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Contract Farming Through a Cooperative to Boost Agricultural Sector Restructuring: Evidence from a Rural Commune in Central Vietnam

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베트남 농업구조개혁과 협동조합의 계약영농: 중부베트남의 농촌을 사례로

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Abstract: The Vietnamese government has proposed contract farming through a new type of cooperative as an institutional innovation which aims to restructure the agricultural sector. However, policy changes often impact farmers, who bear the primary effects of the transition process. Understanding households' strategies for land use and livelihood is crucial for policymaking in the agricultural development field. This study was conducted in the rural Binh Dao commune in Central Vietnam. We analyzed household members' labor force changes and their livelihood behaviors after their participation in a contract farming scheme using qualitative analysis methods combined with geographic information system (GIS) support, based on secondary data and in-depth interviews of 190 farmers. Simultaneously, we created a digital map of the cooperative's production area to investigate changes in land use and production activities. The findings show that contract farming shaped the vertical coordination of the value chain from the farmers to the cooperative and agricultural product trading companies. Subsequently, it encouraged land use and labor efficiency due to mechanical support. In addition, it also increased productivity and protected farmers from market risks. However, despite its positive effects on agricultural productivity in this case, the contract farming scheme could not achieve the restructuring of the rural labor force toward non-agricultural sectors. Ironically, farmers in the Binh Dao commune tended to increase cultivable land during the agricultural restructuring program, rather than switching their labor forces to non-agricultural sectors. The lack of stable non-farming job opportunities in rural Vietnam results in challenges to the efficiency of agricultural restructuring programs. Consequently, farmers in the Binh Dao commune are still smallholder farmers, depending on the family labor force.

Key Words : Agriculture restructuring, Contract farming, Cooperative, Large-scale paddy field, Vietnam

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요약: 베트남 정부는 농업구조개혁을 위해 새로운 협동조합을 통한 계약농업을 추진하고 있으며, 베트남 농민은 정책에 따른 구조 전환의 영향을 직접적으로 받고 있다. 따라서 정책 과정에 따른 농민들의 토지이용 및 생존 전략을 이해하는 것은 이러한 농업개발정책에 있어 필수적이라 할 것이다. 이 연구는 중부 베트남의 전형적인 농촌 마을 중 하나인 빈다오社(Binh Dao commune)를 대상으로 이루어졌다. 이 논문에서는 먼저 GIS을 이용한 토지이용 변화 분석 및 190명의 농민과의 심층 인터뷰를 통해 계약농업 도입 전후의 농촌 노동력 구조와 생업활동의 변화와 그 원인을 분석하였다. 그 결과, 새로운 협동조합을 통한 계약농업은 농민-협동조합-농산물판매회사로 이어지는 수직적 가치사슬을 형성하고, 기계화를 통한 효율적 토지이용에 기여하여, 생산성을 향상시키고 농산물 시장가격의 리스크로 부터 농민들을 보호하는 순효과를 가져왔다는 것이 밝혀졌다. 한편, 이러한 긍정적인 효과에도 불구하고, 베트남의 협동조합을 통한 계약농업은 애초에 의도했던 농촌 노동력을 비농업부문으로 재배치하지는 못한 것으로 나타났다. 오히려 빈다오社의 농민들은 농업구조개혁 과정에서 경작면적을 늘리려는 경향이 있었다. 즉, 베트남 농촌지역의 제한적인 농외 취업기회로 인해, 빈다오社의 농민들은 기계화와 생산성 향상으로 생긴 잉여 가족노동력을 역설적으로 농업부문에 집중시키는 생존전략을 선택한 것으로 보여된다. 그 결과 빈다오社의 농민들은 협동조합의 계약농업을 통한 농업구조개혁에도 불구하고 여전히 가족노동력에 의존한 소농체제에 머물러 있다.

주요어: 농업구조개혁, 계약농업, 협동조합, 대규모 농지, 베트남

1. Introduction

In the context of the dramatic expansion of industrialization, agricultural transition is considered an inevitable solution to address the disparity in rural and urban development as well as the improvement of rural livelihoods (Briones, 2013; Luc, 2011; Nori, 2020). However, effectively moving away from agriculture remains a perplexing policy-making issue for many governments around the world. This issue is considered central to the development of agrarian countries, where agriculture is mainly characterized by smallholder farmers with relatively scarce resources. Ian (1992) emphasized that an essential characteristic of agricultural transition comprises activities associated with the reallocation of resources related to capital for land and labor. This means that, on one hand, this transition requires the enhancement of land productivity and work efficiency through mechanization with higher-value products. On the other hand, this transition should be accompanied by an increase in labor distribution from agriculture to other economic areas. This contributes to ensuring the livelihoods of farmers. Contract farming has long been considered a potential means of transforming smallholder farmers into entrepreneurial farming entities. It encourages agricultural transition and rural restructuring (Bellemare, 2018). Contract farming refers to an agreement between a firm or processor and a group of farmers in exchange for certain services in inputs and outputs (Ton, 2018). In this relationship, while firms secure a stream of quality inputs for processing, contract farmers

connect to output markets by being provided with inputs, credit, or agricultural extension i.e., the application of new scientific research to agricultural practices by implementing farmer education. Hence, most researchers consider contract farming a positive development for agricultural innovation in developing countries (Da Silva, 2013; Eaton, 2001; Otsuka, 2016). It has been widely applied in several countries, including Vietnam (Nguyen 2015; Otsuka 2016; Ton 2018). However, it is worth noting that any change in process has specific impacts on farmers, especially their livelihoods. Therefore, it is necessary to examine the degree of impact and devise strategies for farmers' livelihoods under the influence of contract farming.

Vietnam is moving toward industrialization and modernization through agricultural development and transition. By eliminating collectivization, the economic reform in Vietnam *(known as Doi Moi)*, which commenced in 1986, has enabled it to achieve economic growth and poverty alleviation (Liu, 2019). However, this transformation has also increased the dependence of agricultural development on smallholder farmers (World Bank, 2016). Although rice is the main crop in Vietnam, the production scale of households is only 0.2 ha on average, based on family labor forces (Markussen, 2017). The labor force in the agricultural sector is abundant (see Figure 1), but its contribution to Vietnam's gross domestic product (GDP) remains disproportionately minimal. The transition speed of agricultural labor in other sectors from 2000 to 2013 was still slow. Moreover, agricultural products still emphasize the quantity of agricultural produce rather than its quality, and its added value remains low. In addition, small and scattered plots hinder the efficient usage of farming technologies. Despite Vietnam's central government's efforts to implement land consolidation since the early 2000s, agriculture is still mainly characterized by traditional and small-scale production. This promotes comprehensive strategies to restructure the economy, with the nucleus being agricultural restructuring. In 2002, contract farming was introduced by the central government under Decision No. 80/QD-TTg (Hoang, 2013). However, this program was mainly implemented in the Mekong River Delta, and large-scale farmers were more likely to participate than smallholder farmers (Ba, 2019). Hence, in 2013, the central government issued Decision No. 899/QD-TTg i.e., a government policy approving a project to restructure the agricultural sector to increase added value and sustainable development (known as *Tai Co Cau Nong Nghiep* in Vietnamese, which means the "Agriculture Restructuring Program"). Following this scheme, a new format of contract farming through a cooperative was approached as an institutional innovation of the Vietnamese government. The nature of this program is the linkage between farmers and a newly established cooperative to create contiguous large-scale paddy fields. This program aimed to promote entrepreneurship in agriculture and diversify livelihoods in rural areas by pushing out rural populations from the agricultural sector. As of early 2016, 619,343 households had taken part in this program, with 169,851 hectares of arable land. Contract farming contributed to the formation of 2,262 continuous large-scale paddy

fields in the whole country, mostly comprising paddy fields (74%) (General Statistics Offices of Vietnam (GSO), 2016). It must be noted that policy changes often impact society (Keith, 2001; Le, 2018; Nguyen, 2015). These changes often demand that farmers adjust their land use and livelihoods to adapt to the transition process. In some cases, these modifications can deprive certain farmer groups of opportunities to engage in agricultural production. They lack access to non-agricultural means of livelihood and are fully prepared for job changes. It not only worsens the sustainability of the agricultural restructuring program but also puts a burden on rural development. Consequently, it is essential for policymakers to examine the use of land as well as strategies for farmers' livelihoods to ensure better adaptation to the transition.

This study was conducted in the Binh Dao commune, located in Central Vietnam, where local agriculture is currently undergoing a transition. Instead of being individual farmers on a small scale, the farmers at this research site have been oriented to contract farming with the new cooperative since early 2015. However, how did contract farming through a new cooperative affect their production scale and households' livelihoods? What did the farmers do to better adjust to these changes? This study uses data from in-depth interviews with contracted and non-contracted households, combined with secondary data, to answer these questions. Through qualitative analysis methods combined with geographical information system (GIS) support, our research aimed to explore the implementation mechanism of contract farming through the case of the Binh Dao cooperative. Primarily, the changing trends in the labor force of household members and behaviors in the means of livelihood of farmers after their participation in contract farming are described. This lays the groundwork for the study to build a better picture of the impacts of the agricultural restructuring program and adaptations to ensure the livelihoods of local farmers.

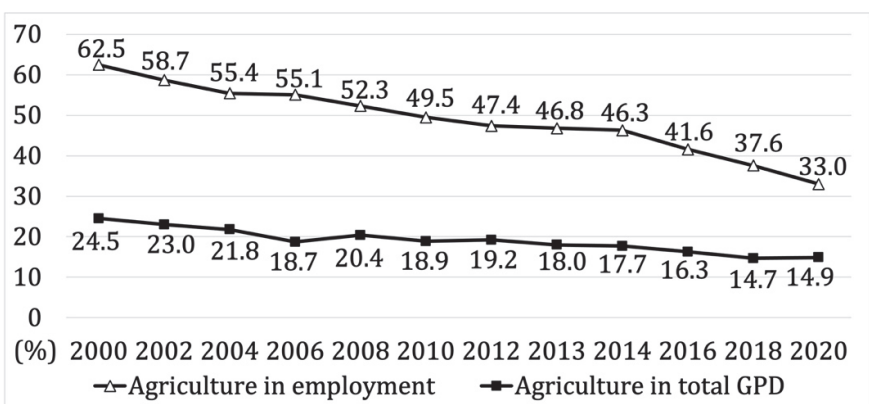

Figure 1. Vietnam's Agricultural Sector through GDP and Labor from 2000 to 2020
(Source: GSO, 2005, 2020)

2. Methodology and Case Study

This study used qualitative analysis methods combined with GIS. Secondary and in-depth interview data were collected from farmers, the Binh Dao Cooperative, and the People's Committee of the Binh Dao commune. Our first field survey was conducted in June 2019 to investigate the general socio-economic status of the Binh Dao commune and to obtain an overview of the contract farming implementation mechanism through the Binh Dao cooperative. The second field survey was conducted in April 2021 to collect data on land use, labor force status, and farmers' livelihood behaviors during contract farming.

We interviewed representatives of 190 households randomly selected from 1,160 households in Tra Doa 1 and Tra Doa 2 villages. These villages were the first areas in the Binh Dao commune to implement five-year contract farming. In addition, contracts between households and the Binh Dao cooperative had expired (2015-2020). We divided the selected households into two groups: 95 contracted households and 95 non-contracted households. Of the 95 contracted households, 45 were involved in rice contract farming, and 50 in land lease contracts. Our survey mainly focused on the implementation process of rice contract farming and leasing out farmland between the Binh Dao cooperative and households, land use status and agricultural production activities, and the household labor force. In particular, interviews with household heads focused on their decisions about contract farming types and individual occupational choices before and after their participation in contract farming. Based on this data, the livelihoods of contracted and non-contracted households were classified and analyzed to reveal the local livelihood transition during the contract farming scheme. The sample included current household members at the time of the survey. In addition, to investigate the changes in land use and production activities, this research created a digital map of the cooperative's production area with a scale of 1:2000, namely. This map was created based on the cadastral map records of 2015, combined with

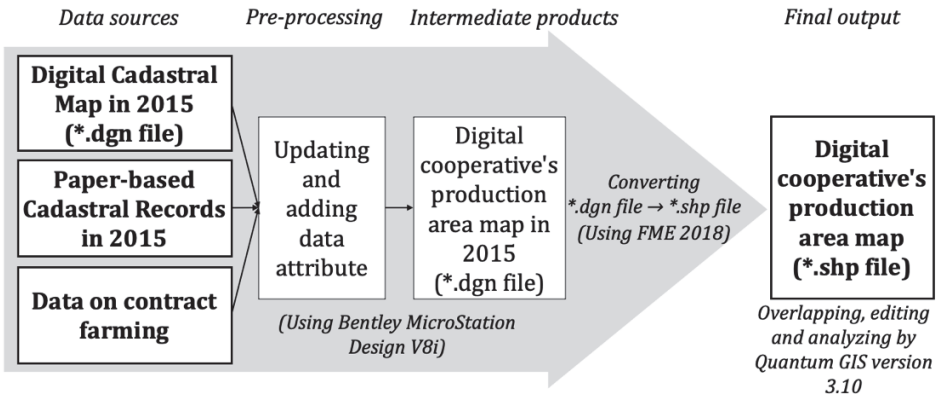

Figure 2. The Process of Data Standardization

reports on the contract farming from the cooperative and local government. In particular, the digital cadastral map in 2015 was updated using the Bentley MicroStation Design V8i software. Then, it was converted to shapefiles with the entire data attributes, such as the type of land use, name of the landowner, and type of contract with the cooperative, through the FME tool version 2018 Quantum GIS 3.10 software. A detailed flowchart of the data analysis is shown in Figure 2.

Our study was conducted in the Binh Dao commune, a typical rural commune located in the Quang Nam province, Central Vietnam (Figure 3). The population of Binh Dao was 7,273, with 2,209 households as of 2019 (Thang Binh Statistical Office, 2019). Of these, 84.4% i.e., 1,864 households, were farming households (Binh Dao Commune People Committee, 2019). The acreage of agriculture production land was 384.6 ha, accounting for 31.7% of the total natural area, including 354.6 ha of rice paddy and 30 ha of annual cropland (Thang Binh Statistical Office, 2019). The Binh Dao commune has four villages: Tra Doa 1, Tra Doa 2, Van Tien, and Phuoc Long. Following the land privatization policy, land allocation through equal land distribution per capita was locally implemented in 1993. However, similar to many provinces in northern and central regions, the consequence of this policy was land fragmentation (Markussen, 2017). Until 2005, on average, each household in Binh Dao possessed 7.9 plots, which were scattered across many locations in paddy fields, and exhibited differences in soil quality and accessibility to irrigation and field road systems. Significantly, the acreage of arable land per household was limited, with only 0.2

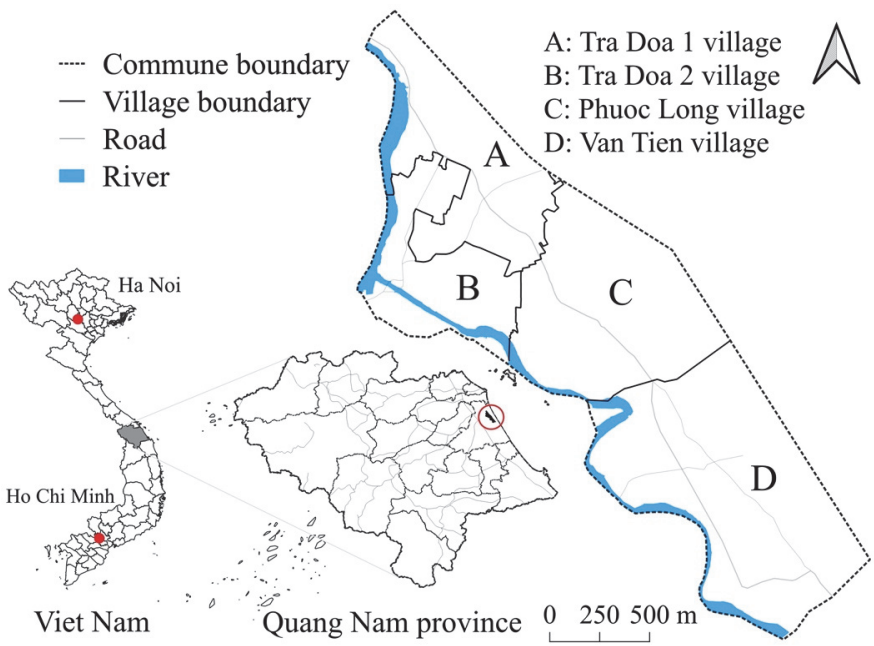

Figure 3. Location of the Study Site

Table 1. The Agricultural Production in the Binh Dao Commune

	1994		2006		2015		2018		2019	
	ha/year*	tons/ha	ha/year	tons/ha	ha/year	tons/ha	ha/year	tons/ha	ha/year	tons/ha
Paddy	736	3.3	580	4.0	602.5	6.0	597	5.8	551	5.7
Peanut	27	1.3	33	1.8	33.4	1.6	43	1.7	45	1.7
Sweet potato	165	22.2	82	9.6	15.9	8.8	13	7.8	13	8.0
Corn	-	-	-	-	-	-	8	5.6	8	5.6
Sesame	1	0.2	8	0.5	2.1	0.4	3	0.4	3	0.7
Cassava	-	-	-	-	-	-	3	16.7	1.5	19.3

Source: Thang Binh Statistical Office (2019)
* Total hectares of harvested paddy fields per year. A part of paddy fields in this commune is harvested twice a year

ha on average (The Binh Dao Commune People Committee, 2019). Hence, to tackle the extremely high level of fragmentation, the Binh Dao commune consolidated land in 2006. Although the number of plots per household decreased to 4.2 plots after land reallocation, the acreage of arable land per household was still maintained at 0.2 ha (The Binh Dao Commune People Committee, 2019). Farming in this area was mainly based on the farmers' families. The majority of on-farm laborers were parents. Besides taking up jobs in non-agricultural sectors, the younger generation still participated in agriculture in their spare time. The production situation of certain primary agricultural products in the Binh Dao Commune is presented in Table 1.

3. Research Results

1) Contract Farming Through a New Type of Cooperative

Until 2014, farming practices in the Binh Dao commune had not changed significantly. Small-scale farming by family members had been a popular practice. Table 2 illustrates the size of farmland per household in the Binh Dao commune for the years 1993, 2006, and 2020. Due to the principle of equal land distribution per capita encapsulated in Vietnam's economic reform, farm size per household in the Binh Dao commune mainly ranged from 1,000 to less than 3,000 m^2, with over 70%. As of 2020, the number of households with farmland over 3,000 m^2 accounted for only 15%. Given this production scale, paddy rice and other agricultural products in Binh Dao were mainly used for self-consumption. This surplus was sold to local intermediaries and/or local traditional markets. In addition, the number of laborers who participated in farming was still high. The field survey results in Table 3 indicate the labor structure of our sample. In 2015, 65.2% of the labor force in our sample maintained farming activities. Besides flexibly adopting a wide range of jobs, such as building, small-scale trading, sun-drying fish, and other such activities to increase their income, farming still played an essential role in their livelihood. The proportion

of household members engaged in non-agricultural jobs was 34.8%, but they were primarily in the younger generation. Under these subsistence characteristics of agricultural products in Binh Dao, contract farming through a cooperative was newly introduced to encourage local farmers' entrepreneurship. In this program, paddy fields were concentrated through contract farming between farmers and a cooperative to form continuous, large-scale paddy fields. First, the cooperative contracted with agricultural enterprises to supply agricultural products

Table 2. The Size of Farmland Per Household in Binh Dao Commune in 1993, 2006, and 2020

	1993		2006		2020	
	household	%	household	%	household	%
Less than 1,000 m^2	250	13.7	234	12.9	255	13.7
1,000 to less than 2,000 m^2	729	40.0	733	40.3	767	41.1
2,000 to less than 3,000 m^2	562	30.9	575	31.6	568	30.5
3,000 to less than 4,000 m^2	212	11.6	213	11.7	212	11.4
Greater than 4,000 m^2	68	3.7	66	3.6	62	3.3
Total	**1,821**	**100**	**1,821**	**100**	**1,864**	**100**

Source: Field survey in 2021

Table 3. Occupation of Household Members in the Sample

	2015		2021	
	Person	%	Person	%
Laborers who participated in farming	*445*	*65.2*	*334*	*48.0*
Laborers who only adopted farming	145	21.2	140	20.1
Laborers who mainly engaged in farming and extra activities in the remaining time*	152	22.3	87	12.5
Laborers who mainly engaged in non-farming activities** and extra farming in the remaining time	148	21.7	107	15.4
Laborers who participated in non-farming activities	*238*	*34.8*	*341*	*49.0*
Laborers who only adopted unstable non-farming activities***	96	14.1	163	23.4
Laborers who only adopted stable jobs before contract farming****	142	20.8	178	25.6
Retirement, death, housewife	*0*	*0*	*21*	*3.0*
Total	**683**	**100**	**696**	**100**

*Builder, workers engaged in sun-drying fish, painters, moto-taxi riders, etc.

**Wage laborers (restaurant and tourist services), small-scale traders, potters, builders, workers engaged in sun-drying fish, and salary workers (e.g., tailors, shoemakers, staff at tourist resorts and teachers).

***Wage laborers (restaurant and tourist services), small-scale traders, food vendors, or workers engaged in multiple activities at the same time.

****Full-time traders, shoemakers, tailors, staff at tourist resorts, teachers, policemen, office workers, drivers, etc.

Working household members over 15 years of age at the time did not include homemakers, students, unemployed persons, and retired members.

Source: Field survey in 2021

(primarily rice). The cooperative then consolidated arable lands under its jurisdiction, usually within a village, to create contiguous large-scale lands. In this process, farmers were allowed to choose between rice contract farming or land lease contracts. This program was expected to transform a smallholder farmer into a participant in an entrepreneurial farming entity, namely the cooperative, with the vertical coordination of the value chain from farmers to cooperatives and agricultural product trading companies. Moreover, it also aimed to release the agricultural labor force to non-agricultural sectors, which could promote livelihood diversification.

The Binh Dao cooperative was established in 2014 to implement an agricultural restructuring program. In fact, the old-style cooperative has existed since 2006, but its function was limited to managing irrigation systems and electricity for farming. In 2014, under the new Cooperative Law (2012), it was transformed into a new type of cooperative but was still under the strong political influence of the local authority. After its transformation in 2014, by taking over the production assets of the former, the cooperative diversified production services to members and increased the number of members. In addition to irrigation services, it began to provide input and output services such as: (1) fertilizers, pesticides, herbicides, and seeds, (2) land preparation, (3) harvesting, and (4) marketing. To manage continuous large-scale paddy fields, the Binh Dao cooperative also invested in agricultural machinery such as combine harvesters, tractors, and transplanters.

The detailed process of contract farming through the new type of cooperative is presented in Figure 4. The cooperative acted as an intermediary between companies and households. However, the cooperative's activities were managed and supported by the local authority. First, the local authority (at the district level) provided a part of the budget support for the cooperative's production to invest in agricultural machinery and upgrade field roads and irrigation channels. In parallel, the local authority connected with companies[1)] to supply inputs and outputs and introduces these companies to work with the Binh Dao cooperative. Second, at the beginning of the growing season, the company negotiated and signed a contract to produce, sell, or buy with the Binh Dao cooperative. In addition to providing inputs and outputs, these companies provided technicians and technical training in production to the Binh Dao Cooperative. Finally, the Binh Dao cooperative organized production in large-scale paddy fields under the supervision of companies and local authorities. Theoretically, according to the new Cooperative Law in 2012, the new cooperative should have been one in which farmers invested, managed, and shared benefits among members. However, the reality was not always successful, and local authorities politically managed cooperative management boards in many cases. This is more obvious when a closer examination into the mechanism of contract farming through a new type of cooperative is conducted, as shown in Figure 4, as follows:

(i) The cooperative selects locations to form continuous large-scale paddy fields with the

support of the local authority.

(ii) The cooperative submits its production plan to the local authority.

(iii) Based on the approved plan, the cooperative prepares two types of contract farming with farmers: (a) land lease contracts and (b) rice contract farming. Both contracts include the fixed rent, predetermined rent, and fixed price of paddy for all paddy fields during the entire five-year contract period.

(iv) The cooperative organizes a meeting with all households with paddy fields in the designated production areas mentioned in (i). Then, a representative of each household is requested to choose either type of contract mentioned in (iii).

(v) A household that chose rice contract farming has to use the seeds and other inputs (i.e., fertilizer and pesticide) provided by the cooperative. They can manage their paddy fields. At the end of harvesting, they must sell all the products to the cooperative.

(vi) The cooperative provides services for the use of machinery for activities such as plowing, transplanting, and harvesting. Households should pay a fee to the cooperative according to the acreage of their paddy fields.

The top-down approach, from the central government to local governments, was implemented in this process. The cooperative took responsibility for forming continuous large-scale paddy field land and organizing production. Households were only allowed to choose either type of contract prepared by the cooperative. If they chose the land lease contract, households could not continue to farm on land. Instead, they received a predetermined rent during the five-year period of the contract. In 2015, the Binh Dao cooperative paid 75 kg of dried paddy (equivalent to 600,000 VND or 26 USD[2]) per 500

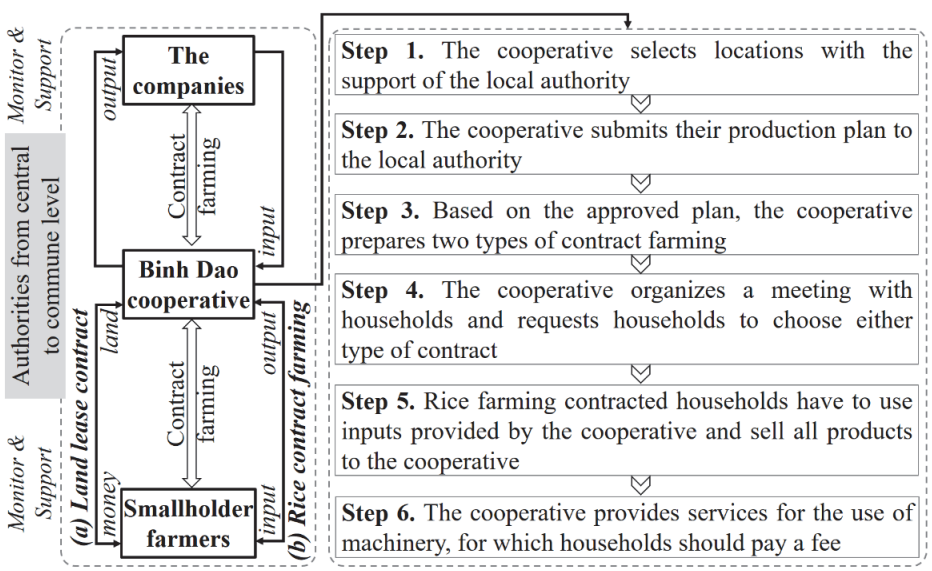

Figure 4. The Process of Contract Farming Through a New Type of Cooperative

Source: Field survey in 2019

m^2 per year at the end of the harvest season. This rent was relatively low compared with farmers' incomes when they cultivated paddy rice by themselves. In 2015, farmers' net profits from paddy rice cultivation fluctuated between 2,000,000–2,200,000 VND per 500 m^2 per year (roundly 87–96 USD). However, some farmers still accepted it because of their situation related to the acreage of allocated land and means of livelihood. If they chose rice contract farming, the cooperation allowed households to cultivate their paddy fields, including carrying out weeding, fertilizing, spraying pesticides, and drying of rice. However, they were required to follow the regulations imposed by the cooperative, such as changing from normal seeds to Filial 1 (F1) seeds i.e., hybrid seeds, and using the seasonal calendar, production process, and input services of the cooperative. The fixed price of paddy also guaranteed output from the Binh Dao cooperative during the five-year period. This fixed price was set at a price 1.2 times higher than the market price at the time of harvesting. In 2016, the Binh Dao cooperative paid 7,560 VND per kg of dried paddy (equivalent to 0.3 USD) at the end of the harvest season, while the average market price was 6,300 VND per kg.

2) Forming Continuous Large-scale Paddy Fields and Households' Choice

(1) Forming continuous large-scale paddy fields

Large-scale paddy fields were formed through top-down decision-making by the Binh Dao cooperative, combined with interference from the local government. However, due to the cooperative's approach, contract farming was implemented only in the designated production areas in the Binh Dao commune. Table 4 and Figure 5 show the acreage, number of plots, number of contracted households, and locations of designated production areas for large-scale paddy fields through contract farming. Data analysis shows that the designated production areas were extended year by year, scattered across seven locations in four villages in the Binh Dao commune. In 2015, the Binh Dao cooperative designated four paddy field locations for the concentration of nearly 30 ha from 411 households in Tra Doa 1 and Tra Doa 2 villages. In 2019, 35 ha of paddy fields were added. Then, the total acreage of consolidated lands became 65 ha at seven locations in all villages in Binh Dao. This accounted for nearly 20% of the total

Table 4. The Acreage, Number of Plots, Number of Household in Large-scale Paddy Fields by Village and Year

	YearLocation (village)	Acreage (ha)	Number of plots (plot)	Number of households (household)
Tra Doa 1	2015	5.0	82	78
Tra Doa 2	2015	24.6	377	333
Phuoc Long	2019	8.6	104	89
Van Tien	2016-2019	26.8	345	281
Total		**65.0**	**908**	**781**

Source: Field survey in 2021

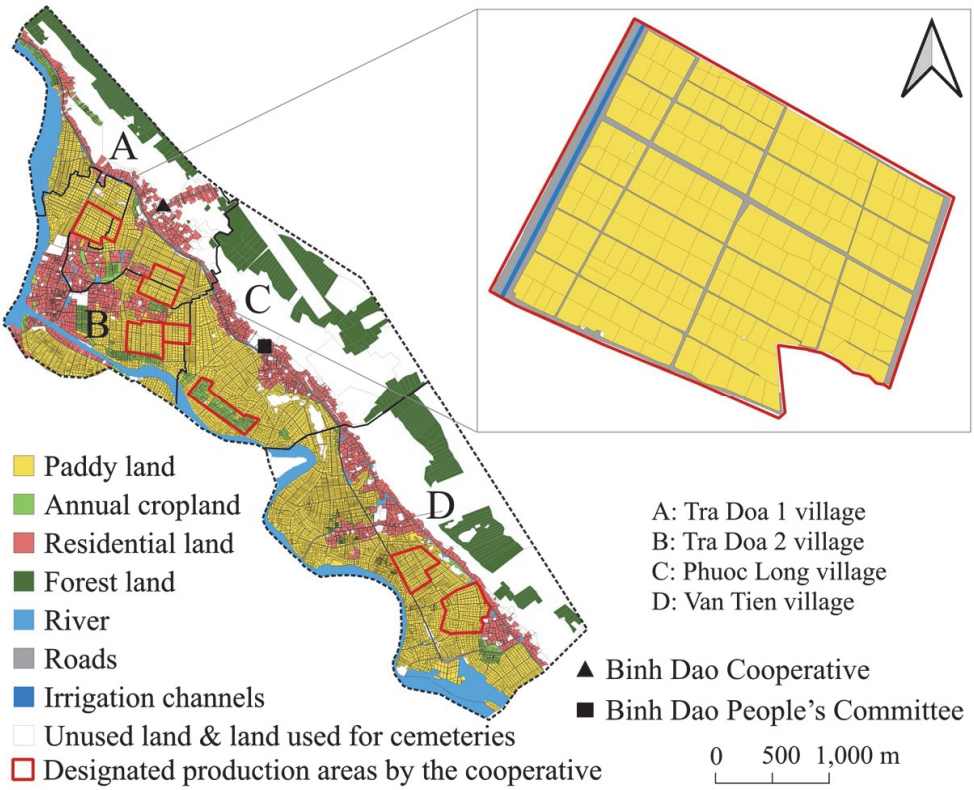

Figure 5. The Map of Cooperative's Production Area By the Contract Farming in Binh Dao Commune Until 2020

arable area of the commune. The average acreage of each large-scale paddy field was 9.3 ha, owned by nearly 110 households. Despite this small scale, its contribution may be in the form of the first step in changing farmers' production behavior through vertical coordination of the value chain mechanism.

(2) Households' choice

Table 5 illustrates the households' choices through the two types of contract farming with the Binh Dao cooperative. The results show that most households that owned paddy fields in the designated production area (772/781 households, accounting for 98.8%) entrusted their land to the cooperative. In particular, 617 households (79.9%) with 54 ha chose rice contract farming. 115 households (20.1%) with 10.5 ha leased out farmland to the cooperative. The in-depth interviews with farmers in our sample in Table 6 reveal some factors that influenced households' choices.

Regarding the rice contract farming households, 60.0% (27 households) claimed that the allocated farmland was relatively small i.e., only 0.2 ha per household on average, but nearly 40% (of primarily good soil quality) had belonged to designated production areas. Given the

Table 5. Households' Choice in Designated Production Areas

	Household		Acreage	
	Case	Percent	Hectare	Percent
Submitting land to the cooperative	*772*	*98.8*	*64.5*	*99.2*
Rice contract farming	617	79.9	54.0	83.7
Land lease contract	115	20.1	10.5	16.3
Refusing to submit land to the cooperative	*9*	*1.2*	*0.5*	*0.8*
Total	**781**	**100**	**65.0**	**100**

Source: Field survey in 2021

Table 6. Households' Reasons to Choose Type of Contracts

	Case	Percent
Rice contract farming	*45*	*100*
Small acreage of allocated farmland and trying the new production model	27	60.0
Saving time for some off-farm activities	12	26.7
Got old and shortage labor	6	13.3
Land lease contract	*50*	*100*
Small acreage of contracted and saving time for some off-farm activities	24	48.0
Rent in other larger and continuous plots for convenient cultivating	4	8.0
Got old and shortage labor	22	44.0

Source: Field survey in 2021

low-rent land, if households chose to lease out their farmland, their livelihood depended entirely on 60% of the remaining land. On the other hand, their livelihood meant relying on agriculture for a long time, but no program supported training or career changes after leasing out farmland. Thus, they chose rice contract farming to produce crops for their income. In addition, 26.7% (12 households) explained that they were of the view that the new production model combined with the support of machinery might have been able to help them save time on off-farm activities. The final reason for this was that 13.3% (6 households) revealed that their children did not help with farm work. Thus, they chose production cooperation to take advantage of the input and output support from the cooperative.

In contrast, 48.0% (24 households) of the land lease contract group claimed that the contracted land acreage within large-scale field areas was relatively small (only 500 m^2 to 700 m^2). Hence, they decided to lease out land to save time for non-farm jobs and earn more income. 8% (four households) were found to have decided to lease the land out related to the land fragmentation situation. Although land consolidation was carried out in 2006, households in our sample still held over four plots on average, and they were scattered across different locations in

paddy fields. Therefore, they chose to lease their land to the Binh Dao cooperative and rent in other larger and continuous plots for convenient cultivation. 44% (22 households, consisting primarily of old farmers) had similar reasons as those of the rice contract farming group i.e., related to their age and labor force. They explained that they were old, and their children wanted to focus on non-farming jobs. Thus, they decided to lease out their land because they were not strong enough to grow crops on the current total farmland.

The compulsory nature of the approach taken by the cooperative was also revealed through households that refused to participate in this program. Remarkably, nine out of 781 households (1.2%), approximately 0.5 ha of land, refused to submit land to the cooperative. This may have led to the formation of mixed seeds in large-scale fields. Thus, the cooperative used the local authority's power to swap household plots with the marginal area (see the example in Figure 6). The marginal area still belonged to the designated production area. In addition, this

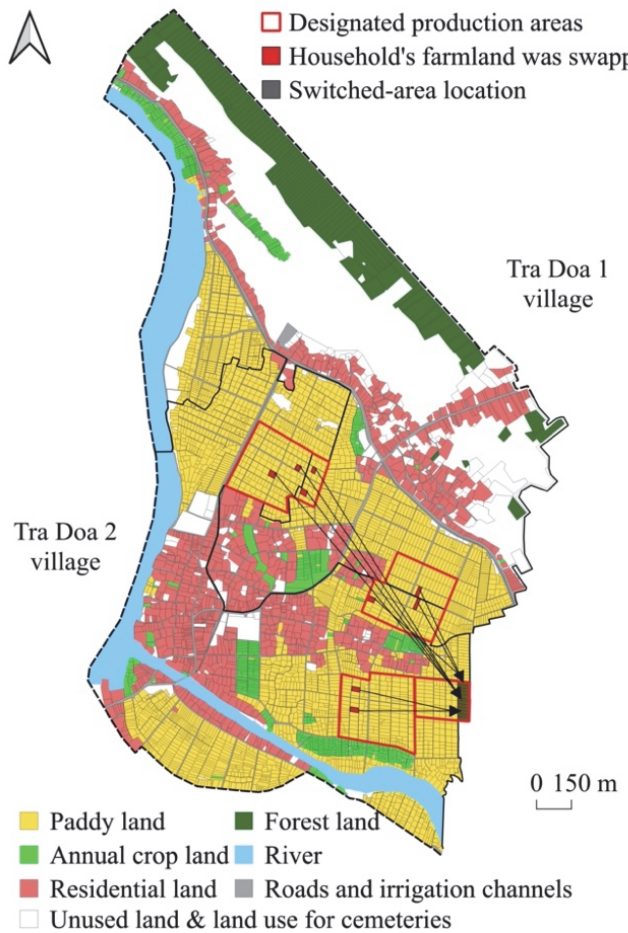

Figure 6. Switched-area Locations By the Cooperative

land switch was a temporary change within the five-year period, with no change on the administrative side[3]. After five years, at the time of ending the lease contracts, switched landowners received their plots of land. Although the switched land plots (550 m^2 per plot on average) had relatively good soil quality, their locations were quite far from the owners' houses (about 2-4 km). Some difficulties in cultivation were recorded because they moved around among their plots (over five plots per household, on average). These changes in land use status influenced farmers' behavior in terms of land use and livelihood activities.

3) Land use and Production Activities During the Period of Contract Farming

Entering into contract farming with the cooperative led to changes in household land use. The average amount of cultivated, contracted, non-cultivated, and newly cultivated arable land per household and the number of plots per household in both household groups are shown in Table 7. The average cultivated land per contract household was approximately 2,000 m^2 (over 90% was paddy land). However, nearly 40% of the land area was submitted to the cooperatives. Most of this land is ideal for farming because of its high quality, proximity to irrigation systems, transport routes, and lack of salinization. Regarding households in the rice contract farming group, their arable land acreage remained unchanged as they still cultivated crops on the contracted land area. By contrast, households in the land lease contract group had only 60% arable land for cultivation. With regard to the remaining free farming land (land in the non-contracted area), contract households complained that cultivation was not economically efficient due to lack of water, flooding, salinization, or complete dependence of some plots on manual cultivation and harvest. Thus, low crop productivity and capital losses occurred frequently. In addition, since 2011, two tourist resorts[4] have been constructed near the commune, which have attracted the rural labor force, resulting in the plots[5] of some households. These changes have forced contract farmers to search for other ways to adapt.

Rice contract farming households also tend to rent more land from others to compensate for their abandoned land. Thus, the total cultivated land on average of this household group

Table 7. Average Amount of Cultivated Arable Land in 2015 and 2021, Contracted Land, Non-cultivated Land, and Newly Cultivated Land Per Household (m^2/household)

	Total cultivated land in 2015		Contracted land		Non-cultivated land	Newly cultivated land	Total cultivated land in 2021
	m^2	plot	m^2	plot	m^2	m^2	m^2
Rice contract farming	1,989.2	4.8	867.2	1.4	296.0	1,378.2	3,071.4
Land lease contract	2,068.1	4.5	762.2	1.4	420.8	162.4	1,047.4
Non-contracted household	1,815.3	4.3	-	-	248.6	380.3	1,947.0

Source: Field survey in 2021

increased by 1,082.2 m^2 in 2021 to 3,071.4 m^2. Meanwhile, in addition to some households renting land from others, households in the land lease contract choose to rent their land out to others or abandon some plots. As a result, the average total cultivated land of households in the land lease contract group decreased to 1,047.4 m^2 in 2021. These choices also affect their livelihoods (which will be discussed in the later part).

Meanwhile, for non-contracted households, the total cultivated land increased slightly (by 131.7 m^2) between 2015 and 2021. Although some land plots were abandoned because of low productivity, they chose to rent land from others to compensate for their abandoned land and continue cultivation.

In addition to changes in land use, vertical coordination of the value chain through contract farming contributed to changes in the production activities of the contracted households. The data in Table 8 show that instead of planting a variety of seeds and facing risks to the market price, households in the large-scale field were guaranteed output and a purchase price 1.2 times higher than the market price. This encouraged an increase in the incomes of households that chose rice contract farming. Data from the in-depth interviews also revealed that the application of machines from cooperatives to farming activities contributed to saving farming time and labor for households. However, to ensure their income, they still cultivated their remaining farmland, which was not always economically efficient because of flooding, salinization, and pest infestation (mostly rats). Moreover, they traded the products of their remaining paddy fields in local markets with local traders in an unplanned manner.

4) Local Livelihood After Joining Contract Farming

As presented in Tables 2 and 3, given the small amount of allocated arable land, households in the Binh Dao commune flexibly adopted some

Table 8. Differences in Production Activities between Non-contracted Area and Contracted Area

	Non-contracted area (remaining farmland)Indicators	Contracted area (large-scale paddy field)
Input	- Households plant variety of seeds by demand - Free to use input services by demand	- Only plant F1 seeds by order of the cooperative and companies - The cooperative uses machinery for input services at the same time - Members of households manage their own paddy fields
Output	- Free to use output services by demand - Face risking output: Sell their product at local market and/or to local traders with the market price	- The cooperative uses machinery for harvesting at the same time - Guaranteed output: Sell all product to cooperative with fixed price: 1kg dried paddy (F1 seeds) = 1kg dried paddy (market price) * 1.2
Yield	250-280kg/500m^2/crop	315-325kg/500m^2/crop

Source: Field survey in 2021

non-farm jobs among household members to increase their income besides farming, even before 2015. During this time, farm work was mainly undertaken and maintained by the parents' generation and occasionally supported by their children. This tendency towards livelihood diversification continued after 2015. The young generation and laborers, whose income was mainly from non-farming activities, found it easy to stop farming and engage all their time in non-farming jobs. However, the farmers in our case study tended to intensify farming for their livelihoods. This is more evident when observing the livelihoods of contract households before and after they joined contract farming (see Table 9).

The data analysis in Table 9 shows that, except for one non-farming household before[6], the number of households that stopped farming and switched to non-farming activities rose by nine after 2015. It is also notable that they were households that chose the land lease contract model, and household members in this group diversified their livelihoods before 2015. Before leasing farmland to the Binh Dao cooperative, they leased some paddy field plots to others. In this group, three cases were found because of loss of workability and retirement. Meanwhile, in the six remaining cases, the income sources of these households did not come from agriculture but mainly from non-farm jobs. In other words, households with a complete transition to non-farming seemed to have previously adopted this trend, and contract farming was not the crucial reason for their choices.

In addition to flexibly adopting a wide range of non-farming activities to increase income, farming still plays an essential role in the livelihoods of both contract household groups. Households that combined non-farming activities with farming and maintained farming, besides extra activities, still accounted for a significant portion i.e., 83.1%, 79 out of 95 households). Of these, 42 households (44.2% of the contracted households, which was an increase of 3.1% in 2021 compared with 2015) chose to diversify their livelihoods among household members. 37 households (38.9% of the contracted households, which was a decrease of 4.3% in 2021 compared with 2015) still maintained farming in addition to some extra activities in spare time, such as mason work at construction sites, sun-drying of fish, and small-scale trading. These changes were observed in both contracted household groups. Notably, livelihood transition is rooted mainly in household members whose primary income is not farming. They were mainly young household members (average age, 44 years). In-depth interviews with contracted households revealed that the profit from some paddy fields was sufficient to meet the family's food and animal raising needs. Thus, before 2015, they were engaged in non-farming activities. After 2015, farming became easier because of the support of the agricultural machinery. Hence, they left farming to their household members (mostly the parents' generation or female laborers) or leased out paddy fields to focus on non-farming activities to earn more income. However, they only engaged in unstable, non-farming activities. Most male laborers were

house painters and mason workers at the construction sites. Female laborers' activities include sun-drying fish, small-scale trading, and serving local eateries. Although this work was wage labor, earnings of approximately 100,000 VND per day (equivalent to 4.4 USD) for trading, 80,000 VND per day (equivalent to 3.5 USD) for sun-drying fish, and 300,000 VND to 400,000 VND per day (equivalent to 13.1 to 17.5 USD) for mason workers could still help them pay their bills. However, after the COVID-19 pandemic, a returning trend toward farm work was observed in both types of contracted households[7]. The farm work of this household group was still undertaken and maintained by the older farmers (average age of 67 years). After 2015, changes in land use coupled with low crop productivity in some paddy plots forced them to adapt. They only cultivated contracted land and high-quality paddy fields. Simultaneously, they received paddy fields from their children, who had stopped farming or rented plots from others, to compensate for their abandoned land. As a result, 22 cases, including 14 cases of rice contract farming and eight cases of land lease contracting, chose to rent land from others to cultivate and increase their income.

The trend of intensifying farming for their livelihoods was also observed in the household group that adopted only farming i.e., in six cases

Table 9. Changes in Livelihood of Households between 2015 and 2021

		2015		2021	
		Case	%	Case	%
Contract households		*95*	*100*	*95*	*100*
Total	Only farming	14	14.7	6	6.3
	Mainly farming and extra activities	41	43.2	37	38.9
	Mainly non-farming activities and extra farming	39	41.1	42	44.2
	Only non-farm activities	1	1.1	10	10.5
Rice contract farming	Only farming	9	9.5	4	4.2
	Mainly farming and extra activities	22	23.2	25	26.3
	Mainly non-farming activities and extra farming	14	14.7	16	16.8
	Only non-farm activities	0	0	0	0
Land lease contract	Only farming	5	5.3	2	2.1
	Mainly farming and extra activities	19	20.0	12	12.6
	Mainly non-farming activities and extra farming	25	26.3	26	27.4
	Only non-farm activities	1	1.1	10	10.5
Non-contract households		*95*	*100*	*95*	*100*
	Only farming	13	13.7	9	9.5
	Mainly farming and extra activities	47	49.5	49	51.6
	Mainly non-farming activities and extra farming	35	36.8	37	38.9
	Only non-farm activities	0	0	0	0

Source: Field survey in 2021

(6.3% of contract households). They were farmers with an average age of 55 years, and included four rice contract farming households and two land lease contract households. Of these, two rented between 10,000 m^2 and 30,000 m^2 to plant F1 seeds and subsequently sold them to the Binh Dao cooperative. Four cases rented between 2,500 m^2 and 5,000 m^2 to plant normal rice seeds and sell them to local traders.

These responses were also observed in the non-contracted household group. 26 non-contracted households (27.4%) rented in paddy fields from neighbors to compensate for abandoned land and increase their income.

These results imply that the contract farming scheme did not achieve the initial goal of restructuring the rural labor force toward non-agricultural sectors. Farmers in the Binh Dao commune tended to increase their cultivated land during the agricultural restructuring program rather than switching their labor forces to non-agricultural sectors. Although household members had increased opportunities to join non-farming jobs, most non-farming jobs and extra activities were unstable and insecure. Thus, the lack of stable non-farming job opportunities in rural Vietnam raises challenges for the efficiency of agricultural restructuring programs.

4. Concluding Remarks

Countries with economies in transition are currently facing challenges in terms of agricultural restructuring. Based on evidence from a typical case in a rural area of Vietnam, this study reveals the mechanism of contract farming through a new type of cooperative in the ongoing agricultural restructuring program. In parallel, our findings revealed households' responses to changes in farming methods and land use.

Contract farming through a new type of cooperative in Vietnam was used as a tool to deal with the imbalance between abundant agricultural workforce and low small-scale self-sufficient productivity. In addition to promoting land efficiency and increasing productivity, this program aimed to restructure the rural labor force toward non-agricultural sectors. However, the lack of stable non-farming job opportunities in rural Vietnam raises challenges for the efficiency of agricultural restructuring programs.

Vietnamese agriculture has long been characterized by smallholder farmers with relatively scarce land resources. Hence, restructuring a modernized product value chain through vertical integration and contract farming is necessary for agriculture because it contributes to rural transformation. These findings indicate that contract farming contributed to the formation of large-scale paddy fields. The vertical coordination of the value chain from smallholder farmers to cooperative and agricultural product trading companies contributes to protecting farmers from market risks. In addition, the use of machines through cooperative farming activities saves farming time for households. These results imply that the contract farming scheme achieved

the goals of using land efficiency and increasing productivity. However, the aim of altering the labor structure by pushing farmers out of agriculture through contract farming schemes does not seem to have been met. Farmers kept their land by choosing rice contract farming, rather than leasing out their farmland to the cooperative. Moreover, they intensified their farming practices by renting more land. Although livelihood transition was observed in some cases, it was mainly rooted in young household members whose primary income sources were not farming. Given the insecure and unstable jobs, returning to farm work due to job loss was also recorded in our case study. In other words, agriculture is a form of livelihood insurance. As a result, farmers in the Binh Dao commune are still smallholder farmers who depend on the family labor force.

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주

1) Three companies participated in this program, including Southern Seed Joint Stock Company (2015–2017), Quang Nam National Seed Joint Stock Company (2018–2020), and Quang Binh National Seed Joint Stock Company (2021). These companies are national seed companies, whose branches are in the Quang Nam province.
2) Exchange rate: 1 USD = 22,900 VND.
3) There was no change in the land use right certificate among the switched land owners.
4) The two biggest tourist resort projects in Thanh Binh district which were built from 2011 to date are Vinpearl Resort & Spa Hoi An and Casino. These projects had attracted many farmers as workers.
5) These plots are mainly paddy fields. Cultivation in these plots is usually not economically efficient due to the lack of water, flooding, and salinization, or some areas are entirely based on manual cultivation and harvest.
6) This case refers to a non-farming household prior to 2015. Before leasing land to the Binh Dao cooperative, they leased all their farmland to others for a long time. Their income did not come from agriculture, and they had stable jobs among households' members.
7) In-depth interviews with farmers and local officials demonstrate that until the end of 2020, there were over 70% of people in the Binh Dao commune who lost jobs in construction sites after the COVID-19 pandemic.

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