Impact Assessment of Conversion of Land Use Structure to Viet Nam Agricultural and Rural Development

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Abstract

The process of structural change of land use in Vietnam is fast; the proportion of agricultural land decreased markedly, the proportion of non-agricultural land increased. Changing the land use structure impacted on the agricultural and rural development process. In term of economic terms: The positive impact was contributing to the overall economic growth of Vietnam. Besides above positive impacts changing structure made agricultural land square and the average agricultural land square per person decreased (0.0540 hectares per person from 2000 to 2010 was only 0.034 ha / person; incomes' majority of people reduced, investment in agriculture was limited. On the society: positive impact to change the structure of labor and employment; rural infrastructure which was assessed is better. In term of environment: rural environment issues was more concerned, those were the positive expression, but the pollution of some heavy metals in the agricultural land, surface water samples and the overload status of garbage by restructuring land use were the negative expression. This article has analyzed the correlation between the proportion of land to be recovered with group-economic, social and environmental factors showed that X and Y had the same proportion and tight, very tight correlation in the two sub-regions with factors of income per capital; income; career change; rural infrastructure. X and Y had inversely and correlation weakly with investment in agriculture; social institutions in rural areas and rural environment was affected.

Keywords: Land, agricultural, agricultural land, rural development, Vietnam.

1. Problem

Changing land use restructure is considered an important contribution of the global environmental change. Estimating to indicate that the change of humans land had affected 40% of the free freezes surface of the earth, mainly due to the conversion of natural ecosystems to crop land and grass land (Foley and DeFries, 2005). The impacts of the restructuring of land use on ecosystems were larger in the tropics areas, where the conversion of agricultural land occurs primarily on forest lands (Gibbs and RUESCH, 2010). Changing the structure of land use was a result of the interaction from many factors of economic, social, and environmental which occurred at many levels and spatial scales (Lambin, and Geist, 2003).

Changing population, urban rural migration, consumption model, the presence and effectiveness of social organization and land use policies were all examples of local factors can affect the models of structural change of land use (Morton and DeFries 2006), (Lambin and Turner, 2001). Besides, climate change and transformation (example, droughts, tropical storms) were the important factors influencing on the change of land (Grau and Aide, 2008). From a regional perspective, certain geographic areas were easy to be affected by combination of global climate, politics - social and economic factors affecting land changes (Lambin and Geist, 2003), (O'Brien and Leichenko, 2000). For example, four of the ten countries had the highest deforestation rates from 1990 to 2000 (3% or more each year) is the island nation (Haiti, St. Lucia, Micronesia and Comoros), the rate of deforestation related to agricultural expansion (for domestic and international) and infrastructure development (example, roads, ports, housing and tourism) (Wilkie and Eckelmann, 2002), (-UN FAO, 2001).

Besides, extreme weather events can also have a huge impact on the land use restructure. For example, in Samoa, natural forests mostly have been lost or degraded, planted production but plantations are easy to swirl. In the 1990s, and over 90% of planted forest area of the island has lost in a OFA and Val tropical cyclone (Wilkie and Eckelmann, 2002).

These above examples illustrate the importance of analyzing land use restructure in the context of natural factors and human in local and global scale. The purpose of the restructuring of land use is to create a balance between the purposes of land use, different land-use types. To create reasonable land structure, thereby releasing all productive potential, comparative advantages of each region, each area and all the country in order to develop the economy of the local areas towards large commodity production, resolve employments for farmers, improve their income and living standard for farmers in rural areas.

2. Research Methodology

2.1 Method of partitioning and selecting study point

Based on the geographical location, rate of natural land square and the proportion of agricultural land which using purpose change in Vietnam, we classified the study points into 2 sub-region. Sub-region 1: The studying point had high level of land use structural change ; theses points had the proportion of natural land square which was changed the purpose of using was higher than 25% and 50% of the proportion of agricultural land square which transferred to non-agricultural purposes; for example moving to industrial zones, infrastructure, non-agricultural production and business activities . This sub-region's arable land area remained negligible. Those were the new development cities such as Vinh city, Thanh Hoa city, etc.

Sub-region 2: The communes had low conversion level; these communes had proportion of natural land area moved use purpose which was lower than 25% and the proportion of agricultural land was recovered which was lower than 50%. Striking features of these communes were mainly handicrafts and traditional craftsmanship development. There was a high production diversification, the intensive cultivation and cash crops developed strongly; including Buon Me Thuot, Gia Lai, Dong Hoi and some communes which major transformed in agricultural land; including Hue, Dong Ha and Phu Yen. During the surveying process, we saw land acquisition and not acquisition households. Therefore, when we investigated, we divided into two groups to compare between the land acquisition households and households without land acquisition. In which recovered households, the recovered rate was also very different, so the investigation process in the communes continued to divide belongs to agricultural land acquisition households rate to determine influence degree of land acquisition to land acquisition households

Table 1: To choice farmer households' investigation

Criteria	Sub-region 1				Sub-region 1			
	Households group 1	Households group			Households group 1	Households group		
		Households group 2	Households group 3	Households group 4		Households group 2	Households group 3	Households group 4
Questionaire	40	40	40	40	40	40	40	40

(Source: The author studies and synthesis)

Households group 1: Households without land acquisition
Households group 2: Land acquisition households were lower than 30% of the agricultural land area
Households group 3: Land acquisition households were from 30% - 70% of agricultural land area
Households group 4: Land acquisition households were higher than 70% of agricultural land area
Therefore, total of questionnaires were 320. In which 80 questionnaires of households without land acquisition; 240 questionnaires of land acquisition households were at different levels.

2.2. Investigation and interview method

– Investigating and interviewwing farmer household in 2 sub-regions belongs to questionnaire which print collected information such as:
– The investment level in agricultural production in the area
– Earnings, income and livelihood of farmer households
– Employment of land acquisition households and not land acquisition households
– The using status of the compensation of land acquisition farmers household
– Identify the people of infrastructure, economy – social in rural area
- The use of fertilizers and growth stimulants, frequency of using of plant protection products in the agricultural production process in rural households.
- People's opinions about environmental problems occured in the production process at local area.

3. Studying Findings

To determine the impact level of land use structural change to develop agriculture and rural areas, we relied on studying results of people's perceptions and using simple regression model Y = ax + b. Specific results were presented in Table 2.

Table 2. Correlation analysis results between the proportion of agricultural land acquisition in the sub-region with economic, social, environmental factors

Number	Criteria	Sub-region 1		Sub-region 2	
		r_1	The relation level of quantities	r_2	The relation level of quantities
1	Average income per capital	0,80	X, Y tight correlation	0,74	X, Y tight correlation
2	Revenue	0,87	X, Y tight correlation	0,72	X, Y tight correlation
3	Spending level	0,39	X, Y average correlation	0,26	X, Y weak correlation
4	Agriculture investment	0,07	X, Y weak correlation	0,09	X, Y weak correlation
5	Career change	0,89	X, Y tight correlation	0,84	X, Y tight correlation
6					
6.1	Rural electricity supply	0,34	X, Y average correlation	0,19	X, Y weak correlation
6.2	Clean water supply	0,39	X, Y average correlation	0,24	X, Y weak correlation
6.3	Traffic condition	0,87	X, Y tight correlation	0,84	X, Y tight correlation
6.4	School condition	0,91	X, Y very tight correlation	0,90	X, Y tight correlation
6.5	Healthcare condition	0,91	X, Y very tight correlation	0,89	X, Y tight correlation
7	Rural social institutions				
7.1	Social and family relation	0,01	X, Y weak correlation	0,02	X, Y weak correlation
7.2	Security situation	0,01	X, Y weak correlation	0,09	X, Y weak correlation
8	Rural environment	0,06	X, Y weak correlation	0,05	X, Y weak correlation

(Source: Synthesis from the author's survey results)

* The tight and very tight correlation level

The analysis result in Table 2 showed that: The proportion of agricultural land acquisition was in tight average correlation with income per capital, income, career change, traffic condition in the area, school condition, healthcare and r1> r2 means that in sub-regional which had land use structural changing speed with higher speed with speed had tighter correlation compared with sub-region which had lower land use structural changing speed. The equation describes the trend between the proportion of agricultural land acquisition with income per capital in sub-region 1 is Y = 0.772867902*X 1.914278571, in the sub-region 2 is Y = 0.743419638 * X + 1.311803188; with income in the sub-region 1 is Y = 0.972624145*X + 1.565892684 , in the sub-region 2 is Y = 0,715931079*X + 1,698332258; with career change in the sub-region 1 is = 0,97953061*X + 1,436826151, in the sub-region 2 is Y = 0,822291839* X + 1,739058325;with traffic conditions in the sub-region 1 is Y = 1,058533079*X + 1,118816213, in the sub-region 2 is : Y = 0,946804263* X + 1,507785866; with healthcare conditions in the sub-region 1 is Y = 0,961873809*X + 1,431950998, the sub-region 2 is Y = 0,966983015* X + 1,520132682; with school conditions in the sub-region 1 is Y = 1,010156567*X + 1,516078627, in the sub-region 2 is Y = 0,954881907* X + 1,701465033.

X in these equations gets the values of 0, 1; 2; 3. In the two sub-regions X, Y are the same proportion, the Y value in the sub-region 1 is higher than one in the sub-region 2 with the same X value. That means sub-region which has stronger restructuring land use speed, average income per capital level is higher, sources of income are more diversified, career change is more, traffic, healthcare and schools conditions are better than in sub-region which has weak restructuring land use speed.

In the same sub-regional, households group which are more land acquisition are also much better than less land acquisition households group. This is entirely consistent with the above analysis and reality survey results in the area. More land acquisition households force to change career, income also changes belongs to more positive direction with higher demand requirements about quality of all employees. Sources of households income change belongs to positive direction, if previously income concentrates mainly from sources of agricultural production, at the present, income from industrial and handicraft; trade, services and from other sources has also increased significantly. Therefore, the career change is inevitable, the sub-region which has stronger land use restructuring speed, had more career change, more land acquisition households group has higher employment change rate than less land acquisition households group.

Sub-regional which has stronger land use restructuring speed, transport, healthcare and school systems is invested better. This proves that the restructuring of land use had positive effect to contribute to increase income per capital, revenue, career change, to promote rural infrastructure to be better.

* The average and weak correlation levels

The analysis results in Table 2 showed that: The proportion of agricultural land which is revoked has average correlation in the sub-region 1 and weak correlation in sub-region 2 with spending; weak correlation in the two sub-regions with agricultural investment and r1 <r2; the average correlation in the sub-region 1 and weak correlation in the sub-region 2 with the supplying status of electricity and clean water; weak correlation in the two sub-regions with rural social institutions and rural environment.

The equation describes the trend among land loss rate with expenditure in the sub-region 1 is Y = 0,431825995 * X + 2,717459921; in sub-region 2 is Y = 0,256088946 * X + 2,588961577; with agriculture investment in sub-region 1 is Y = - 0,069502172*X + 3,203818869; in sub-region 2 is Y = - 0,102920851 * X + 2,653920575; the electricity supply situation in the sub-region 1 is Y = 0,398543704 * X + 2,610925341; in sub-region 2 is Y = 0,174851807 * X + 2,496636875; the clean water supply situation in the sub-region 1 is Y = 0,43423232*X + 2,695115472; in sub-region 2 is Y = 0,245154949*X + 2,63097761; relationships with family and society in the sub-region 1 is Y = - 0,014656708 * X + 2,590643458; in sub-region 2 is Y = - 0,020270893 * X + 3,156546577; the security situation in the sub-region 1 is Y = 0,009469046 * X + 2,379605613; in sub-region 2 is Y = - 0,078288645 * X + 3,503086704; with the rural environment in the sub-region 1 is Y = - 0,06112691 * X + 2,866308322; in sub-region 2 is Y = - 0,055990663 * X + 3,630885469.

X, Y have the same proportion in the two sub-regions with expenditure level, the electricity and clean water supply. Y in the sub-region 1 gets higher value than the sub-region 2 at the same X value. Therefore, it can be seen that although X, Y have average and weak correlation but in the sub-region which had stronger land use structuring speed conversion rate high land use structure is still a good investment than the speed sub-region restructuring land use low on the supply of electricity, water and higher spending. It can be noticed between the rate of loss of land with an investment in agriculture, rural social institutions and the rural environment has no strict correlation and at the present time restructuring land use has not yet caused much influence these indicators. But in the equation X, Y are inversely so if in the future we are not interested in these issues, the land use restructure could lead to negatively affect investment in agriculture industrial, rural social institutions and rural environment than existing sub-regional phenomenon has affected not good 1 more sub-regions 2 for this indicator.

4. Overall Assessment

The process of restructuring of land use has created many opportunities for the development of agriculture, but it also requires that agricultural production should be very quick, can dynamically adapt promptly demands market. Structural change in agricultural land use is critical for the transformation of rural economy from an agricultural economic structure to the industrial economy, service on rural areas. Create new local jobs and increase income for rural workers. Contribute reassign rural labor, the production capacity of these households fullest, utilizing the labor resources available in rural areas, increase income, improve people's life. This process has spurred producers restructuring of plants and animals and are forced to consider the comparative advantages between production activities on agricultural land is increasingly shrinking. Through land use restructuring conditions for the accumulation of land, to form the production focused area towards commodities, to promote the advantages of each crop type, livestock belongs to production conditions of each region, local and production conditions of each household.

Table 3. Summary of the existence, causes and solutions to the structural change of land use in Vietnam in 2015

Criteria	Status	Cause	Solution
1. Economic		Education level is low, vocational training has not been trained	To train vocation and improve education level for people
	Revenue and Revenue source of a part of people decrease	No capital for organizing production by themselves	To have policy to attract production investment capital
		Restrictions in forming relationships, poor integration capabilities;	To train soft skills for labors
		Employment service assessment capabilities	To enhance employment service assessment capabilities
	Agricultural investment capital are limited	- Low profitability capabilities and many risky	To increase profitability capabilities and restrict risky
2. Social	The shortage of employments of land acquisition labors	People are not prepared to find a new job; low educational qualification	To prepare thought, consciousness and skills training for people themselves to find jobs
		The amount of supporting money for career change are low	
		The vocational training institutions are limited in scope and training quality	To enhance to invest in infrastructure and improve vocational training quality
		Investors are not really interested in the supporting vocational training and job creation commitments	To attract investors' interest in the supporting vocational training and job creation
		The enterprises tend to employ young labors (from 18-35 years old)	To create employments for labors who are over 35 years old
		The employment information channels in the area have not yet really developed	To develop information channels in the area
		Local authorities are not really interested in these problems properly	To need more attention of local authorities
	Rural social institutions are low	The deregulation of Local authorities	The committees, governments, unions need more interested in management problems
		Insufficient awareness about the using purpose of land compensation money and quickly enjoyment psychological	To enhance the discussion about knowledge for the people to use the compensation money effectively
3. Environment	Disorderly garbage, waste water condition	Thoughts not pay attention to environmental protection	To propaganda for people to aware of environmental protection benefits
	Environment pollution	Parks, industrial parks, and production facilities has not really followed strictly environmental protection regulations	To need closely coordination between all authorities levels in discussing the implementation of environmental protection tasks

(Source: Compiled from the actual survey results)

Changing the structure of land use has created favorable conditions brought scientific and technical progress in agriculture. Infrastructure, especially communications system improves, because people early access to markets and new advances of science and technology production. The offer and receipt of technical materials for agricultural production and more favorable.

Besides the positive side, the restructuring of land use also creates difficulties for agricultural production. The influence directly and disadvantages that most land areas reserved for agriculture fell rapidly losing Data type of agricultural production, the scale of production of plant growing increasingly narrow, workers in the age group of 35 to become difficult in finding new employment, problems of environmental pollution and food safety is increasing.

In other types of land use land use planning has not been stable, farmers still produced according to the market trend, chasing immediate profit. The models with high economic efficiency, there are many households with intensive investments that unknown future products will be sold to anyone, where consumer markets ... leading to many products have not sold, prices are lower, less efficient income.

The production level of the people despite being lifted, but produced mostly still done manually, based on the experience of traditional, low productivity, high product costs, uneven quality, difficult to the organization of procurement and processing and competitiveness in the market is weak, the growth rate of the agricultural sector tends to level off. The production process has a closed, relatively safe from epidemics and environmental sanitation. However, the fact that many areas previously converted unplanned, scattered, prone divided territory, affecting agricultural land around ... if just for the self-protection switch play will break environmental landscape, imbalance and impact directly to agricultural producers.

The restructuring of land use within agricultural land is still spontaneous, no specific planning of cultivation areas, production was unsustainable; is transferred from rice to the garden camp site model; This causes negative impacts on agricultural systems and disrupt agricultural landscape and environment. So should do a good job of planning for the transition. In producing farmers also use a variety of crop protection chemicals, growth stimulants, which cause environmental pollution, decrease the quality of products. Enhancing the awareness of environmental protection of the people is limited, waste, waste water, untreated waste and collectors to contaminate the surrounding environment. The type of land use for high economic and society is efficiency but the ability to meet the requirements of capital, labor, scientific and technical qualifications, access to farmers' markets remains limited. Therefore, the restructuring of land use remains to overcome in the development of agriculture and rural areas.

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