

# Land grabbing, conflict and agrarian-environmental transformations: perspectives from East and Southeast Asia

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### Crop booms and changing land use and land control in Thailand's agricultural frontier

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## **Abstract**

This paper is a social science research focusing on issue of land deal and land control intersections with political economy, political ecology and political sociology of agro-fuels production in Northeastern Thailand. Since biofuels represents a form of renewable energy, the recent expansion of agrofuels is a result of the Thai government advocacy for use of biofuels in replacement of use of non-renewable energy. Increasing demand of biofuels has directly related to expansion of land being used for production of agrofuels such as cassava, sugarcane, soybean, etc. This paper adopts concepts of land deal and land control given by Peluso and Lund (2011) to examine a recent expansion of cassava crops intersections with land use and land control in the border zone of Thai-Laos. In addition, the paper adopts concept of frontier provided by Hirsch (2009) to analyse the rise of new form of agrarian capitalism in remote areas and forest land in the border zone of Thai-Laos. As the forest land and borderland are transformed into a new place of cassava production, many forms of new frontiers in the borderland emerge. For instance, a new frontier between forest land and agricultural land, a new frontier between borderland of Thailand and Lao PDR, a new frontier between domestic and export-oriented agricultural productions, a new frontier between food and non-food productions, etc. Moreover, the paper adopts concept of the politics of flexible crops and commodities provided by Borras (et al. 2014) to explore different ways and reasons that land has been used for producing different crops such as rice, rubber trees, fruit trees and cassava as well as the switching between one crop to another in a changing context. Therefore, the change in land use in agriculture in the Thai-Laos border zone has significantly contributed to changes in land control, land rights and rural social differentiation. This paper will provide insights about actors and their roles in transforming borderland and forest land into the new frontier of agrofuels production. Moreover, economic benefits as well as ecological and social constraints are examined to understand social and ecological impacts of the agrofuels production in the borderland.

## Introduction

The spreading of environmentalism in South East Asia after 1980s led to policies for land protection, particularly forest land. In this context, frontiers of resource struggle became one of the most concerned issue among academics in social science. Frontiers of resource struggle is a confrontation between different social groups to claim their rights to access and use natural resources. The main groups involve in this are the government equipped with natural resource conservation policies and the people who want establish their rights to these resources (Hall et al., 2011: 63). In such situation, from geography point of view, Hirsch (2009) suggested “agricultural frontier” concept which deals with the situation where the expansion of agricultural land invades into forest zone which was “closed” by the government to comply with the natural conservation policies. Agricultural frontier, therefore, means the area which agricultural lands meet the government’s protected land and are valued by both conflicting parties but for completely different reasons. This then creates high dynamics of change.

From the late 1980s, Thai governments have been prioritizing forest conservation policies. This is the same period that there is an increasing demand for cash crops especially those from the highlands which are the “agricultural frontier” areas around Thailand. It is important for the conservation and social justice to understand the motivation and the changes in this agricultural frontier. Currently, the area around the forest zone under the Agricultural Land Reform office is more than 43 million rai<sup>1</sup> and there is at least 10,866 villages in and around forest zone (Narkviboonvongsa et al., 2007). In the past, there has been a prolonged conflict between the governments and people on the issue of land use in or around the forest zone. The conflict has been prolonged from government to government. Several committees had been set to solve this issue. Recently, with the military government and its absolute power, the conflict has escalated and become the most frustrated issue for many people (Focus On the Global South website<sup>2</sup>)

This article presents a case study on agricultural frontier in Ubon Ratchathani province. The case study area is in the agricultural frontier in the east, adjacent to Lao People's Democratic Republic. The agricultural frontier locates around a national reserve forest and a wildlife reserve. An expansion of rubber tree plantations in the past and cassava farming in the more recent years to answer to the demand from a large bio energy company in Ubon Ratchathani province causes the dynamic of use and access to the forest zone<sup>3</sup>. This article bases from the research that obtained data from the fieldwork in 2014. It demonstrates the power of the market that changes the way people use and access the land with various strategies; the challenge and the ineffectiveness of the political machinery to conserve forest zones and; the way the market – which is a part of the socio-economic structure – becomes the mechanism which drives the over exploration of the land, the forest and the environment in which responsibility from the producers and the consumers is not required. The author suggests that such development is not sustainable and must be amended according to the following suggestions:

## The Dynamic of Agricultural Frontier in Border Area

The expansion of agricultural land is a result of national development which is inseparably influenced by global economics. After Thailand signed the Bowring treaty in 1855, Thai rice became a part of the international market. Since then rice cultivation has expanded from the basin along sides of major rivers in the central to small distributaries around the country. The expansion continued and even more rapidly in 1960s when Thailand became one of the world’s largest exporter of field crops. These field

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<sup>1</sup> 6.25 rai is 1 hectare

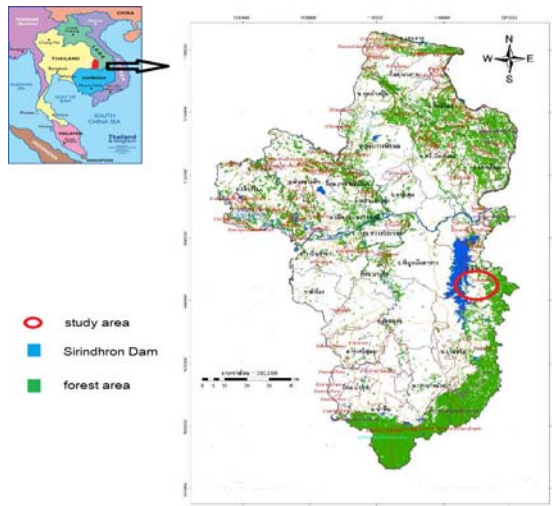
<sup>2</sup><http://focusweb.org/content/statement-arrests-and-evictions-forest-dwellers-thailand> accessed on 7/03/15

<sup>3</sup>In this study “forest” means any natural forest, “forest zone/area” means forest as defined by the government (i.e. national forest research or wildlife and plant reserve) and not necessary natural forest.

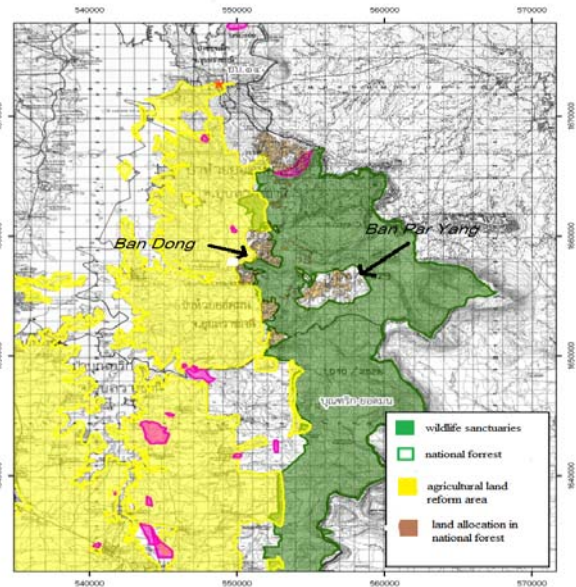
crops including sugarcane, corn, cassava and jute grow best in highland and causing more expansion of agricultural land penetrating into regions with highland and plateau around the country (Phongpaichit and Baker, 2003; Buch-Hansen, 2003; Hirsch, 2009). Ubon Ratchathani which is the field location of this study used to be one of Siam (former name of Thailand)'s major city, about 600 kilometer away from Bangkok. During the cold war, the city was a political hot spot as it was under the influence of the communist party and stands on the national border adjacent to a neighbor country with different political views. To understand the dynamic of the agricultural frontier in this area, three factors must be considered; political instability; the expansion of economic space and; forest conservation policy.

The complex process of landscape change can be demonstrated by looking at the history of settlements of the people in the case study (hereafter referred to as Ban Dong). Ban Dong's increasing population was prompted by the following three factors started in 1960s. First, "for national security route" road was built to fend off communism, concessions for timber harvesting were available and the government would encourage people to establish their settlements in the area. The government believed that this would weaken the communist power over the region (Natetayarak and Ondum, 1992; 198-201). The second factor is the unintended consequence from the dam that was built to generate 36,000 kW (Sirinthorn Dam). This was considered the use of land for economic reason. This, however, took up 200,000 rai of tropical rain forest which is home to more than 30 settlements. Many people were affected by the floods caused by the dam. These people had to look for the new location which includes Ban Dong which is on the edge of the reservoir created by the dam. The third factor is the expansion of the new cash crops which are cassava, corn, sugarcane and, jute. The road networks allow these crops to be transported to the central easily via the national roads or the trains. These are the factors that caused the expansion of human settlement in Ban Dong.

In 1974, the government started adopting forest conservation policy. The case study area became national reserve forest as one large piece of land cover areas along the border. It was then divided and some parts were re-categorized. Deteriorated forest was re-allocated for agricultural reformation in 1987. Most recently, in 2009, a portion of healthy forest was announced as a wildlife reserve. By law, this area is under strict protection. From this we can see that the landscape of the area is shaped by the forest land allocation for residential settlement and for agricultural use. Not long after that, the resource frontier was officially shut down by the government's policy on forest conservation. Ban Dong was forced to stay within a limited boundary, fenced in by the reservoir on one side and the national forest reserve and the wildlife sanctuary on the other side (see map 1).



**Map 1** Study Area



**Map 2** State's land control in various types

Despite being forced to stay within the boundaries, the people of Ban Dong was impacted by the demand of cash crops from outside the boundaries. Similar situations such as this occurs across South East Asia and drove the shift in land use where forest land was turned into agricultural land (Hall, 2011). At Ban Dong, the demand for latex and cassava had driven another wave of agricultural land expansion. The increasing demand of latex in South East Asia came in 1980s, however the rapid and widespread demand or the “boom” came in the early 2000s. Part of this boom is the economic expansion in China. The boom of latex demand in East Asia occurred simultaneously as the boom in Indochina countries (Fox and Castella, 2010). The boom lasted until the past 2-3 years, the price dropped, which was an impact from the fluctuation of Chinese economic and the oversupply of the latex. Ban Dong turned into cassava cultivation which there was a demand from the bioenergy market. Thailand increased the ratio of energy from renewable sources aimed to be a major regional renewable energy producer (Kumar et al., 2013). An ethanol production factory from cassava was established in Ubon Ratchathani and has the highest production capability which results in high demand for cassava.

At the beginning of 1990s, according to Ban Dong residents, there weren't many rubber tree plantation. In 2008, settle lite image showed 18,301 rai of rubber tree plantation in Ampor Sirinthorn (Ministry of Agriculture and Cooperatives, 2008) where Ban Dong is situated. Among this, approximately 3,200 rai locates in Ban Dong area. The hidden agenda behind this phenomenon was a huge shift in land use and land own. Local people change their short rotation crop cultivation to rubber tree plantation. Lands were sold to the outsiders. These lands are in government forest zone with SPK title deed<sup>4</sup> which means that selling and buying of these land is illegal. The price, however, rose from 3,000 baht a rai to 300,000 baht a rai. As the land becomes more expensive, the government forest land was invaded and sold in the property market.

Rubber tree boom ended 2-3 years ago when latex price dropped lowest in 10 years, people turned their hope to cassava, a higher price crop which does not usually have high market price. Most of the land was used as rubber tree plantation, with the change of demand, there was another shift in

<sup>4</sup>SPK means lands which under Land Reform Office's care according to the Land Reform for Agriculture Act 1975. The majority of the SPK lands came from deteriorated forest lands. The government removed the forest zone land status and handed over to the Land Reform Office so that farmer can utilize this land for agricultural purposes. The farmer would be granted STK 4-01 type of ownership which means the land can be utilized and inherit by the person but cannot be sold.

land use. This came with the attempt to invade into the government forest zone and occupy more land. On the surface, the situation in Ban Dong may be less severe than other part of the country but when look deeply into the situation, the level of severity are the same. Behind the green rubber tree and cassava plants are opportunity, hope, and the effort to increase the yield on one side and the conflict, agitation, violent, ecological degradation, profit speculation and, illegal collaboration on the other side (Tsing, 2005; Barney, 2008; Laungaramsri, 2012). This topic will be addressed in more detail in the next section.

## **Land possession and land-use change**

Literatures on common resources generally view that common resources shared by communities are used with commitment to certain agreements by social groups of similar background (Ramitanondh et al, 1993). However, in Ban Dong, a village established on the edge of the forest with the influence from the economic boom where the people came from different backgrounds to seek opportunities, is totally different from what described in these literatures. The only thing they seem to have in common is the motivations to use the land which are to survive and to improve their lives. Everyone knows well where they can grow their crops and where are the government's forest zone that they have to stay away. However, when the need for land use is increased, some of them chose to intrude into forest zone, some chose to improve the condition of the piece of land that they already own, some chose to seek more land by renting. To understand this process, two parts will be discussed first, the possession of the government forest zone and second, the change of land use outside the forest zone.

It is necessary to give more background about land allocation in our case study. Part of the national forest reserve was re-allocated to land reform area. Another part became wildlife reserve area. This directly affected land use and land ownership for people in the area. This may be thought of as the way the government reinforce its authority over lands and people (Vandergeest and Peluso, 1995). Vandergeest (1996) viewed that a government official map, a technology to increase its power to control the land, shows that Ban Dong is surrounded by 3 types of government controlled lands. SPK area in map 2 which is the area on the left, marked yellow. This area is currently utilized as agricultural land by the majority of the people in Ban Dong. The second type is agricultural land within or on the edge of the wildlife sanctuaries (green area in the map). The third type is agricultural land inside national forest reserve which scattered in small land pieces marked (white areas in the map).

### ***Land Possession in Forest Zones***

The government's authority has been challenged by the villagers as well as many different group of peoples as they possession lands in the government's forest zone. For the readers to see the issue clearer, I would like to mention events which took place in two places in Ban Dong area. The first place is Ban Pa Yang, a village approximately 15 kilometers away from Ban Dong, locates deep into the forest zone (see map 2). From the government point of view, Ban Pa Yang case is a significant and prolonged case of illegal forest zone intrusion. Ban Pa Yang is currently labeled "Kai Dang (egg yolk)" area in the middle of a wildlife sanctuaries. Ban Pa Yang is established by the people who claimed the land and turned it into agricultural land which was about the same time that the government turned the area into a national forest reserve. As the village population increased, the government tried to control land use by, once, move everyone out of the village and allocate agricultural land for them outside of the forest zone. However, the villagers refused to stay where the government wanted them to and moved back into the forest zone. When the demand for latex increased, agricultural land claimed by Ban Pa Yang villagers expanded rapidly. During this time, the authority arrested hundreds of people

with illegal land possession which is both a civil offence as well as a criminal case. However, illegal forest invasion continued until today even though the government increase the areas allocated for agricultural use to 7,500 rai. Furthermore, Ban Pa Yang also serves as a place that helps more people to invade deeper into the forest. Currently, there are several small and large pieces of illegally possessed land scatter in the forest as far as Laos border.

The best motivation that could cause people to defy the law is the power of the market. The higher the latex price is the higher the land price which follow the rule that “the value of the land equals to the profit one can get from the land” (Ganjanapan and Kaosaard, 1995: 120). This is the reason why the land price increased by 50-100 folds, from 3,000 baht per rai to 300,000 baht per rai. Lands in the property market and land price speculation have no limit. The price increases which then increases land possession. Therefore, the question here would be how people can possess forest zone land when the authority is dealing with this issue intensively.

A factor supporting their right to claim the land for the villagers is the tradition. It is traditional for people to possess several pieces of land for different types of agricultural activities such as rice production, crop cultivation and horticulture. Some people claim the land for the future use by their children or to sell for money. Another important characteristic of land possession is the kinship or the patronage systems where the leader or the tyrant would help their people acquire lands and increase their power in a mafia-like manner (Ganjanapan and Kaosaard, 1995: 120). This “illegal power” is essential, as this is border area with national forest reserve, timber concession and communist influence.

Land speculation and the tradition of land use as mentioned before were the primary factor of land possession process in forest reserve. The process has a well-established system with many different approaches. One approach is to expand the current utilized agricultural land, commonly by families that have lived in the area for many generations and quite wealthy or by families who live in the nearby villages and have possessed agricultural land in Ban Pa Yang for some times. These people want to expand their wealth with latex production. This group of people would usually buy the already claimed land from poor villagers. The land expansion process adopted by the villagers is called “every plot expands every year”. This is done by slowly clear small areas around their land or by planting rubber trees between larger forest trees and slowly cut the forest trees one by one. By doing this, the villager assume that the authority would not be able to notice the expansion. In some occasion, they cleared an isolated piece of land deeper into the forest and hoping to acquire the possessory right in the future. The villagers believe that rubber tree plantation would help them acquire the right to legally possess the land easier as the authority encourages people to grow rubber trees and also that rubber trees are perennials.

The second type of invasion is by investors. Investors would pay the villagers or Laos labors to clear the land at night. These investors may be local people or influential person from other areas. The land is then sold to non-local people. During the land-booming period, brokers played an important role in the process. The brokers are both local and non-local people working with high collaboration. There were also government employees involved. It was common that one piece of land was sold to many buyers which often resulted in uncontrollable fights. Successful sells were also common with the buyers acknowledged that the land is illegally possessed. The benefit from selling latex, as the new owner hired local people to harvest latex from the trees and divide the profit, were considered worth the risk even for a short period. The risk is that the land could be confiscated or if they were lucky, they would acquire the STK deed<sup>5</sup> in the future. After a while, when the rubber trees are fully grown

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<sup>5</sup>STK (National Forest Land Allotment Project) emerged from the policy established to stop national forest reserve intrusion by the 1979 government. STK title gives the farmer the right to continue utilizing the land that locates in the national forest zone. It can be handed over to the heirs but cannot be sold. In some areas, including Ban Dong, STK certificate is not provided but there is a list that includes names of farmers in the area who are



and have been harvested for some time, these people would move into the land. This increases the diversity of people currently reside in Ban Pa Yang. These people came from nearby provinces or even from other part of the country. Some of these people became a part of land this illegal land trading process, invading and destroying more and more forest land.

It is interesting also to note that there are several government agencies involve in Ban Pa Yang case. The list agencies who are looking after the area include the royal forestry department, the department of national Parks, wildlife and plant conservation, the border patrol police, the royal Thai rangers and the military's Special Forces. As for why there's still illegal land possession with so many agencies watching over the area, the answer, as suggested many people, is simply that these agencies lack collaboration. It is also suggested that these agencies connive with the land grabbers with high-ranking officials backing them, and other agencies have look the other way or have to get involve and share the profit.

The next location that will be discussed is Ban Dong itself, in the agricultural area on the east of the village (see map 2, the white and eggshell-like color areas on the right hand side of the village). This case is different from what happened at Ban Pa Yang in the way that it is the government's forest land frontier. By understanding what happened here, we will be able to see the flaw in the way government agencies work to protect the forest and another approach the villagers adopted to gain more access to the forest zone. During the increasing demand of latex, things were quite similar to what happened in Ban Pa Yang with land grabbing and land price speculation as a result from the expansion of rubber tree plantations. The process was also carried out by a large network of people including several villagers, local middleman and agencies in other areas. The 2,000 rai agricultural land in Ban Dong, many were sold without any type of deed and there were also many cases of scam. From the survey, half of this land were harvestable rubber tree plantations. Interestingly, part of this land was expanding cassava cultivation areas. Cassava cultivation was found between young rubber trees, rice fields and along brooks. It was found that cassava cultivation was closing in the forest boundary, some of the cassava was just recently planted in the forest zone, and many of the cassava plots seemed to be following the "every plot expands every year" strategy.

The "every plot expands every year" strategy does not go unnoticed by the authority. However, for many reasons, the strategy has proved to be difficult to put charges on. First, the flaw in the policy and the way the authority works. Land survey and permission to use STK areas are responsible by Forest Land Management office. They are skillful at surveying and managing land use in the area. However, they do not have the authority to arrest people who use the land illegally (the office is located at Ubon Ratchathani city). From the interview with a forest land management officer, the forest protection unit has a local office in the area and is directly responsible for putting charges on these people, however, the local office is not skillful at working out the boundaries. Second, the forest protection unit often makes a compromise with the offender to avoid creating tension in the area which had previously resulted in several villagers joined in a protest at the town hall. The officers would say radically "the boundary stake can be moved" or lost "by it selves" . The third reason is government officers can be bought easily. These officers' employment status are temporary employee which gives them the sense of insecurity and also that these officers are actually local people and related to the offenders or that they have to depend on the villagers in some way to be able to live in the area. The villagers also know how to "make friendship" with the officers. They often bribe the officers with food or giving them a helping hand on errand. A villager said that "the officers have to eat just like us, if we give them food they will be on our side". For these reasons, land grabbing can expand deep into the forest.

Land possession in forest zone in Ban Pa Yang and in Ban Dong has proved the power of the

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utilizing the STK land.

property market. The simplification government's strategy to resolve the issue created by the need for lands for cultivate cash crop cannot handle the situation. When there are many involved parties from different social groups, the problem came more complex (Sato, 2000). The severity of the issue was escalated when government officers became part of this illegal process. This can be concluded that the policy and political machinery currently adopted is a malfunction and is ineffective.

### *Change of Land Use Outside Forest Zone*

As mentioned earlier that the villagers adopt different approaches to access land. Some families chose to stay away from the forest zone as they believe the risk is too high. In this section, we will discuss those who occupy SPK lands on the west side of the village (see yellow area on map 2) and STK land on the east (eggshell-like color area on the map). These lands are legally allocated which will be used to demonstrate land use change process. The expansion of cassava cultivation is slowing replacing rubber tree plantations. The total agricultural area in Ban Dong is approximately 5,500 rai, rubber tree plantation occupied approximately 58 percent, 12 percent for rice field and cassava occupied the remaining 30 percent. We can see that rubber tree plantation takes up the majority of the agricultural and as it came first. When cassava arrived, land was already scarce.

Different crop has different effect on the land. For example, cassava should be planted on elevated ground with good drainage. They don't do well in wet soil but instead can thrive in drought condition. They can be harvested in 10-12 months and relatively low maintenance and low starting cost (compare with rubber tree and other fruit trees). However, cassava is land consuming. It requires larger land to make the same profit. Cassava can be sold raw or processed. The price of dried cassava is twice the price of raw cassava. In conclusion, cassava cultivation requires low investment cost and low risk but at the same time giving low returns as well. However, as cassava became more expensive at the same time that latex became cheaper, there's clear change in land use to make the most benefit for the land as follow:

(a) Growing cassava between other plants

This is an intensive use of land. In Ban Dong, this type of land use only occurs in the form of cassava cultivation between free spaces in existing rubber tree plantations without clearing the rubber tree, called "cassavas between rubber trees". This type of agricultural land use can be seen anywhere in Thailand and in other countries (not limited to cassava and rubber tree). This can be done only when rubber trees are younger than 3-4 year-old. Older rubber trees create problem, as these trees have much shade for cassava.

(b) Clearing previously cultivated plants for cassava cultivation

In this area, it was rice that was replaced by cassava. However, rice grows in paddy fields and therefore, not suitable for cassava. However, it would be possible if the rice field is on elevated ground or high ground. The slope can provide good drainage.

High ground rice fields in this area have been slowly replaced by other crops for some times now. Some villages only keep a small rice field to grow rice just enough for home consumption. Some of them stopped growing rice and have to buy them from the market.

In Ban Dong, none of the rubber tree plantations were cleared for cassava cultivation. This is because of the rubber tree plantation's high investment cost. Furthermore, rubber tree plantation is an investment that has long-term profit in which there's still hope for price increase in the future. However, if this is not true then soon, rubber trees will be cut down to make way for cassava as maintenance cost for rubber tree plantation is quite high.

(c) Agricultural land expansion

The expansion of cassava cultivation area in Ban Dong is limited as free land is becoming scarce. However, apart from utilizing small empty spaces between other trees, free spaces on the sides of the

roads, under the power line, on rice paddy dikes or empty plots in the village are used for cassava as well

## Who Controls the Land?

Peluso and Lund (2011) has suggested the concept of land control to explain how one can benefit from a piece of land. An capitalist (or anyone) can benefit from the land without having to actually possess the land. This can be done in many ways. Land control here means control of access. In provide people with opportunity or the ability to utilize the land. This concept is more open than to directly analyze land ownership rights (Ribot and Peluso, 2003). Control of land access is done via several mechanisms, for example, establishing a discourse on the change of land use, adopting new knowledge, market mechanism, or using violent. This idea is very important for the understanding of this chaotic change in Ban Dong. Who control the land or who benefit from the land?

Cassava expansion is directly resulted from bioethanol production by a factory (managed by U company) in Ubon Ratchathani. This factory is currently the country's top bioethanol producer. Cassava is used to produce this bioethanol and therefore the demand for cassava per day increased significantly. The factory had to come up with strategies that would draw farmers to cassava. Most importantly, the market, the buyer had to be able to buy a lot of cassava, then the farmer will produce a lot. They would slightly increase the price. The increase in fuel price resulted in the expansion of cassava cultivation area in the province and the surrounding province.

The author views that the mechanism that drives biofuel production, benefit from agricultural land, is the market (there may be other mechanisms that beyond this study's framework). Cassava is a major cash crop in the global market, however, the price is not set by the value of cassava itself. The price is set by Thai Tapioca Trade Association. The middlemen would then buy at a slightly lower price to compensate with transportation cost to the factory.

Thai cassava market structure clearly lacks of competition. It can be seen that there is only a few buyers and therefore, these buyers can set the price that they want. In this case, the sellers (the farmers) will not have the power to negotiate the price. The buying price relates to the global price but do not relate to the production cost in the local. The price for the processed cassava is however, would always include raw material cost into other costs, in this case the factory will always make a profit from cassava processing. The risk is then on the farmers.

U company is almost monopolizing the buying of cassava with only a few other buyers in the study site. There are only two buyers in the province and U company is the larger with higher production capability. U company has the capability to give the farmer slightly higher price than the other company. The price is good currently as the demand is still higher than the supply. However the risk is when there's an increase in the supply or if U company can import cassava from other places (for example, PDR Laos or Cambodia) at lower price.

If we look at this situation with a larger perspective, the demand for cassava is increasing and therefore, giving Ban Dong villagers more opportunity to sell. However, each villagers do not receive this opportunity equally and this opportunity is showing an undesirable effect on the locals as well. Even though, most villagers want to grow cassava, only 21% grew it last year. High harvest yield depend on the following factors:

(a) Land factor, the farmers must have enough land and on the right spot. A villager suggested that the size should be at least 20-30 rai and must be on high ground. The problem is that most of the land is already occupied by rubber tree plantations. Therefore, unless they go into the forest zone, there is not enough free space. Most of the free space locates in low ground or brook sides which are too wet for cassava. (b) Investment money, to plant, maintain and harvest cassava. Money can help increasing the yield as they rely on buying cassava pieces, fertilizer, herbicide and, labors. These costs

can, however, be reduced by reducing the use of these materials, reusing cassava pieces from the previous year and, reducing labor cost by recruiting family members. (c) Knowledge factor, many farmers learn to cultivate cassava by trying different methods and making mistakes. U company has also provided the knowledge about cultivating cassava. However, many villages don't see the importance of this knowledge as growing cassava is considered very easy for them. They are certain that if they have the right land and enough money, they would be able to successfully cultivate cassava.

For smaller cassava producers like Mrs. Porn with only 14 rai, things can be difficult. She used her savings together a loan to invest in 8 rai of rubber plantation which hasn't give out latex yet when latex price dropped which put her in debt situation. She turned to cassava last year. However, the remaining 6 rai is on the low ground which she realized, not suitable for cassava but she had no choice. The situation worsen by the unusual high precipitation last year which destroyed part of her cassava. For Mr. Sa, he didn't have a rubber tree plantation because he didn't have enough money to invest which turned out good for him. He has 10 rai of rice field which he turned 5 rai into cassava cultivation area. He has enough money as he the remaining 5 rai gave him and his family enough rice that he didn't have to buy from the market. Together with the money sent to him by a family member who was working in the city, he was able to buy fertilizer and herbicide. His yield last year was 4 ton/rai which gave him 5780 baht/rai, which is more than other families.

The case studies that we discussed so far has demonstrated the factors which dictate the incomes by different family. To understand the overall picture, a survey on 30 families was conducted to compare the average efficiency and productivity of the village with the national values (see table 1). The average production cost (include labor costs for family members) is slightly higher than the national value. The average productivity is lower than the national average. The buying prices for both raw and dried cassava are lower than the national value, however, as mentioned earlier, the price is lower by the middlemen to compensate transportation which is how market risk is put on the farmer instead of the middlemen. Net profit per rai in Ban Dong is, however, significantly lower than the national average. The average Ban Dong's net profit per rai is only two-third of the national value. This shows that Ban Dong cassava production is not as efficient as the rest of the country. This increases the risk Ban Dong farmers have to take when the profit is on the middlemen and the biofuel producer.

*Table 1 A comparison between cassava production efficiency and productivity in Ban Dong and national level*

	Ban Dong average	National average*
Production cost (baht/rai)	6,696.42	6,325.61
Production rate (ton/rai)	3.1	3.4
Raw cassava price (baht/kg)	1.92	2.12
Dried cassava price (baht/kg)	5.4	6.7
Net profit (baht/rai)	4,637.07	7,364.88

Source \*national averages are obtained from Agricultural Information Centre as referred to by the national bank, north-eastern Thailand office "Important Agricultural Products Situation in 2013 with 2014 trend"

[http://www.bot.or.th/Thai/EconomicConditions/Thai/Northeast/commodities/Pages/Commodity\\_yearly.aspx](http://www.bot.or.th/Thai/EconomicConditions/Thai/Northeast/commodities/Pages/Commodity_yearly.aspx) accessed on 24/11/56

Another fact that we should consider is that not every household in Ban Dong produce cassava but the expansion of cassava effects every single household. This is because cassava production results in forest zone invasion, reducing biodiversity and increasing the use of herbicide which contaminate the water, the soil and the air. This makes an effect on human health as well. The forest used to be a

place that provide people with free food source. Now, there are less eatable plants in the forest and villagers fear that these plants may be poisoned by the chemical that they use with cassava. Another effect is the increase in land price which reduce the villager's land accessibility. In conclusion, cassava cultivation effects the environment, food security, human health and creating conflict for people in the area. From the interviews with local villagers these effects are significant.

The situation as we discussed show that even though some villagers are benefiting from cassava production, they also have to take a relatively high risk as well. Most of the profit goes to U company where they have created a stable and cheap supply of raw cassava and without having to take responsibility on the environmental and social impacts. In another words, U company pushes this responsibility away from them as "external costs" which becomes the community's responsibility. The final consumers do not also take the responsibility. Even though people involved in social development would considered biofuel to be environmentally beneficial and create jobs for rural people, the fact is the opposite. Biofuel producers are the actual benefiter from the land use change who actually controls the land use.

## **Conclusion and Discussion**

This paper has presented the use and the accessibility of lands in agricultural frontier which is a common issue in northeastern Thailand. The spreading of environmentalism resulted in the government adopting policies for forest protection but new cash crops still emerge and expanding especially those that must be cultivated on the high ground. Agricultural frontiers are found commonly on the boundaries of the government's forest zones. These areas become hotspots for environmental conservative, economic development, and social conflicts.

The topic of "land grab" is now of global concern in academic world. We have more understanding on land deal and the change of land ownership which occur in many forms by many mechanisms and the development that is not a straight line (Borras and Franco, 2014). The expansion of cash crops in agricultural frontier has given us more understanding on this complex process. In this study, we found that the "de facto" controller of the land who actually benefit from the land is the agribusiness that use crops as the raw materials for producing cassava. The farmer is the "de jure" owner of the land who do not actually benefit from the land. This shows that the actual benefiter of the land does not necessary have to own the land especially in the case of developing countries (such as Thailand) (Bernstein, 1981). Another finding in this study is that land grabbing is not a conflict between two parties (the investor and the villager) but there are actors involved as a network of influential people includes local influential person, non-local broker and government official. However, the villagers do not always the losers in this process, many of them actually benefit from land trading. The last finding is as the government manage the land by allocating SPK and STK areas which gives the villagers the right to utilize the land for agricultural purposes but without the right to trade the land. The approach would theoretically keep the lands in the hands of poor people and reduce forest invasion. However, this study found that this approach is ineffective and this is also suggested by other studies (Ganjanapan and Kaosaard, 1995; Onprom, 2014). The trading of the lands and forest invasion still continue illegally. The land cannot be used as a loan guarantee and therefore, less incentive to keep the land when there's an opportunity to sell even for a low price. The policy is therefore ineffective and socially injustice.

The control of agricultural frontier by cash crop expansion mechanisms especially those that are used for biofuel production shows that global economic can be related to local economic via the demand for a product that links to the global product network. At the same time, the discourse of environmentalism, as we can see from forest conservation and followed by the demand for biofuel which is considered to be environmental friendly by the public, drives land grabbing activities which

follows “Green Grabbing” idea (Fairhead et al, 2012). This shows how closely linked the global power is on the local land use problems which impact the way land is utilized in remote areas. The efficiency of land use and the justice in land use in a remote area can also make an impact in the global level.

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