

## AN ANALYSIS OF COFFEE GROWER HOUSEHOLDS IN RESPONSE TO THE GLOBAL COFFEE CRISIS IN LAM DONG PROVINCE, VIETNAM

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### Abstract

Since the late 20<sup>th</sup> century, globalisation has become an irresistible trend, bringing opportunities and challenges for Vietnam's economic development. After the 1986 reforms, Vietnamese coffee production increased more than 200-fold, and the country became the second-largest coffee producer in the world. Vietnamese coffee is a unique story in the history of the global coffee industry. This study examines coffee development in the Lam Dong province of Vietnam. Lam Dong province is a vital area for coffee production in Vietnam. It describes how smallholder farmers are responding to the effects of the global coffee crisis, including issues such as fluctuations in coffee prices and climate change. This study draws on data from in-depth interviews with 53 smallholder farmers in Lam Dong province to understand how farming systems, corresponding land use and labour use have changed due to the impacts of the crisis. The study shows that most smallholders have changed their land use and cropping mix. Some smallholder farmers are trying to reduce their vulnerability to environmental damage and coffee price volatility by practising sustainable coffee farming. This shows the vitality and flexibility of smallholder farmers in Lam Dong Province in connecting to the developing trends of the world coffee market.

**Keywords:** *global coffee crisis, climate change, smallholder farmers, sustainable coffee, Lam Dong province, Vietnam*

### Introduction

Coffee is one of the most popular drinks in the world, and the coffee industry contributes to the economies of both exporting and importing

countries (ICO, 2019). Over one billion people worldwide drink coffee daily, adding up to an average of 2.25 billion cups of coffee consumed worldwide daily. Coffee lovers come from every corner of the globe. Over 90 percent of coffee production occurs in developing countries, while, in contrast, consumption takes place primarily in industrialised economies. There are 75 countries where coffee is grown, while 51 countries export coffee, mainly in South America, Africa and Asia. These countries employ about ten million labourers and produce approximately six million tons of coffee annually in over ten million hectares (ICARD & Oxfam, 2002). Worldwide, some 25 million growers, as a result, rely on coffee for their livelihoods, with most of these growers being smallholder farmers (ICO, 2019).

Vietnam is a world-famous coffee-producing country, but its history of coffee planting is relatively brief. In the early 19<sup>th</sup> century, French missionaries first brought coffee plants to Indochina, which were then introduced to Vietnam specifically by the French colonial powers. At first, coffee was planted in the northern provinces, namely Ninh Binh, Thanh Hoa, Nghe An and Ha Tinh, on the premises of Catholic churches. Subsequently, the government began large-scale coffee plantations in the Central Highlands region between 1920 and 1925, and coffee cultivation gradually became entrenched in the Vietnamese culture. By 1930, Vietnam had about 7,000 hectares of coffee (Chi, 2007).

After the division of North and South Vietnam (1954), the northern government took over French plantations and formed 24 state cooperatives (D'haeze et al., 2005). In Southern Vietnam, in the meantime, nearly 10,000 hectares of coffee trees had been planted by 1975 (Nghiem et al., 2020).

After the country's reunification in the mid-1970s, Vietnam focused its resources on developing coffee production. Another key event in the history of coffee production took place in 1986. This event, known as Doi Moi, occurred when Vietnam established a new system that gave farmers the right to keep and sell parts of their farm production. Eventually, farmers were no longer restricted by production quotas and could benefit from a more unrestricted and liberalised market. In addition, incentive structures improved after the land reforms, which granted land use rights to farmers, giving them security of tenure and the ability to borrow for agricultural production using their land as collateral (African Development Bank Group, 2017).

As a result of these changes, coffee boomed – in the Central Highlands region in general, and Lam Dong province specifically – during the 1990s and the early 2000s, and smallholder farmers widely accepted the crop. Since then, coffee cultivation has provided small farmers with a substantial income and has transformed their livelihood from subsistence farming towards a market-oriented economy. More than one million Vietnamese coffee farmers make a living from

such farming. Although coffee is one of the commodities prioritised by provincial governments, 85–90 percent of the land under cultivation is farmed by smallholders who own one-to-two hectares each (African Development Bank Group, 2017).

After more than 30 years of development, the boom years ended. Vietnamese coffee is now faced with a global coffee crisis caused by falling prices, climate change, ageing coffee trees and competition from other countries. Since 2016, coffee prices have dropped 30 percent below the ten-year average. As a result, agricultural incomes have declined, and coffee growers have struggled to adapt to the price fall (Eakin et al., 2006). The fall in coffee prices has had serious economic and social consequences for producing countries (ICO, 2019). In addition to the coffee price drop, smallholder farmers are struggling with climate change and consequent weather anomalies. The Coffee and Climate Organization has also pointed out that changes in rainfall patterns, temperatures, storms, strong winds, and other extreme weather events have directly impacted the quality of coffee and its productivity. These effects can be direct (on the coffee tree) or indirect.

To increase the competitiveness of Vietnamese coffee, the Vietnamese Government has recently launched several initiatives to improve its quality. In 2014, for example, the Vietnamese government released a plan called “The Vietnam Sustainable Coffee Plan up to 2020 and Vision to 2030.” It contains concrete economic benchmarks for the industry’s performance by 2020 and 2030 with regard to export turnover (ICO, 2019).

Previous studies on the Central Highlands region of Vietnam have focused on economic and environmental issues, the transformation of agriculture in the Central Highlands region, and social change. Some have focused on analysing the Vietnamese Government’s coffee policy. The aim of this study, however, is to examine the process of expanding coffee production in Lam Dong province and how Lam Dong coffee farmers decided to switch to sustainable coffee farming, including the changes in farming systems that have taken place in response to the current coffee crisis. This study looks at the corresponding land use changes and other factors, such as the role of labour, the effect on farmers’ decision-making, and other responses by smallholders to the current coffee crisis. Also studied is how farmers minimise their vulnerability to environmental damage, what they understand by sustainable coffee production and how they practice sustainable coffee farming to secure their livelihoods.

### **Study site and field survey**

The fieldwork for this study was conducted in Lam Dong province, one of the five provinces in the Central Highlands region of Vietnam. It borders Dak Lak and Dak

Nong provinces to the north, Khanh Hoa, Ninh Thuan and Binh Thuan provinces to the southeast, and Binh Phuoc and Dong Nai provinces to the west. Lam Dong province has a population of 1.2 million people (2010) and is home to the majority Kinh (Viet) and ethnic minorities such as the K'Ho, Churu and M'Nong. A large network of major transportation routes connects Lam Dong province with the Southeast and South-Central Coast regions, Ho Chi Minh City, and other Central Highlands regions (Mulia et al., 2019). Lam Dong province has a tropical climate with monsoons. The average annual temperature is 16°C–23°C. The dry season lasts from December to March, while the rainy season lasts from April to November. Lam Dong is considered one of the most important provinces economically in the Central Highlands region, with high economic growth and large potential markets.

Agriculture is one of the most important economic sectors in the province. According to the province's 2017 book of statistics, and as reported in the provincial plans up to 2035 and its further vision until 2050, the province's GRDP (gross regional domestic product) at current prices reached about VND 63.4 trillion (equivalent to about US\$ 2.76 billion) in 2016. However, the large dependence on agriculture makes Lam Dong province vulnerable to uncertainty in the global agricultural market and climate change (Mulia et al., 2019).

Lam Dong province was selected for this study because of its relatively long history of coffee production in Vietnamese terms. Coffee was first cultivated in Lam Dong province about 100 years ago, with the area having very favourable natural conditions for growing coffee trees. The province currently has 172,000 hectares of coffee trees, with an output of 515,000 tons annually. The area used for Arabica coffee is about 17,500 hectares, accounting for 10.2 percent of the area's total.

Lam Dong coffee has the highest average yield and output in the country. Although coffee cultivation in Lam Dong province is spread throughout the province. The Robusta coffee variety is grown in the southern part of Lam Dong province, mainly in Di Linh, Lam Ha, Bao Lam, Đúc Trong and Bao Loc, accounting for 94% of the entire province's Robusta output. This is followed by the Arabica variety, mainly planted in six areas of Lam Dong province, mainly in Cau Dat and Lac Duong.

Coffee grown in Lam Dong is exported to the EU, Philippines, Japan, the United States, Singapore, India and China. In turn, coffee is the export commodity that brings the largest source of foreign exchange to Lam Dong province. Lam Dong province currently has 65 units, 2 branches, and 564 farmers participating in coffee purchase, operation, production, and processing.

In 2020, the Lam Dong provincial authorities produced a plan for the

region's coffee management and development for 2021–2025, with an in-depth production scale focused on improving productivity and quality. Encourage smallholders to develop sustainable coffee-growing areas. The plan included stabilising the coffee-producing area by 2025 at about 170,000 hectares, of which about 18–20% of the coffee area will be Arabica; increasing the average productivity of green coffee in the whole province by 2025 to about 3.6 tons per hectare of output, reaching about 530,000–550,000 tons in total per year; also, improving the green coffee processing capacity in the area by 2025 to reach 510,000–520,000 tons (accounting for 92–95% of the province's coffee output). Furthermore, Lam Dong authorities at all levels, as well as professional agencies from the province to the grassroots, are helping smallholder farmers improve coffee quality, expand the scale of sustainable coffee production, and produce speciality and organic coffee.

The period covered in this study is between February 2017 and February 2020, when primary data was collected during fieldwork trips and from in-depth interviews with 53 smallholder farmers – 38 males and 15 females – who have lived in Lam Dong for at least 20 years. These included areas such as Lac Duong (LD), with 18 informants (most of them are ethnic K'ho), and Cau Dat-Da Lat (CD), with 35 informants (ethnic Kinh). These participants were selected because they had more than ten years of experience planting coffee, long enough to have experienced how coffee boom and busts in the local area affect their livelihoods. The average age of the participants is 56 years old. The youngest is in their late thirties, and the oldest is over 70. All the smallholder farmers who participated in this fieldwork grow Arabica coffee, which is most suitable in these regions. Adult members in each household are responsible for the coffee farms, except during harvest season when they have to hire additional labourers to pick the cherries.

Each interview took more than an hour. All of the interviewees' identities are kept confidential through pseudonyms. A semi-structured questionnaire guide was used, and the interviews were recorded in Vietnamese and later transcribed and coded. Ambiguous responses were clarified using field notes and contacting participants directly. The questions looked at how households used their land and the amount of work that was needed. They were also asked for details on their particular methods of upland farming, their income sources away from farming, any difficulties and challenges, and any particular ways they have to enhance their living standards.

The researcher stayed in the community during the research time to observe and participate in the life and work of coffee farmers. The researcher also participated in local coffee events, such as coffee picking, coffee bean picking, and company/cooperative training courses, among others, and had the opportunity to

observe and interact with the interviewees to understand their interests and views. This helped the researcher gain these community members' trust, resulting in candid and authentic information being gathered.

In addition to the above interviews, two focus groups were formed, consisting of experienced and knowledgeable coffee producers in Lac Duong and Cau Dat-Da Lat. The meeting was held at the house of a coffee grower whom the researcher knew well. Each group consisted of six to eight people. The participants were asked to identify problems associated with the recent coffee crisis and how they responded to declining market prices and climate change. They also discussed how diversification and land use change have been prompted by economic pressures and how they minimise environmental vulnerability and practice sustainable coffee farming.

Between 2021 and 2022, due to the lockdown impact of COVID-19, the researcher could not visit the site and instead interacted online with the informants using Zalo, Line and Facebook Messenger. The aim was to obtain up-to-date information on the progress and difficulties in switching to sustainable coffee production.

### **The global “coffee crisis” in Vietnam: Good harvest; bad price**

The “coffee crisis” affects the livelihood of millions of farming households in developing countries. Coffee is one of the most widely consumed beverages in the world and one of the most traded commodities globally. Coffee is an important commodity in coffee-producing countries, particularly as a source of foreign exchange for the national economy. However, coffee, like many other commodities, is vulnerable to steep spikes and depressions in its market price. The international market price of coffee is affected by many factors, such as climate, politics, changes in supply, and consumer and investor influences. In order to ameliorate these fluctuations, the first international coffee agreement (ICA) was finally signed in 1962 between most producing and consuming countries and successfully raised and stabilised coffee prices (Palm & Vogelvang, 1991; Gilbert, 1996). However, the ICA officially ended on 4 July 1989, resulting in a chaotic free-for-all in the global coffee trade (Rice, 2003). Between 1980/81 and 1988/89, coffee producers still controlled almost 20 percent of their total income, while 55 percent went to the consuming countries. However, between 1989/90 and 1994/95, the proportion of total income controlled by producers fell to 13 percent while consuming countries retained 78 percent (Ponte, 2002). This occurred while coffee production increased from about 8.5 million tonnes in 2008 to 10.7 million tonnes in 2020, with 11 million hectares cultivated (FAO, 2022).

Vietnam was not spared from these developments. 1999 global coffee prices fell, leaving many Vietnamese farmers in debt. Furthermore, the average composite coffee price fell by 25 percent in 2000 and 29 percent in 2001 (FAO, 2003), pushing more Vietnamese coffee growers to their financial limits. As a result, the collapse in coffee prices had significant effects throughout the country and reversed the fortunes of many smallholders (Lindskog et al., 2005); some went bankrupt, others began to switch their crops to corn and pineapples to make a living, and some who could not recover their costs of production abandoned their farms. However, most farmers still try to find ways to hang on to coffee trees by growing fruit trees, raising livestock, working as wage labour and hoping that coffee prices will increase in the following years. Besides facing the coffee crisis, to survive, K'ho coffee growers in Lam Dong province have returned to traditional coffee growing methods by reducing the use of chemical fertilisers, increasing the use of biological fertilisers, or killing insects and worms by hand (Truong, 2020).

### **Coffee and climate change**

Climate change and related weather anomalies affect coffee quality and farmers' livelihoods. Climate change patterns include prolonged dry spells, water shortages, hailstorms and extreme rainfall, which strongly impact coffee production. Some researchers highlight the warming temperatures and declining rainfall threatening global coffee production (Bunn et al., 2015; Läderach et al., 2017). The International Coffee Organization (ICO) also predicts that under various climate change scenarios, coffee production will decrease by up to ten percent (Thurston et al., 2013). Climate change is likely to significantly increase the burden on the health and well-being – physical and mental – of coffee producers, labourers and their communities, with subsequent consequences for productivity (Climate Institute, 2016). The same report also points out that Robusta is a less heat-sensitive plant, but Arabica performs best at 18–21°C. Above 23°C, the plant grows too fast, and the fruits appear too early, damaging the bean's quality. Even half a degree at the wrong time can make a big difference in coffee's yield, flavour and aroma (Climate Institute, 2016), making life harder for coffee farmers. It is difficult to move plantations or change crops because of their resources, low technical knowledge and lack of governmental support (Gay et al., 2006).

The Global Climate Risk Index ranked Vietnam as one of the top ten most vulnerable countries to the impact of climate change (Sönke et al., 2016). According to a drought assessment by the Ministry of Agriculture and Rural Development, Vietnam, in 1997–1998, about three million people were affected, and the total losses in terms of agricultural production were estimated to be about 400 million US dollars (Vu et al., 2015). Furthermore, in recent years, droughts have worsened

while rainfall has decreased. For example, in 2015, Vietnam's rainfall was down to only 60 percent of its average. In 2016, a severe drought affected 100,000 hectares of coffee plantations in the Central Highlands region. Prolonged drought lowered the yield by between 15 percent and 25 percent (Trung, 2017). Besides, as Mulia et al. (2019) indicated, the southern part of Da Lat City, Lam Ha and Duc Trong districts of Lam Dong province were areas with serious surface water shortages. As a result, most coffee farmers in Lam Dong utilise pumps to draw water from rivers and lakes. However, coffee production is severely constrained by the lack of irrigation water, especially during the dry season when groundwater levels drop significantly (Tien et al., 2019).

### **Sustainable coffee development**

In the second half of the 1980s and early 1990s, humanity faced significant challenges due to the depletion of resources and the deterioration of the environment. In this situation, a new development concept, that of sustainable development, came into being. Sustainable development was defined by the *Brundtland Report* (1987) as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Such development requires a balance between the environment, society and the economy, regarded as the three pillars of sustainability (Thomsen, 2013). First, economic sustainability provides a social and economic return on investment and a political commitment to related issues to achieve long-term economic growth that can simultaneously improve society's quality of life and the environment. Second, social sustainability, which aims at social equity, providing social justice for the poorest (poverty alleviation), and improving human and labour rights, as well as increasing prosperity and the quality of life of present and future generations, factors which run alongside cultural preservation, social participation and development, and social responsibility. Finally, environmental sustainability aims to stop society's excessive use of natural resources to ensure their availability for future generations (Thomsen, 2013).

Nowadays, consumers are not only interested in the quality and taste of coffee but also concerned with issues such as poverty, social injustice and environmental degradation. This is one of the main factors behind the growing market for "sustainability" in the food and beverage market (Pierrot, Giovannucci, & Kasterine, 2011). Sustainable coffee is a collective term that encompasses organic, fair and direct trade, environmentally friendly and shade-grown coffee cultivation methods (Giovannucci & Koekoek, 2003). However, "sustainable coffee" has been debated in academic and industry circles for several years. Despite the numerous and sometimes contradictory attempts to define it, the term "sustainable coffee" is



still inadequately formulated and often misunderstood (Rice & McLean, 1999). Since the coffee crisis in 2001–2003, sustainable coffee has become a mainstream topic at conferences, in research, and in policy discussions. It has been stated that “sustainable coffee offers new opportunities for producers” who face difficulties in prices and production conditions, as they cannot escape poverty. Reganold et al. (1990) show that low-input sustainable agriculture reduces reliance on fertilisers, pesticides and other purchased inputs. As a result, sustainable farms offer farmers a higher economic return of 22 percent to 35 percent compared to others (Ramesh et al., 2010; Crowdera & Reganold, 2015). However, Guthman (2004) has pointed out several obstacles to sustainable production. First, the initial transition period from a conventional farm to an organic or shade-grown farm can be labour-intensive, expensive, and take several years. Second, to obtain certifications such as organic or fair trade, farmers must pay fees to certification organisations. Many farmers operate with a lower profit margin or at a loss during transition periods.

## **Findings**

### **The coffee boom process since the 1990s**

Historically, coffee was not an important agricultural crop in the Lam Dong province. Coffee was first cultivated in the Central Highlands region between 1920 and 1925. After that, Arabica Moka coffee was grown in some areas of Lam Dong, but only on a small scale. Most households made a living from working on the coffee plantations of French colonial, growing vegetables and tea. According to the survey done for this research, from 1975 to 1985, 38 informants grew vegetables such as sweet potatoes, potatoes, and chayote, 10 informants made a living from growing flowers, and the rest worked on tea plantations. In 1986, the government introduced its new economic renewal policy, Doi Moi, allowing farmers to grow and keep part of their production. At this time, some of them started to switch to growing Moka coffee. They reported that because it takes three to four years for the coffee trees to be harvested, they continued to grow vegetables to make a living while they expanded the coffee acreage in their fields. It took an average of two to three years to expand coffee tree cultivation to their fields. In particular cases, many informants reported that it took them about seven to eight years to plant two to five hectares of land with coffee trees due to the limits on capital and labour.

However, as coffee prices increased in the 1990s, vegetable prices declined, resulting in lower revenue. As part of the Lam Dong administration’s permanent cultivation effort, households were exposed to industrial crops like coffee by providing coffee seeds, seedlings, supplies, and access to bank loans for coffee

growers and businesses, which helped them deal with their existential dilemma. Consequently, all informants stated that they moved to grow Moka coffee. However, by the late 1990s, most informants stated that they had switched from Moka to Catimor due to the former's unreliable production, low disease resistance and frequent insect infestation.

Vietnamese agencies introduced the Catimor variety to Vietnam from Portugal in 1986. In 1996, the Ministry of Agriculture and Rural Development officially recognised and approved the Catimor variety for widespread production in Vietnam. At that time, due to the limited availability of Catimor seedlings, the government only provided a small amount to the farmers' associations of each village, who delivered the seedlings to members. The seedlings' cost was covered by the farmers' associations and their members, as CD4 explained:

The government proposed measures, but the farmers' associations had little money. The members had to share the seedlings and transportation costs. So, the farmers' associations send their employees to the province to pick up the seedlings from the village and then distribute them to their members.

Between 1988 and 1999, coffee prices rose strongly, and coffee growers quickly cleared land or cut trees in mountainous or forested areas to grow coffee despite it being strictly prohibited. During the interviews, the researcher often heard interviewees mention their story of land reclamation, as CD22 and LD10 explained:

I bought 0.3 hectares in 1997, and now I own three hectares of coffee. As you know, my farmland is close to the forest, so we have been reclaiming the forest land little by little, more every day. My land has a lot of big rocks, it's very difficult to dig them up. (CD 22)

We bought one hectare in 1995. We reclaimed the land by gradually cutting down the trees in the forest and replanting them with coffee trees. My coffee areas are getting bigger and bigger. (LD 10)

However, all informants reported that a certificate of land use right did not exist because other farmers had previously reclaimed the farmland. When the sellers sold the farmland to the buyers, they just signed a piece of paper, which they counted as a sales contract without consulting any legal authority. Since buying the land, the buyers have continued to reclaim and expand it; nevertheless,

the National Forestry Department still manages all this land. Therefore, buyers generally do not have the certificate of land use right to show for their coffee plantation. CD22 explained: “Before, when I bought this land, we only signed a sales contract on paper because the seller claimed the land without any certificate of land use right. We cannot go to the government agency to make a transfer of land use rights, but I continue to reclaim the land. Currently, my coffee plantation is without the certificate of land use right.” Similarly, CD16 also stated, “Because the government’s management was loose in the past, everyone could reclaim the land as they wanted, but now the government strictly prohibits cutting trees in the forested areas to grow coffee. Currently, my coffee plantation is managed by the National Forestry Department, so it is difficult to apply for a certificate of land use right.” Moreover, LD9 reported, “Thirty years ago, although the government banned cutting trees in the forestland to grow coffee, I still walked or rode a bicycle to go into the forest to reclaim the land. At about 7 a.m., my family and my neighbours went to the forestland, and we brought meals, hoes and machetes to reclaim the forestland. Everyone helped each other to reclaim the land. It took me about three years to reclaim 1.1 hectares of land.”

The Catimor coffee tree boom started during the period 2000–2005. During this period, most growers switched to growing this coffee. All informants, in turn, reported that they switched to growing Catimor coffee during this period, and coffee became their main source of income. In this research, the informants included 41 households that owned land with an area of 0.5–3 hectares, nine with 3–6 hectares, and three with more than 6 hectares. Their farms are located in the mountains or hills. The average annual yield per hectare is 15–20 tonnes (fresh coffee cherries). Catimor coffee has become a “promised land” in Lac Duong and Cau Dau-Da Lat. Based on Lam Dong province’s statistics for 2018, Cau Dat-Da Lat had a total Arabica growing area of 5,160 hectares, while Lac Duong had 3,876 hectares where Arabica coffee was grown. As CD15 said: “At different times and according to market demand, people here will plant different crops. Before 1975, they would grow chayote. After 1975, they would grow sweet potatoes, potatoes and flowers. Now, most of them grow coffee.” This shows the flexibility and resilience of farmers in the face of changing market conditions.

During the golden era of coffee, most informants reported that they could make money by growing coffee, which included supporting their families, paying for their children to go to college, and even building a house and buying land to expand their coffee plantations, as CD4 and LD7 explained:

My family was growing coffee in 1976, but not much. After 1985, we started growing lots of coffee trees. At that time, coffee was an export

product and was very valuable. One kilogram of coffee equalled ten kilograms of rice. Ten kilograms of coffee can buy a bag of rice, and two bags of rice provide food for a month. So, everyone rushed to plant coffee. In the 1990s, coffee prices were very good, and quite a few people relied on coffee to buy land or build houses. At that time, whoever had coffee could get rich. My family also bought more hectares of land during this time. (CD4)

I remember that from 1994–1998, coffee prices grew strongly, and most farmers relied on coffee to earn money. They built houses and bought the land. (LD7)

### **The global coffee crisis**

Coffee is one of the most traded commodities in the world economy, accounting for approximately US\$ 16.5 billion in 2010 when some 97 million bags of 60 kg each were shipped. However, the steep spikes and depressions in the price of coffee can have a devastating effect on farmers. Between 2011 and 2013, global coffee production increased, resulting in coffee prices falling back to early 2009 levels. From 2018 to 2019, coffee production increased significantly, while coffee prices hit lows twice, with further declines that continue to this day. This has prompted many developing countries that rely on coffee exports to fall into an economic crisis, which has also caused problems in Latin America and Africa. Vietnamese farmers are no exception. Affected by the global coffee price crisis, some Lam Dong coffee farmers have become heavily indebted. During the interviews, all Lam Dong farmers told the researcher that between 2015 and 2019, coffee prices plummeted, and their incomes shrank strongly, affecting their livelihood, as they explained:

Prices have not been good in the past few years, especially in 2017, 2018, and 2019, when coffee prices fell much lower than before. You couldn't make money by growing coffee, so you had to tighten your belt. (LD11)

Recently, coffee prices have fallen sharply, most coffee farmers are in trouble, and some farmers have abandoned or sold their coffee plantations. Many families with better economic conditions switched to growing flowers or "organic vegetables." And due to the prices having dropped, we must make careful calculations when we buy fertiliser or hire workers; otherwise, we will lose money. (CD10)

Besides price fluctuations, climate change is a threat to coffee trees. From 2014 to 2015, Lam Dong coffee yields decreased due to damage caused by frost. More than 700 hectares were damaged, affecting more than 1000 households. Most informants reported a more than 30–40 percent loss during the 2014/2015 harvest. Furthermore, from 2018 to 2022, coffee farms in Lam Dong were also attacked by tea mosquitoes, affecting the quality of coffee cherries and leading to decreased yields, as they explained:

In the last three years, pests and diseases have been particularly bad, including tea mosquitoes that eat coffee flowers. Our coffee plantation had poor harvests last year and this year, with production falling by 25-30%. (LD 5)

Tea mosquitoes are used to attack cashews and tea trees. However, due to recent climate anomalies, they began attacking coffee trees. When I discovered this, the tea mosquitoes could fly from this coffee plantation to others despite using pesticides. The extent of the damage to the coffee plantations is also very high. The yield of my coffee plantation last year was about 40% lower than in previous years. The emergence of the tea mosquito epidemic has been a headache for us. (CD21)

During a group discussion, it was stated that previously, it was easy to grow coffee in the province, with fertilisers and pesticides rarely being used and yields being large. However, coffee trees have recently been affected by those tea mosquitoes, and as a result, the output of the trees has sharply fallen. Farmers have had to spend more time taking care of coffee trees while seeing their income decrease. Moreover, the researcher was informed that there was no way to kill mosquitoes completely, and if mosquitoes appeared in any area of the coffee farms, they must be treated immediately. Otherwise, the insect would spread throughout the coffee farm.

### **Smallholder responses to the coffee crisis**

At the time of the survey, informants were asked to report how they responded to the coffee crisis. The focus groups and household interviews revealed that they responded to the coffee crisis with different adaptation methods depending on the type of land involved, the availability of labour and the family's economic situation. These methods included growing other crops, diversifying agriculture or switching to sustainable coffee farming practices. Also, several research participants used their free time to work in other coffee plantations to earn more

money. No household reported selling their coffee farm.

During the group discussions, some informants said they hesitated to convert to sustainable coffee farming because of the initial expense, the labour costs of conversion, and the old coffee trees. They also feared that without pesticides, their plants would be overrun by pests in the region, resulting in lower coffee yields and less income. Informants also hoped that government authorities would increase and improve knowledge transfer processes so farmers could better understand the technology and benefits of sustainable coffee production. They hoped, furthermore, that the authorities would be able to help create favourable conditions for switching to sustainable coffee production to achieve high efficiency, improve coffee quality, reduce the damage and risks associated with transferring to new methods, and reduce environmental pollution.

In this study, only two informants cleared sections of their farms by cutting coffee trees to plant other crops. One informant who owned nearly three hectares of coffee then cleared two hectares to plant flowers and clean vegetables to be sold at the market. The other, who owns four hectares of coffee, cleared 0.5 hectares of land to plant flowers and green bell peppers. As he explained: "Nowadays, growing coffee is not as profitable as it used to be, and even loses money. Growing flowers and green bell peppers is more profitable than growing coffee."

Three informants in Cau Dat-Da Lat stated they worked in other coffee plantations during their free time to earn some money to support their families. Four informants in Lac Duong worked part-time as construction workers. Another informant in Cau Dat-Da Lat diversified his income by opening a barbershop. In the informants' words:

Besides growing coffee, I have to work outside as a construction worker when I have time to get more money to subsidise my family. (LD6)

I couldn't earn any money by growing coffee in these few years, so I opened a barbershop to supplement my family income. The barbershop has become the main business while growing coffee has become a side business. When coffee prices rise, coffee cultivation will become the main business, and the barbershop will become a side job. (CD21)

Two informants said they would make dried or persimmon wine to increase their income. CD4 stated: "Because the price of coffee has been falling over the years, to reduce the risk of growing coffee and to increase income, we planted some persimmon trees in our coffee plantations. But fresh persimmons cannot be kept for a long time. Besides, people here have begun to plant persimmon trees

one after another. This has led to the price falling, so we have invested in equipment to make persimmon wine and dried persimmons." CD20 also commented: "Over the past decade, coffee prices have been unstable, sometimes falling dramatically, so in 2017, I started learning how to make dried persimmons. 2018, I started producing dried persimmons and selling them at the market."

Most informants reported that, with the support and encouragement of the Vietnamese Government, they are planting other crops, such as persimmon trees and avocado trees, on their coffee farms and have switched to sustainable coffee growing. Among the sustainable methods used, they reduce the usage of chemical fertilisers and pesticides, increase their use of bio-fertilisers, and eliminate the use of herbicides; make organic fertiliser collected from cow and pig manure; and use natural wild grass to cover the ground to retain the soil moisture. They also planted persimmon trees and avocado trees to shade the coffee plants. This can stabilise the soil properties of the tree roots, and the roots of the trees provide microorganisms that keep the soil fertile and supply the coffee plants with nutrients. Informants agreed that they wanted to revert to traditional farming by reducing the use of fertiliser and pesticides. In recent years, it has emerged that sustainable coffee production has increased the productivity and quality of coffee produced on farms and has brought economic benefits to farmers in Lam Dong. As they explained:

Besides growing coffee, I grow other crops, such as persimmon and avocado. Over time, chemical fertiliser use across the farm makes coffee trees weaker and less stable. I am switching to growing sustainable coffee, step-by-step, to reduce chemical pesticides and increase bio-fertiliser use on my coffee farm. The price is better than before. (LD8)

Although many farmers in the village are still hesitant to switch to sustainable farming practices, my family has decided to do so. I believe that with government support and consumer demand, sustainable coffee will have a place in the world coffee market. (LD15)

We used to rely heavily on chemicals and fertilisers to grow coffee. I feel it's not good for my health or the consumers if we carry on like this. That's why I switched to sustainable coffee farming four years ago. The purchase price is relatively stable, and my income has increased. (CD 33)

## **Discussion**

In the 1990s, coffee prices rose while vegetable prices fell. This led to the livelihood of the smallholder farmers in Lam Dong changing from a subsistence economy to a market-oriented livelihood based on sustainable agriculture. Due to the coffee boom, land use in Lam Dong province shifted from growing tea and vegetables to growing coffee trees. The consequent agricultural expansion in this region in the 1990s led to the destruction of some forests, particularly due to the relatively high prices for coffee yields at the time. Migrants also began flooding into the region to help with coffee production. When they converted to coffee, smallholder farmers generated significant amounts of cash. Income from coffee became the main income of the whole family. At this time, they bought land to expand the growing coffee areas, built houses and provided money for their children to go to school. As we explained in the results section, the mechanism behind these livelihood transformations, and ultimately behind the land use changes, was the Lam Dong government's incentives and assistance as part of its permanent cultivation effort. Such efforts exposed households to industrial crops like coffee, which helped them deal with their existential dilemma at the time.

Responding to the global coffee crisis, the smallholder farmers of Lam Dong gradually switched to sustainable coffee cultivation. They realised that sustainable coffee production would help them to stabilise their income and reduce environmental pollution. Consequently, they have reduced their use of chemical fertilisers and pesticides and increased their use of organic fertilisers. They have stopped using herbicides, instead using natural wild grass as ground cover to retain moisture in the soil. When necessary, they only use approved pesticides 2-3 months before coffee harvest time. Besides, some gradually follow organic farming standards to eliminate synthetic chemicals. They have also increased the variety of crops they grow. Smallholders are trying to find sustainable solutions to increase the value and quality of coffee in the region while reducing pollution and climate change vulnerability and increasing biodiversity on their farms for future generations. However, cooperation among farmers, coffee companies, government agencies, and consumers is needed to solve the current dilemma. First, farmers must seriously adopt sustainable farming methods and improve the quality of coffee cherries. Secondly, the coffee company buys the coffee at a reasonable price or provides technical support to the farmers. Thirdly, the government must adopt reasonable policies to support and encourage farmers to grow coffee sustainably. Finally, consumers support the increased consumption of high-quality, sustainable coffee.

This study shows that during the transition to market orientation, practices such as accumulating social and cultural capital were changed and practised better



to support the transition to more effective coffee farming. This transition has provided many opportunities for small households in the coffee industry to improve their lives but has also brought many challenges due to fluctuations in coffee prices and climate change. Moreover, the study has also shown that some smallholder farmers are still hesitant to switch to sustainable coffee farming due to their family's economic conditions.

### **Conclusion and Recommendations**

In the 1980s, after Vietnam's reforms and the opening up of the market, farmers were free to develop economically, causing agricultural production to double like bamboo shoots after a spring rain. During the 1990s, the market price of coffee skyrocketed while the price of vegetables continued to decline, and farmers could not make money to cover their family's living expenses. Subsequently, a combination of government support, social capital and the dynamism of farmers led to a successful transition from growing vegetables to growing coffee.

Coffee planting has caused a transformation in local livelihoods and has also led to changes in local land use. The coffee boom triggered the diversification of Lam Dong province's cropping system. Because of fluctuations in coffee prices and climate change, to mitigate some risk, smallholder farmers in Lam Dong have learned to intercrop staple crops within their coffee trees and have switched to sustainable coffee growing to earn more money to maintain existing coffee fields. The study indicates that Lam Dong smallholder farmers could weather the coffee crisis without cutting down their coffee trees. It also shows how smallholder farmers in Lam Dong province currently perceive sustainable coffee cultivation. The result is sustainable coffee production, better coffee quality and economic benefits for farmers. They believe that the price of sustainable coffee will continue to rise.

The study also indicates that state authorities must implement sound policies to incentivise farmers to enhance coffee quality and promote technological advancements. These policies should advocate for organic and certified coffee production models to minimise environmental pollution and curb the spread of pests. Furthermore, it is essential to strengthen the connections among farmers, coffee companies, government authorities, and consumers. Facilitating farmers to reduce intermediaries within the coffee supply chain can significantly improve their livelihoods.

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**List of informants**

Name	Gender	Age	Coffee Areas/hectares	Ethnic
LD1	Male	58	0.6	K'ho
LD2	Male	41	0.5	K'ho
LD3	Male	39	0.5	K'ho
LD4	Male	47	0.6	K'ho
LD5	Male	68	1.8	K'ho
LD6	Male	59	1.2	K'ho
LD7	Female	59	1.6	K'ho
LD8	Female	43	0.8	K'ho
LD9	Male	56	1.1	K'ho
LD10	Female	65	1.6	K'ho
LD11	Male	59	1.5	Kinh
LD12	Female	49	0.6	K'ho
LD13	Male	61	0.7	K'ho
LD14	Male	48	1.2	K'ho
LD15	Female	55	1.3	K'ho
LD16	Male	62	1.0	K'ho
LD17	Male	58	1.2	Kinh
LD18	Female	55	0.8	K'ho
CD1	Male	72	2.0	Kinh
CD2	Male	68	2.0	Kinh
CD3	Male	46	3.0	Kinh
CD4	Female	65	10	Kinh
CD5	Male	47	1.0	Kinh
CD6	Male	67	5.0	Kinh
CD7	Female	52	4.0	Kinh
CD8	Male	49	5.0	Kinh
CD9	Female	66	1.5	Kinh
CD10	Male	59	1.0	Kinh
CD11	Male	56	1.2	Kinh
CD12	Male	66	1.5	Kinh
CD13	Male	64	2.0	Kinh
CD14	Male	57	3.0	Kinh
CD15	Male	58	3.5	Kinh
CD16	Male	49	3.0	Kinh
CD17	Female	60	5.0	Kinh
CD18	Male	38	2.0	Kinh
CD19	Male	39	7.0	Kinh
CD20	Male	43	2.0	Kinh
CD21	Male	41	2.0	Kinh

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CD22	Female	61	3.0	Kinh
CD23	Male	50	5.0	Kinh
CD24	Male	69	1.8	Kinh
CD25	Male	66	4.0	Kinh
CD26	Female	58	3.8	Kinh
CD27	Female	47	1.5	Kinh
CD28	Male	66	6.5	Kinh
CD29	Female	63	0.8	Kinh
CD30	Male	57	3.0	Kinh
CD31	Female	73	3.2	Kinh
CD32	Male	58	1.8	Kinh
CD33	Male	56	2.5	Kinh
CD34	Male	66	3.0	Kinh
CD35	Male	58	2.7	Kinh

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