

## **Land conversion to industrialization and its impacts on household food security in Red River Delta, Vietnam**

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### ***Abstract***

Since 1990s Vietnam is undergoing rapid industrialization with the national goal of becoming an industrial country. As a result, large tracts of agricultural land were converted to industrial zones and clusters. This paper analyzes the complex impacts caused by industrialization on household food security. Both qualitative and quantitative methods were applied to investigate how land conversion process to industrial companies affected food security of different groups of peasant households in Hung Yen province, the most rapid industrialization province in Red River Delta of Vietnam. The study showed that industrialization and neo-liberalism affected household food security in three aspects: the lost of large agricultural land area which did not ensure stable jobs for peasants; the decline of living quality as a result of environmental pollution and high living costs; and the lost of household self reliance on food, with 77 percent of surveyed households not producing enough food for their own consumption. Industrialization had created a new class structure in the Vietnamese countryside with the rise of landless peasants who survived by selling their labor and who are net food buyers. The study contributes to the research that link the analysis of household food security with livelihood systems in the processes interacting across scales, from the very local to the global.

**Keywords:** Industrialization, land conversion, household food security, peasant, Vietnam

### **Introduction**

After the failure of socialist industrialization during the cooperative period, intensive industrialization has continued in Vietnam since the late 1990s and has accelerated during the period 2003 – 2007, with the decentralization process to reach the national goal of becoming an industrial country by the year 2020 (Communist Party of Vietnam 2006). The industrial sector plays an increasingly important role in economic growth of Vietnam, from 22.67% in GDP in 1990 to 40.24% in 2009 (GSO 2009). The number of industrial zones and clusters has increased gradually in almost all provinces of Vietnam with a total of 219 industrial zones and clusters which use 61472 ha land in 2008 (ADB 2006; Khu công nghiệp Việt nam 2009). As a consequence, from 2000 – 2005, annually there is a loss of 73 000 ha of fertile agricultural land, which is suitable for food production in the high populated regions, is lost directly for industrialization and for its accompanying process of urbanization and infrastructural development (Vũ Hữu Sự 2008; Minh Khanh 2009). Food safety is also affected by the pollution of air, water and land sources as for the industrial development strategy so - called “*growth first and clean later*”.

The underlying industrialization process in Vietnam, as well as in other developing countries, is the historical association of industrialization and development (Barnett 1991; Chandra 1992). The policies on industrialization in Vietnam are closely to the transformation to modern sectors (industrial based economy) in which the economic growth is much more emphasized. The process of industrialization involves aspects of neo-liberalism with the development of private sector and economic liberation. One can not deny that along with the reform policies, industrialization has contributed to the economic development of Vietnam, especially with respect to the transition from a food shortage country during the 1970s-1980s to the second largest rice exporter in 2000s. However, at the local level, the rapid industrialization has also created complex and diverse impacts on peasant households, especially on their livelihood security since they have very little or no agricultural land, while the opportunities to have alternative jobs are scarce and the living conditions are getting worse and worse due to the pollution from the industrial companies surround their villages.

This chapter focuses on impacts of industrialization on food security at household level. It addresses firstly the relationships between land conversion and household food security from theoretical and literature debates. Then, two aspects of industrialization on household food security are focused. First, in terms of quantity, it is the food availability in which we will analyze how industrialization affects the way food enters the households, whether by producing or by purchasing. Second, in terms of quality, it is the food safety in which the environmental pollution caused by industrialization will be focused as the agents of food insecurity. The conclusion of chapter shows how industrialization reconstructs rural society in which there is the change in farmer's status from the food producers to food buyers as wells as the increasing of landless farmers who earn their living by selling their labor and whose livelihood is threatened by food insecurity.

The research is carried out in Hung Yen which is located in the central of Red River Delta. The region is called as "*second rice bowl*" which provides food security for a large population of Vietnam. Hung Yen is one among the provinces with the highest level industrialization in this region in terms of agricultural land conversion. Hung Yen has its natural area of 92309 ha with a very high population density (1229 person/km<sup>2</sup>) (GSO 2008). Industrialization has therefore had a deep impact on a large number of people. Hung Yen was a previous agricultural - based production province with 89% agricultural population; but recently it been committed towards rapid industrialization with 12.5% of its agricultural land converted to industrial development (Vietnamese government 2007). In order to make a comparison within Hung Yen province, 3 target communes are selected by its level of land conversion to industrialization. A total of 135 households in these three communes based on their economic background before industrialization were selected to do the questionnaire surveys. Beside that case studies were also applied in this research to provide materials for qualitative research and logical interpretation. Several techniques in PRA (Participatory Rural Appraisal) and ethnographic methodology such as group discussion, key informant interview and semi- structure interviews were also elaborated in this research to support the case studies. The combination of qualitative

and quantitative analysis allows one to understand the insights that do not occur while utilizing either type of methods on its own (Ellis, Kutengule et al. 2003) and it also supports to have a descriptive and interpretative analysis which is necessary in researches on the complex issues of interaction between land conversion and food security.

### **Land conversion and food security**

The phenomenon of agricultural land conversion reflects the change in land use system and relates closely to the land tenure and policies. In all over the world, although there are differences in land tenure which related to land access, land property and land use, agricultural land conversion happens as the results of socio – economic and political changes in the last centuries (Leblond 2008). Historically, the land conversion process had accompanied to the great social transformation of industrialization and the expansion of metropolis such as the land confiscation in industrial revolutions in England and other Western countries since the 19<sup>th</sup> century. In the development era, there has also been large agricultural land conversion in the developing countries in their transformation from agricultural - based economies to industrial- based economies nowadays (Barnett 1991; Chandra 1992). As a result the decrease of agricultural land and thus the decline of cultivated land for food becomes the global issues. *Food security* is defined in its most basic form as access by all people at all times to the food needed for a healthy life (FAO 2009). Food security can be addressed in different levels from global, national and local one. Food security from the national or global level often related to macro level production, marketing, distribution and acquisition of food by the population as a whole while the household food security related to the household assets in which land is the crucial one.

The researches on the interaction between land tenure, especially the agricultural land conversion, and food security are increasing recently. Land as well as its institutions are not the “exogenous determinants” of food security but they are “endogenous determinants” to food access (Maxell and Wiebe 1999; Borras 2009) The sustainable livelihood approach (Chambers and Conway 1991; Bebbington 1999; Ellis 2000) emphasized the role of natural capitals especially land in the sustainability of people livelihoods in which food security as its outcome. Land conversion is linked to livelihood vulnerability and is thus expressed mostly with the food security at the household level, the concept refers to “the ability of a household to have year round access to an adequate supply of nutritious and safe food to meet the nutritional needs of all family members” (Maxwell and Frankenberger 1992). The household food security is a key determinant for the nutritional status of the individual household members and it is reflected in the social, political and cultural context or environment by which the coping strategies of households occur (Renzaho and Mellor 2010). The sustainable livelihood approach is important in helping to see the interactions of not only resources and livelihood but also the power relations of the involved actors. Based on sustainable livelihood approach, this research analyzes the household food security from not only the medical or nutritional but also the well being aspects. It critiques also the bias and top - down perspectives in analyzing the phenomenon of

land conversion and its impacts because the causes of agricultural land decline in Vietnam as well as in other countries in regions and in the world are various. From the motions of involved actors, it can be voluntary or mandatory. There are both the supports and the critiques on its consequences as for the different interests and point of views in different period of time (Leblond 2008). This research shows the need to have the profound study on the wider socio – economic and political contexts by which the land conversion affected to household food security.

### **Land conversion process in Hung Yen province**

The nature of agricultural land conversion in Vietnam differs to the decline of agricultural land in other countries by its tenure system. In Thailand, farmer households have their ownership over their land, so that they make their own voluntary decisions on the conversion from agricultural to non - agricultural land (Leblond 2008). In Vietnam, the state as the representative of entire people claims its ownership over land. State allocates land to individuals, households, organizations and communities to use the land in certain period of time. The allocation term for agricultural land stipulated by Land Law 1993 is 20 years. Whenever the State needs the land for the purposes of socio – economic development or national education and security, the state has the power to withdraw land from the users and do compensation for them according to law. The holders of the land can not change the purpose of using land by themselves.

During the industrialization process, it is clear that the state power with this legal framework intervened in the land conversion processes in two aspects. On one side, the investors in industrial development have been favored while the farmer households and their agricultural production have been expensed. The disadvantages of farmer households expressed firstly in land tenure. As the holders of agricultural land, farming households do not have the right to own land but only land use right. In land conversion processes, farmers can not refuse to transfer their land to companies although 99% industrial companies in Hung Yen who take land from farmers are private companies. The reason is that the land belongs to the state and these industrial companies got the permission of the government to carry out their projects under the state policies. During our fieldwork, the farmers revealed that they can not say no to land conversion, the only thing that they can ask in order to have their decision on their land plots is how the land use right compensation could be?

The land use right compensation process in reality is the negotiation of three actors: the industrial company, the farmer household and the representative of local government. The price for land use right compensation is according to the price frame which assigned by provincial government annually. There is no information about what elements the province government based on to decide this price but the fact is that this price is always lower than the market price<sup>1</sup>. In this frame, provincial

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<sup>1</sup> The Land Law 1993 and 2003 stipulate 5 types of rights to land holders in which the exchange and release land use right is one among five rights. Actually, in the early 2000s, the agricultural land exchange in free market just starts and mostly happens in the South.

government classifies land into different types according to its role in agricultural production for example the fertility, the good irrigation system, the number of crops (rice crops) annually. This brings the second disadvantage of farmer households when their agricultural land is converted to industrial companies because the “good land” for agricultural production is different to the “good land” for industrial production. The fields located close to the roads or centers but are less fertile or far from irrigation system are treated as bad land for agriculture but they are really good for industrial companies. The compensation price of these fields is lower so the profit comes to investors.

The total compensation price depends on the provinces, in Hung Yen, the total land compensation includes 4 sorts:

1. The compensation for the land use right term (the left time since 1993, it is ironically the shorter term is left the higher compensation price is because the next compensation price is always higher than the previous one).
2. The compensation for crops or housing on that land,
3. The support of job finding or occupation changing
4. The bonus for quick clearance.

In some provinces, for example Vinh Phuc and Ha Tay (a part of Hanoi now), the compensation includes also the so - called “service land”, a type of land that the households can receive after transfer of their agricultural land for projects. The amount of this land based on the area that household has converted or the number of their labor depending on the policies of each province.

The above items of land use right compensation are considered the “hard part” (*phần cứng*) or formal items. It means that in land clearance process, there is also the “soft part” (*phần mềm*) or informal items depending on the power relations between the three actors involving in this process. It is not usually the corruption but the negotiation capacities of each actor. For example, the strong and good local government can ask investment companies some support for their farmers like support for the last harvest or for other social security. Certain households can ask for higher price for their plots if they give good reasons. Thus the land conversion process receives the satisfaction or dissatisfaction from farmer households depending on many factors such as the compensation price, the power of government, the household situation, the time to do compensation and of course the practical activities of companies after land conversion. In the three studied villages, the early companies coming into villages had no difficulty to receive land because at the beginning both farmers and local leaders showed great welcome to (*trai tham do – spread out the red carpet*) the companies with the hope of changing their life, with big amounts of money that they have never seen, with the hope of working in companies and the hope of finding alternative jobs to get out of hardy agricultural work. The disagreement of farmer households comes later on from several reasons. Firstly, it is unequal in compensation process as we mentioned above because the farmers found out that the price of their land is not as high as their nearby villages or some households get more than others. Second, it is the hopelessness of farmers when they realized that the promises of companies about job places are blew away in the wind. The villagers report that their members can not meet the requirements of companies

to have a job. Third, the farmers see also some companies just take their land and the wait for higher price to sell it to others, with no activity on that land. The fact is that it is not easy for the farmers to find another job elsewhere. The compensation money also goes fast with the living cost increasing along with increased pollution. These are the complaints and dissatisfaction of farmers in industrialized areas. It should be noted that farmer households see also the positive changes in their life. These include new houses that are built or repaired, improvement of infrastructure and the income of certain households which have increased as for they get the good jobs, their compensation money is used for buying land for example so that they that can take advantages from the industrialization process. However, as some households are lacking in labor to do farm activities or the households are in need of selling land to have money for their own business, such as debts or urgent matters, they become willing to transfer the land. In any condition, farmers had to find different strategies to respond to the changes. They were not static but dynamic to find the survive strategy to address their vulnerability.

The above part we have analyzed the common problems of farmer households in agricultural land conversion processes. This section does not go to the details of which groups of households will or will not get the advantages of industrialization. In stead, it tries to show the voluntary or mandatory of agricultural land conversion as well as the inequality involved in this process in the context of post - reform in Vietnam in order to further elaborate the vulnerability of households in term of food security. As the experience about the food shortage are still remained in many household members, hunger has just passed recently and the present demands of food safety are raising, both quantitative and qualitative aspects of household food security will be focused on in the analyze about the impacts of agricultural land conversion in industrialization in following section.

***Quantity of food security: Industrialization and food availability, landless and non stable job.***

Industrialization causes the decline of household food production in various aspects. Firstly industrialization has the direct impact on the decline of household agricultural land holding. Similar to other provinces in Red River Delta region, Hung Yen province concentrates its development strategy on promoting industrialization with the formation of industrial zones and clusters. Therefore, the agriculture land has been decreasing at high speed. From 2000 to 2005, on average, each year the agricultural land in Hung Yen decreases by 870 ha. In fact, the approved plan by the central government is always lower than the plan of the province and is out of date in comparison to the practical development of industrialization in Hung Yen. In 2005, total land of industrial zones and clusters in Hung Yen was 2128 ha while the approved plan of government was only 1894 ha (Hung Yen PPCs and Hung Yen DIP 2006). The land use plan of a province accelerates the area of industrial zones in the year of 2015 with the land use is 6155 ha and 9305 ha in 2020 (Mai Xuân Nghiên 2008). As the province in the central of delta, agricultural land conversed to industrial

zones and clusters in Hung Yen mostly used to produce rice and other food crops that sustain livelihood of peasant households.

**Table 1: Land use in Hung Yen**

TYPE OF LAND	2000 (ha)	2005 (ha)	2010 (ha)	Changing (2000 - 2005)		Changing (2010 - 2005)	
				Area	%	Area	%
Agricultural land	64177	59831	52217	-4346	-6.8	-7614	-12.7
Non agricultural land	27506	31972	39662	4466	16.2	7690	24.1
Unused land	626	506	430	-120	-19.2	-76	-15.0
Total land area	92309	92309	92309	0		0	

Source: (Hung Yen PPCs and Hung Yen DIP 2006)

The three researched communes bring also the common characteristics of industrialization in Hung Yen. It is the increasing number of invested industrial enterprises and at the same time with the high rate of land conversion for industrialization. This process had started from 2001 in Tan Quang and Luong Bang, and latter on in 2005 in Vinh Khuc commune. Among three communes, Tan Quang has the highest level of agricultural land transferred as well as the number of industrial enterprises.

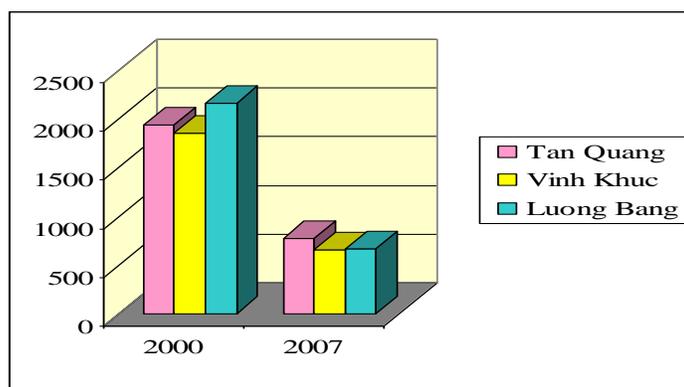
**Table 2: General characteristics of researched communes (2006)**

Indicator	Unit	Tan Quang	Vinh Khuc	Luong Bang
<b>Total land</b>	<b>ha</b>	<b>602,50</b>	<b>618,84</b>	<b>774,50</b>
<i>Agricultural land</i>	<i>ha</i>	<i>260,02</i>	<i>395,01</i>	<i>485,91</i>
<i>Agricultural production land</i>	<i>ha</i>	<i>245,62</i>	<i>395,01</i>	<i>460,23</i>
<i>Aqua-culture production</i>	<i>ha</i>	<i>14,40</i>	<i>0,00</i>	<i>25,68</i>
<i>Industrial zone land</i>	<i>ha</i>	<i>128,60</i>	<i>60,50</i>	<i>35,21</i>
<b>% of industrial zone land to agricultural land</b>	<b>%</b>	<b>49,46</b>	<b>15,32</b>	<b>7,25</b>
<b>Number of invested companies</b>	<b>company</b>	<b>52</b>	<b>27</b>	<b>19</b>
<b>Population</b>	<b>person</b>	<b>9237</b>	<b>10343</b>	<b>9260</b>
<i>Population density</i>	<i>person/km2</i>	<i>1533</i>	<i>1671</i>	<i>1188</i>
<i>Labor force</i>	<i>labor</i>	<i>5147</i>	<i>5715</i>	<i>4950</i>
<i>Number of household</i>	<i>household</i>	<i>2442</i>	<i>2673</i>	<i>2259</i>
<i>Number of village</i>	<i>village</i>	<i>8</i>	<i>11</i>	<i>4</i>

Source: Annual reports of communes

In the research sites, the target villages lost approximately 70 - 80% of agricultural land. All the rice fields surrounding the villages were confiscated and taken over by industrial companies. This has resulted, amongst others, the well managed irrigation system has been gone. The remaining agricultural land has been divided into many different pieces of land that households cultivate one rice crop and vegetables for their own consumption. The average land per household has decreased. In 2007, in the target villages, on average each household had 600 m<sup>2</sup> agricultural land while in some households there is no more agricultural land.

**Figure 1: Average agricultural land per household in 2000 and in 2007**



Source: Household survey, 2008

The results from household surveys and interviews reveal that before industrialization, agricultural production of households in the villages was highly subsistence under the form of household economy. On average, each household had about 2000 m<sup>2</sup> agricultural land. They produced two rice crops per year and one winter crop in the allocated land. They applied also new techniques in agricultural production and the rice productivity from 200 – 230kg/sao/crop (from 10 to 12 tons/ha/year). Households did also some animal production such as pig, poultry and cattle in their home settlements. The products from agriculture provided enough food for household all around the year and ensure stable life for peasants. The non – farm activities such as running small shops, retailing, artisan and food processing also contributed to the household’s income. From the household view, the model of household economy during 1990s had ensured the food security for households and had allowed for some savings of households, especially in some hard – working households.

Since 2001, the households had started conversion of their land to industrial enterprises. The companies compensated for households in cash with the amount of money based on the type and location of their land. Households used this money in different ways such as buying home facilities, building houses, saving in banks, finding jobs or investing in their own business. All surveyed households report that the compensation money did not help much for their livelihood. To earn living they

can not just rely on compensation from companies. The farmers also can not survive by very small area of land with agricultural production.

Beside the appropriation of agricultural land of the state, industrialization also causes other types of agricultural land transaction among individual households that has affected household food security. Some households had to sell all the left of their agricultural land or even their home land to have money to cover their debt, invest on their children' education, deposit on international migration or complete their new houses. As for the fragmented land since the Land Law 1993 and the land clearance for industrialization, under the policies of regrouping land for better users of state, some rich households in villages and also from cities buy the left agricultural land of the households to set up large - scale farms (*trang trại*). In fact, not all of this land is used for agricultural production but the land is fallowed and the land owners are waiting for the higher price to get profit.

From our fieldwork, in Tan Quang and Vinh Khuc communes, there is also the decline of communal land formerly that was contracted (*giao thâu*) to farmers for food crops production. In the way to find alternative jobs for landless farmers, this communal land has been changed to “*service land*”, anyone in the village who has money can buy that land. Previously, the households with large number of labor and lacking of land can rent the communal land to cultivate but now this land is used for non – farming activities.

The limitation of food availability of households also comes from less access to food production from resident land. Before, the home garden was used for planting vegetables, fruit trees or for animal production. Because of the increasing population, the expansion of houses and also the changes to home gardens to guest houses for rent, the households have no more food in their home land. It is clear that both agricultural land as well as home land now is used for the cash rather than for food.

The results from the surveys reveal that after land conversion households do not produce enough food, especially rice to eat. From food producers they become net food buyers. As the price of food increases year by year, the life of farming households who have lost their land become more difficult.

**Table 3: Rice buyer and producer in surveyed households**

Indicator	Total (n=135)		Tan Quang		Vinh Khuc		Luong Bang	
	HH	%	HH	%	HH	%	HH	%
<b>Rice net buyer</b>	104	77.0	36	80.0	37	82.2	31	68.9
<b>Rice partly producer</b>	31	23.0	9	20.0	8	17.8	14	31.1

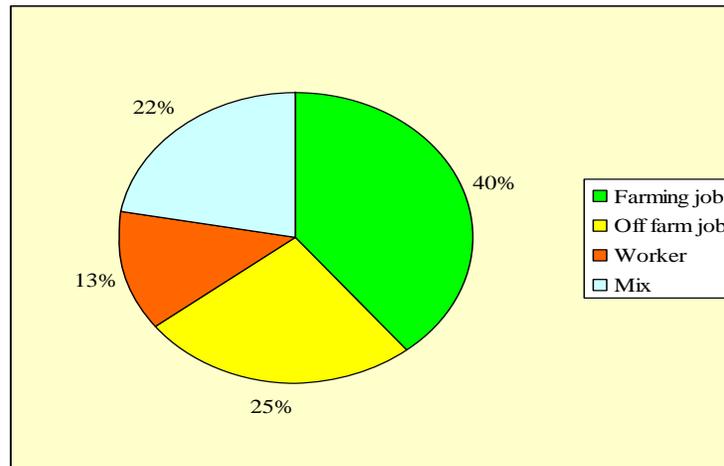
Source: Household surveys

The way food enters the household through the production limited as land holding of household for food has decreased. The other way to have food through exchange depends upon the jobs and income from of household members.

When companies came to the villages and took away the lands of farmer households, the household members became jobless and they had to find other jobs

by themselves. As the industrial companies do not ensure jobs for all farmers. Job for landless farmers after land conversion is therefore a big challenge for industrialization in Hung Yen in general and in three researched communes in particular. In Hung Yen, until 2008, there were 31033 households that had land conversion. It is the fact that local government as well as investors consider only in taking the land of farmers and then pay them the compensation; but is not responsibility for the life of farmers after land conversion. The time from land conversion to the day enterprises start its activities can last from 1 to 3 years, depending upon the type of industry. Some companies even do not have any activities but only take the land of households and wait for higher price to sell to others. In Luong Bang commune for example, there were 19 invested enterprises amongst which only 8 enterprises actually are operational. The remaining 11 enterprises did not start any operations while farmers expected to be hired in the new enterprises. However, as for the lacking of necessary skill and education level, many farmers could not find jobs in the enterprises.. The results from key informant interviews also show that those farmers who do get jobs can not adapt to the strictly working regulations of industrial enterprises. Some farmers had to stop working for enterprises because of low salary and long working hours (Xuan Mai 2007). The workers sign the contract to companies in the short terms and do not have social insurance. The low salary and high living cost lead to the fact that many farmers had to find another job or continue with farming activities. In the industrialization area, 67% landless households stay with their farming activities and only 13% household can follow a new job (Le Han 2007; Vu Huu Su 2008).

**Figure 2: Job of household members after land conversion**



Source: Household survey

Lack of jobs is the general dismal situation of landless farmers especially the middle and old farmers in the researched communes. However in each commune, the job issue brings its own significances. In Tan Quang, due to the high rate of industrialization and urbanization, many industrial enterprises have started their activities which have resulted in the demand on labor increasing. However, only the

young and highly educated farmers can find jobs. Beside that, as for the increasing labor demand of enterprises in Tan Quang, there are many migrant workers from other provinces coming to work in the communes. This has caused competition for jobs between the local and migrant workers. There is no available number of local peoples who work for industrial enterprises, however according to local leaders in comparison to migrant workers the number of local peoples is much smaller. With the coming of migrant workers, the households in Tan Quang also can find other jobs such as providing food, housing and other service to the workers. However, the income from these activities is low and unstable. Building guest houses for example, the households report that they invest about 50 – 70 million VND to have 5 rooms for rent. Each month they can earn 1.5 million VND so that after 3 to 5 years they can cover their capital and then they earn profits. However, in some particular period, especially during the 2008–2009 economic crisis, no worker came.

In Vinh Khuc and Luong Bang, the number of enterprises is less than in Tan Quang. Among them there are very few industrial enterprises which started its activities. Therefore landless farmers have limited chance to work for enterprises. They have had to go to other districts or provinces to find jobs. There is no migrant worker coming to stay in the communes also. Thus finding jobs for farmers is truly a big challenge of industrialization in these two communes.

The household surveys show that within household budgets, food is the main expense. The main part of income from non – farm activities is used firstly in buying food for their daily consumption. Household members, especially the middle aged and elders, who had experienced food shortages during the wars and the cooperative period, recognized profoundly how food is important in their lives. The way that household had to buy rice and no more rice storage is the unstable life according to the view of many old farmers.

**Table 4: Food share in household expense**

<b>Commune</b>	<b>Food expense (thousand VND/HH/month)</b>	<b>Food share in HH expense (%)</b>
Tan Quang	1248	60,06
Vinh Khuc	1229	52,19
Luong Bang	797	48,16

Source: Household survey

It is clear that the overall goal of industrialization is economic growth and in fact some aspects of development such as infrastructure, housing and income of small part of farmer households are improved. However, industrialization also leads to changes in the food security of farmer households. Especially to those households that have limited access to agricultural land at the same time can not find good jobs. The decrease of agriculture land caused by industrialization has threatened the food security and the livelihood of poor farmers. With the high population density in Red River Delta region in general and in researched communes in particular, the

decreasing of agricultural land put higher pressure on food security. In all surveyed households, rice and other foods they produced were not enough for their daily consumption. Some landless households do not practice any agricultural activities. They had to buy food from markets while the food price is increasing in recent years as for food crisis and the high inflation rate in Vietnam. From their status as owners of the land, farmers have now become wage laborers and from food producers, farmers in the industrial areas have now become net food buyers. They have lost their self reliance on food and instead now depend on the food market. Not all farmers get the good jobs and high incomes. While the living cost is high, food prices have fluctuated according to national and international markets; while the share of food has still remained the main part of household expenses. As such household food security must be taken into account during the industrialization process.

### ***Quality of food security: industrialization and food safety***

Industrialization has also had an impact on resource management and environmental pollution that has in turn has an effect on food safety and the health of local residents. Since the enterprises began their operations, environmental problems in the researched sites have become the center issue for the villagers. Village - headmen reveal that during every community meeting in recent years, villagers have been complaining about the pollution from nearby companies that surround the villages. From practical observations and group discussions we found that the environmental pollution in the research sites was caused by a range of factors.

Firstly, there is a lack of well planning blueprint for setting up the industrial zones or clusters. In terms of location, almost all land clearance for industrial zones has been agricultural land, which is fertile and suitable for food production. In order to favor the investors, local government provides land for the companies where ever the companies want to build their factories. In Hung Yen province, the industrial enterprises are located mainly along the National Highway Number 5, Road 39, in the center of districts and in the town. These are the areas that have good infrastructure that attract investors but these are also the areas for rice production and other food crops. However, because of bad plans, the industrial companies have destroyed the irrigation systems; which have caused floods or resulted in the pollution of the remaining agricultural land. Thus agricultural land has not only been lost but has also been polluted by the enterprises. Bad planning has also been reflected in the bad arrangement of the industries or products produced by companies. This has caused further pollution. In the researched sites, there exist all kinds of industries. The products of these industrial enterprises are various; such as food processing, footwear, beverages, construction materials, motorcycle production, wood processing and food for animals. Hung Yen government accepts all investors without considering what kind of products the enterprises will produce and where they can locate their factories. For example, the food processing enterprises are located next to the enterprises which produce construction materials. The medicine enterprises are located next to steel enterprises. In Tan Quang commune, the industrial brick company is located in front of the gate of the village. Regardless of the seasons, the dust and heat from this company follow the wind and blows into the village. While

the other companies which surrounded the home settlements has resulted in smoke, bad smells and dust affecting on not only trees, crops but also the health of villagers.

Secondly, the environmental pollution caused by industrialization derives from government policies “*growth first and clean later*”. The purpose of industrialization in Vietnam, as well as in Hung Yen, aims at firstly economic growth but pays less attention on the environment. Within the researched communes, the family - based private enterprises are dominant. The scale of these enterprises is small both in term of capital investment and the number of wage laborers. Furthermore, waste treatment systems in almost companies are lacking or if this system does exist then they are not working properly, wither because of low technology or because of illegal activities. The looseness of controlling over these activities by the government, whether due to the lack of its ability or by corruption has been the cause of serious environmental pollution.

The villagers report that since the setting of industrial companies their village has become dusty. They have had to suffer bad smells and smoke in all seasons throughout the years. Water in the river Bac – Hung – Hai is no more clean. Before, people could swim and take a bath in the river. Now this river contains waste water from enterprises and rubbish from villages nearby. The vegetable fields which were planted in the sides of companies along with the water source for these vegetables is also highly polluted. Diseases and pests have destroyed and affected these crops. Farmers in Tan Quang complain that their rice fields in recent years are eaten by rats coming from enterprises surrounding their village. Some households said that their rice yield decreases 50-70%. For other plants, they have had to spend more money on pesticides. Avian flu and blue ear pig disease has threatened hundreds of husbandry households in the researched communes. The households in the target villages reveal that they have had to use ground water for their daily consumption; some digging to the depth of 30m but even then they are not sure whether the water is clean or not. Some households say that they had to buy bottle water for drinking and cooking instead of using water from their well. Food safety is a high concern of villagers since from production to daily life the households in industrialization areas suffer bad environmental pollution.

**Table 5: Household opinion on environmental problems**

Indicator	Affect	Total (n=135)		Tan Quang		Vinh Khuc		Luong Bang	
		HH	%	HH	%	HH	%	HH	%
Water source	Yes	94	69,6	41	91,1	27	60,0	26	57,8
	No	41	30,4	4	8,9	18	40,0	19	42,2
Waste	Yes	94	69,6	37	82,2	26	57,8	31	68,9
	No	41	30,4	8	17,8	19	42,2	14	31,1
Smoke	Yes	98	72,6	42	93,3	24	53,3	32	71,1
	No	37	27,4	3	6,7	21	46,7	13	28,9

<b>Bad Smell</b>	Yes	109	80,7	44	97,8	29	64,4	36	80,0
	No	26	19,3	1	2,2	16	35,6	9	20,0

Source: Household surveys

### **Conclusion**

We have focused on the industry – agriculture interface in which the impacts of land conversion policies to household food security are emphasized. This research on the industry – agriculture interface contributes to the debates on the dynamic interactions between land tenure and food security which have been addressed by many scholars (Maxell and Wiebe 1999). From the profound analysis of the specific characteristics of land tenure in the particular context of post - reform in a socialist country, this research shows the complex consequences of agricultural land decline on food security. Based on sustainable livelihood approach, this research contributes a holistic perspective on analyzing household food security. It is not only from the medical or nutritional but also the well beings aspects. It is not only the coping strategy but also the wider socio – economic and political context by which the strategy occurs.

We have discussed in this chapter two aspects of food security at household level- which are food availability and food safety. This dual focus adds to the concern about the food security in Vietnam since it is overemphasized on quantity rather than quality. The important change of household food security caused by industrialization is not only in quantitative aspects but also in qualitative aspects. Further it is also the changes in the socio-economical status of peasant households. Before industrialization, farmer households are net food producers. Since their land was transferred to industrial companies, they have become smallholders or agricultural laborers; this has resulted in them becoming net purchasers of food as they do not own sufficient land to produce enough food for their families. The higher food prices make net food buying households in rural areas worse off. The food safety of households in industrial areas is threatened by increasing environmental pollution. This research contributes also to the debate on industrialization and modernization in Vietnam nowadays. This research also helps to avoid the bias and top down perspective in analyzing the phenomenon of land conversion and its consequences through the explanations about the voluntary and mandatory motives and motions of the involved actors. The goal of government is that industrialization will solve the problem of poverty. Industrialization aims at first more effective economic development. Toward households, industrialization is thought to provide greater opportunities to have higher incomes, job opportunities, movement of labor from agriculture to the industrial sector and in the process achieve development. However in reality, the development of industries and the industrialization process has instead created a peasant class differentiation and a new class structure, in which there is the rapidly rising of rural landless peasants who are largely separated from the means of production, who survive by intermittently selling their labor and who are net food purchasers. They have now become the rural proletariat in Vietnam society now.

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