepreneurs, quite the opposite (Azavedo & Gogatz, 2021).

His Majesty King Bhumibol Adulyadej offered a specific set of suggestions for farming, often very detailed, and specific help in some sectors of farming, notably Arabica coffee farming. It relates with difficult terrain and abandoning opium poppy as the cash-crop of choice, as mentioned above.

In some ways the ideas put forward were simply continuous with what is now called Conservation Agriculture, but there will always be inflections both in suggestion and subsequent action according to local circumstance, if less in philosophy. That may be the obvious factor of the terrain but include many other possibilities to include human and financial capital. Human capital may be quite rapidly changing in Thailand and Vietnam. A number of participants talked of change as young graduates had begun to come back to family farms, some having received specific training in agriculture and agroforestry.

That aside even a low level of education, that is elementary school as against none, has been found important in participants stated willingness to adopt multi-cropping systems, to a backdrop of mono-cropping being normal in Northern Thailand ([Phetcharat, Chalermphol, Siphumin, & Khempet, 2018) Other interesting material from Phetcharat *et al* (2018) includes, for instance, that lower debt was an indicator in farmers being more interested in moving to multi-cropping. Again, where farmers had a high level of concern about the environment around their community they were more concerned to move to multi-cropping. This could, simply, be an alternative to expanding production through deforestation, clearing forest land. Writing around 2018 Phetcharat *et al* noted that in the past decade deforestation had continued at high levels in that highland communities of Northern Thailand, additional cultivable land seen as the solution to low farm incomes achieved through monocropping.

It must be stressed here that participant farmers in the Phetcharat *et al* (2018) study were not singularly coffee farmers, though some were included. If though in a diligent search for data the net is cast wider to Conservation Agriculture the picture may become even more confused. There are many examples of focus mis-match between different schemas, and, perhaps more particularly, through where applied. Gliessman (1985) assiduously and comparatively considers crop yields as a type of multi-cropping, relay cropping, is introduced at sites in Mexico and USA. In USA little or no yield gain was reported, in Mexico definite yield advantages. However, looking back to the Northern Thai Arabica coffee bean farmers, they are not even looking for volume gain, their route to high income being low yield/high quality, hopefully with high speciality cupping values, so high selling price. Tillage is a major issue in Conservation Agriculture, in fact arguably the defining issue or certainly a defining issue (eg Hobbs, Sayre, & Gupta, 2007) but is not of consequence to the Northern Thai Arabica coffee growers.

It seemed obvious to the researcher that differences in terrain or surrounding environments could amount to negative or positive movement in whatever metric from yield to farm income, including that a clear rise in yield need not produce a similar rise in income, since increased yield may bear extra costs. Whitmore, Cadisch, Toomsan, Limpinuntana, Van Noordwijk and Purnomosidhi (2000) analyse the economic value of novel cropping systems in

N.E.Thailand and S.Sumatra. They outline precisely this situation in North Eastern Thailand where substantial increase in rice yield is available through multi-cropping but additional labour costs mean that the cost increases exceed the income increases.

Within commentary on Conservation Agriculture there are differences of opinion on the impact of these processes, from positive to negative, but it is very easy to not be comparing like with like in the field research.

Research is clearly needed on the specifics of families, perhaps a group of families within the same co-operative, interviewing conducted in local dialect to produce data of any value, and probably then not data of comparative value with other areas, only between those families for instance around such metrics as debt levels. It could be that the reality for different families of the move to multi-cropping or any other aspects of either King Bhumibol Adulyadej's or Conservation Agriculture approaches would not only be different but result in different impact, positive or negative of the move to the new, essentially multi-cropping, approaches.

Nkala, Mango, Corbeels, Veldwisch and Huising (2011) offer "We conclude that the effectiveness of conservation agriculture toward better outcomes remains debatable". Elsewhere, considering Mozambique as a specific Nkala, Mango, and Zikhali (2011) suggested that conservation agriculture can improve livelihoods of farmers in Mozambique, "but it is necessary to be conscious about the different ecologies and categories of farmers in different areas", a timbred approach to conclusion. By contrast some of the positive commentary seems positively naïve as this "However, by reducing labour requirements and drudgery of farming and by increasing the farm income, CA improves significantly the livelihoods of farmers and their families" (Freidrich & Keinzle 2009). The researcher sees that the balance of change, positive or, of course, static is likely to be marginal in any direction. It could be that slightly better roads or somewhat better internet access or internet access at all may be critical, especially in relatively inhospitable terrain as the mountains of Northern Thailand.

To conclude in this way, however, is not in any way either to deny the testimony of participants in this study particularly in the many ways that it can be objectively proven – the fact of supply chain elements working together, the fact of high cupping values now being associated with Northern Thai bean, high prices at auction and high cost to the end consumer. In large measure those comments also apply to Vietnam, cupping values being, perhaps, the exception

Conclusions

The conclusion in this study, derived from the many discussions involved in this research, both written up here and otherwise, is that speciality coffee production in Thailand and Vietnam is in a period of expansion and that the distribution mechanism is changing away from one of merchant intermediaries toward one of direct relationship between both of in-country coffee roasters and coffee shops working directly with farmers. In fact the researcher only knows of one major supplier of roasted Thai bean to retail suppliers or direct to the public who buys his Thai bean from middle-man sources.

Collaboration between farmers and the roasters or coffee shops is normally very close. By that is meant mostly working together to improve coffee production processes post-picking the cherries, covering such areas as drying and fermentation. The drive is essentially toward quality improvement with that aim driven particularly by improvement of farm incomes. Speciality coffee is of high value, commodity coffee is not. It of course follows that those downstream in the supply chain, the roasters and coffee shops, also have the income benefits of a high-value, sought-after, product. However, the end consumer does not imbibe a cheap

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product, so as the end consumer puts a coffee cup to mouth his or her purpose is precisely to drink a quality product unconcerned about price. As an example in an upscale coffee shop just off Bangkok's Sukhumvit a not particularly special Thai Pang Khon coffee sells for Baht 195 / $6.25 a cup. Equally, though to show how much speciality coffee drinkers will pay there is an Ethiopian Geisha on the menu at Baht 550/ $17.64 a cup.

It must be particularly noted that the high prices for Thai and Vietnamese speciality coffee bean, however much they may represent good value for money, disprove the classic supply chain economic theory that if the number of intermediaries in a chain is reduced price will go down to the end user. With Thai and Vietnamese speciality coffee that is simply untrue, indeed the whole approach within the speciality coffee industry to increasing farmers' incomes is based from the reduced price to end-user theory being wrong.

Every piece of research has limitations, including temporal and locational. For this research it may be that its conclusions have no applicability at other locations or at other times. That is a usual conclusion implying the need for future testing at other locations and at various points in time. For instance, the locations considered here were South-East Asian (that definition for Vietnam could be quibbled) so why not consider the position in South or Central America? More to the point further testing in Arabica coffee-producing locations globally should be extensive as possible.

Yet it is usual for resources to be limited. This project was self-funded, with funds representing a very real constraint on travel, accommodation, translation support and transcription. Travel was intended both within Vietnam and within Thailand and between the two. The constraints were in-built and known.

However, the real-time constraints, matters arising, were very powerful constraints. The core reference there is to the advent of COVID-19. No future researcher can plan for such a situation with accuracy, though knowing the constraints and being entirely honest about those and the value of so-called workarounds may be helpful in working with any acute situation that might arise.

Because of COVID constraints travel to Vietnam became impossible. Mostly air travel within Thailand was also impossible and sometimes bus travel too. This resulted in a number of consequences:

1. Adoption of digital technologies for communication in place of face to face communication. The reference here is such applications as Skype. This was largely a failure through the mountain environments involved, but also because so many farmers or farming villages lack laptops or smart phones.

2. Communication was so poor that the decision had to be taken to revert to face to face meeting, but that meant a bias toward Bangkok participants and with that came an alteration of the projected balance of participants. Farmers became relatively under-represented, coffee roasters and coffee shop owners relatively over-represented.

3. The intention was to look closely at farmers' incomes. The reality of increased farm incomes needs quantification as best possible, though notoriously the mountain farmers do not keep records. The intention was to try to tease figures out of them and to be satisfied with anecdotal recall where hard figures were simply unavailable. Either way the intention was to gather a significant number of examples, so a solid body of evidencing around this critical variable.

The researcher feels that for the future further investigation of farmer incomes is critical and that best tackled in Thailand with Lao dialect Thai language support.

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