



Trends and determinants of compulsory land recovery on households' income in industrialized and urbanized areas: A case study of My Phuoc town - Ben Cat district - Binh Duong province

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ABSTRACT

The main purpose of this article is to examine trends and determinants of compulsory land recovery on households' income in Binh Duong Province through a case study of My Phuoc industrial zone development project. More precisely, it is aimed at investigating the impacts of compulsory land recovery on farm households' livelihood and income strategies both ante- and post-land recovery periods. The qualitative and quantitative analysis methods were applied in this study. The findings figure out that households' livelihoods have been drastically transformed due to compulsory land recovery towards diversifying their income and shifting into non-farm activities. This livelihood adjustment was strongly determined by both ante- and post-land recovered farm households' livelihood assets. More importantly, that the income of post-land recovered farm households has been improved, but unstable and highly vulnerable to external conditions. The determinants of ante- and post-land recovered farm households' income were significantly different. It is firmly concluded that farm households' livelihood transformation due to compulsory land recovery for the industrialization and urbanization process is both adaptive and coping strategies.

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1 INTRODUCTION

Binh Duong is one of leading provinces in Vietnam in terms of the industrialization and urbanization process. This has significantly stimulated local economic development, which has created hundred thousands of jobs to local people and migrant workers. However, thousands of hectares of agricultural land have also lost for urban and industrial development. It also means thousands of farm households losing their farmland which once their livelihoods drawn. They have, therefore, to adopt new livelihood strategies. This study is aimed at

empirically investigating trends and determinants of land-recovered households' livelihood and income strategies in Binh Duong Province through a case study of My Phuoc industrial park development project. Specifically, its purpose is to understand the impacts of compulsory land recovery on farm households' livelihoods, the farmers' development of their new livelihood strategies and the factors determining the farmers' income during both ante- and post-land recovery periods. The data was collected by using on a survey of compulsory land recovered farm households in My Phuoc industrial park, projected area of Binh Duong Prov-

ince. Finally, recommendations are drawn to policy-makers in order to help pursuing more effective and sufficient policies related to land recovery, and sustaining livelihoods of land recovered farm households. The discussion on the field related to compulsory land acquisition and farm households' livelihoods would be made.

2 METHODOLOGY

2.1 Description of the study site

My Phuoc Town, a peri-urban area of Ben Cat District, Binh Duong Province, was selected to be the study site. It is about 20 km from Thu Dau Mot City where My Phuoc Industrial Park (MPIP) is located. Since 2000, this town has experienced a large-scale conversion of agricultural land for industrial and urban development. Prior to the estab-

lishment of MPIP in 2002, My Phuoc Town has a total area of 2,150 hectares where was the living place of 10,000 local people belonged to 2,365 households. A large number of its habitants were farmers, and their livelihoods mainly relied on subsistence agriculture including mainly paddy field, vegetables and rubber plantation. Establishing MPIP in 2002 resulted in a conversion of 1,159 hectares of agricultural land into industrial park and new urban area. There were 838 farm households losing almost their agricultural land on which their livelihoods were made. Consequently, their traditional life and livelihoods were completely changed. Farm households have, then, been no longer practicing agriculture while non-farm based activities have become means of earning their living. Even a number of them have become jobless and relied on their compensation.

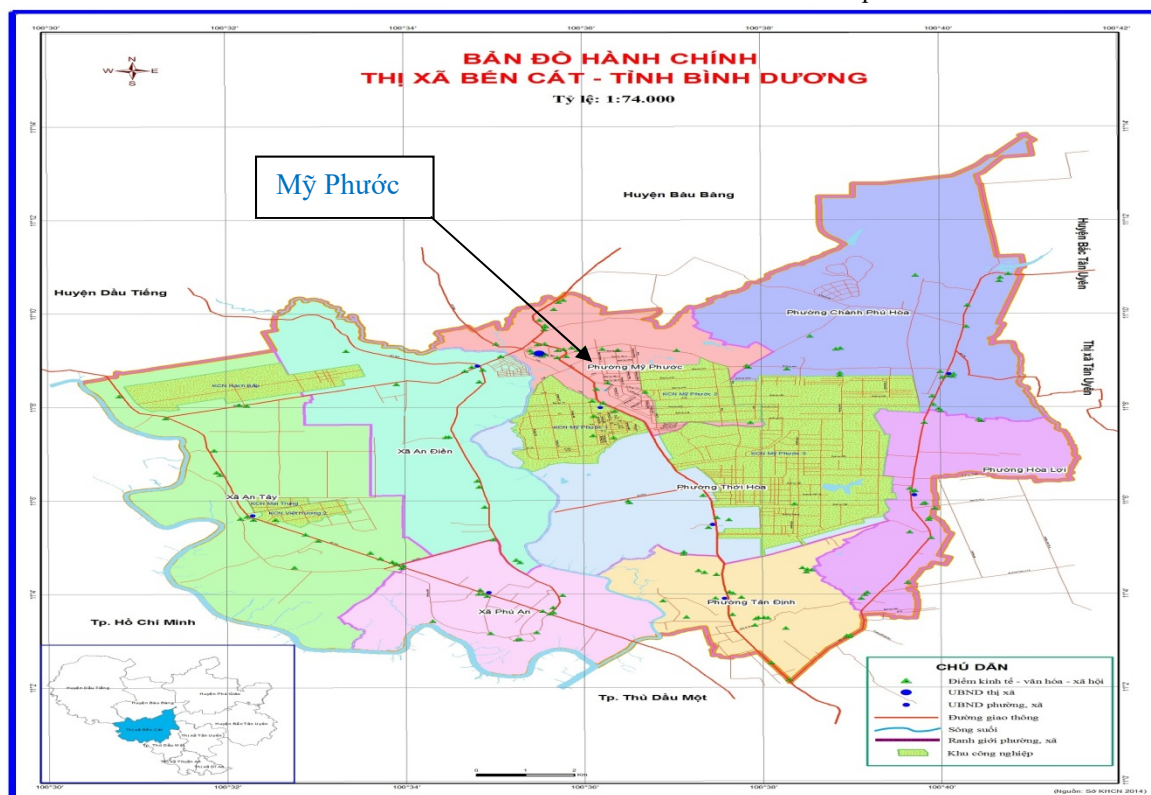


Fig. 1: A geography location map of My Phuoc Town

(Source: <http://www.binhduong.gov.vn/ban-do> -and My Phuoc Industrial Park project, 2010)

2.2 The conceptual framework of the study

This study adapted the sustainable livelihood framework developed by Department for International Development (DFID) (2001) with modifications in order to fit into the study context. Compulsory land acquisition and resettlement due to indus-

trial park and urban development might create both vulnerabilities and opportunities to farmer's livelihoods by influencing their livelihood resources as well as the access to livelihood resources. All these factors jointly determine land-recovered farm household's livelihood strategies and income, finally.

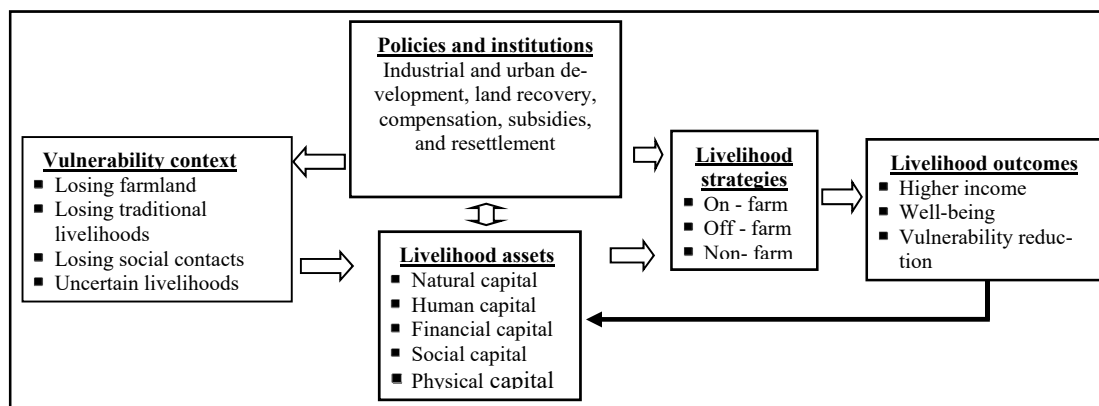


Fig. 2: The analytical framework of the study (adapted from DFID, 2001)

2.3 Data collection and data analysis

The qualitative and quantitative methods were applied through the study in order to investigate trends and determinants of ante- and ex-land recovered household's income.

2.3.1 Data sources and data collection methods

In this study, both qualitative and quantitative data were collected from primary and secondary data sources. Firstly, secondary data, including research monographs, statistics, government's related policies, programs and regulations, MPIP project documents, socio-economic reports were selected from local and central government's agencies, and the MPID project's office. Such data served to provide a general background of local socio-economic conditions and a foundation of empirical survey. Secondly, primary data were collected from the surveys distributed to 86 land recovered farm households. The 86 participants represented 838 farm households based on two features (1) the selected households' income was mainly generated from agriculture, and (2) their agricultural lands were totally or mostly expropriated by MPIP development project. In addition, nine direct interviews were carried out in 2009 and 2010 to acquire data on household's socio-economic conditions and livelihoods in 2001 (ante-land acquisition) and in 2003 and in 2008 (post-land acquisition).

2.3.2 Statistical analysis methods

Main variables for statistical analysis are presented in Table 1.

The present analysis of observed determinants of households' income in 2001 and in 2008 is based on the general linear regression model. In this model, total households' income is defined as the dependent variable, which is supposedly determined by independent variables-proximity of

household livelihood assets. The general model is described as follows:

$$Y_t = f(LA_t)$$

Where, Y_t is total household income in year t , and LA_{tn} is a vector of explanatory factors for household livelihood assets in year t including human capital, natural capital, physical capital, financial capital, social capital (Table 1). Therefore, the general linear regression model used for estimating the influence of household livelihood assets on total household income in 2001 (ante-land acquisition) is rewritten as follows:

$$Y_{01} = f(LA_{01})$$

Y_{01} represents total household income of surveyed households in 2001, and LA_{01} is a vector of explanatory factors for household livelihood assets, which is selected to include into the regression model.

Land recovery, resettlement, new living environment have reformulated households' own livelihood assets and access to livelihood assets. However, livelihood practices are not a discrete process, but rather continuous one. Several ante-land recovery livelihood assets remain to households after resettlement; therefore, total households' income is directly determined by both of ante- and newly accessed-livelihood assets. At the same time, households' investment for livelihood rehabilitation plays an important role on households' income and influenced by both of newly accessed and ante-livelihood assets. Therefore, the simultaneous equation model with a general linear regression form is used to estimate the impact of newly accessed and ante-livelihood assets on households' investment and on households' income. Specifically, the model is written as follows:

$$I_{ex} = f(LA'_{01}, LA_{08})$$

$$Y_{08} = f(LA'_{01}, LA'_{08}, E_{edu}, I_{ex})$$

Where,

- I_{ex} is total households' investment for livelihood rehabilitation after land acquisition;
- Y_{08} is total households' income in 2008;

LA'_{01} , LA'_{08} are vectors of explanatory factors

representing for livelihood assets in 2001 included in the regression model;

- LA_{08} , LA'_{08} are vectors of explanatory factors representing for livelihood assets in 2008 included in the regression model;
- E_{edu} is a proxy variable for total households' expense for education and vocation training after land acquisition.

Table 1: Variable definition

VARIABLE	DEFINITION
Dependent variables	
in_01	Total households' income in 2001 (ante-land acquisition)
in_08	Total households' income in 2008 (ex-land acquisition)
invest_post	Total households' investment for livelihood rehabilitation after land acquisition
Independent variables	
* Proxy variables of human capital:	
hhsz_08	Households' demography in 2008
edu_head	Education of household's head
labour_08	Number of household working members after land acquisition
laedu_08	Average education of working members
* Proxy variables of natural capital:	
farm_01	Total household farmland area in 2001
* Proxy variables of physical capital:	
reland_01	Total household residential land in 2001
reland_08	Total household compensated residential land by project
dismket_01	A distance from home to center market place in 2001
disbstop_08	A distance from home to nearest bus stops in 2008
nmobile_08	A total number of mobile phone in household in 2008
* Proxy variables of financial capital:	
savlivstk_01	Total value of household's livestock plus saving in 2001
saving_01	Total value of household's saving in 2001
credit_01	Total value of household's debt (credit) in 2001
wage_01	Total value of household's earned wage in 2001
saving_08	Total value of household's saving in 2008
cashcom_08	Total household's compensated cash by project
credit_08	Total value of household's debt (credit) in 2008
* Proxy variables of social capital:	
frdly_01	Household's friendly level with neighbors in 2001
frdly_08	Household's friendly level with neighbors in 2008
socim_08	Social organization membership of household in 2008
* Other proxy variables:	
relandtra_08	A number of compensated land transfers
farm_re	Total area of household's recovered farmland
expenede_08	Total household's expense for education after land acquisition

The ordinary least squares estimation of individual equations in the simultaneous equation model can lead to biased and inconsistent parameter estimators because the endogenous explanatory variables are dependent variables from other equations in the system. Therefore, a three-stage estimation procedure is applied for testing the above simultaneous equation model and this estimation method can

resolve the problem caused by the ordinary least squares estimation. (Pindyck and Rubinfeld, 1991: 228, cited in Vien, 2007).

3 RESULTS AND DISCUSSION

3.1 Trends in households' livelihood strategies

Ante-land recovered farm households in the projected area were popularly undertaking one or a

combination of two livelihood activities at the same time such as just crop cultivation or combining with livestock raising, or waged-labour in manufactories or on farms, etc. However, their income was largely generated from farming while

income from livestock raising, wages and small retail business was a supplementary source. Though such livelihood strategies had not brought farm households much cash income, their livelihoods and food security were ensured.

Table 2: Number of livelihood activities per household in 2001, 2003 and 2008

No.	Number of activities/HH	2001		2003		2008	
		HHs	%	HHs	%	HHs	%
1	One	25	29.07	25	29.07	7	8.14
2	Two	59	68.60	30	34.88	29	33.72
3	Three	0	0	21	24.42	27	31.40
4	Four	0	0	8	9.30	18	20.93
5	Five	2	2.33	2	2.33	5	5.81
Total		86	100	86	100	86	100

(Source: Household survey, 2008-2009)

Due to the launch of MPIP in 2002, land-recovered households tended to adapt more diverse livelihood strategies by combining, at the same time, three or four livelihood activities, especially 5 sampled households undertook five activities in 2008. This finding is radically consistent with a pull and push theory of livelihood diversification. On the one hand, households' livelihood activities were redeveloped due to loss of farmland, loss of traditional skills of livelihood making in the context of land recovery and resettlement, and lack of knowledge and skills in non-farm economic sectors. On the other hand, they could be able to access to new job opportunities provided by newly established factories, services and supports from government for land-recovered farmers as well as their available compensated cash for investing in new livelihood activities. These factors have jointly pulled and pushed farmers simultaneously to diversify their livelihoods for living security and well-being improvement.

Explicitly, Table 3 shows that in 2001 every farm household practiced some of 18 livelihood activities in which farming, livestock raising, and factory hired-labour were the most common. There were 82.56%, 46.51% and 23.26% of households engaged in farming, livestock raising, and factory hired-labour, respectively. Thus, before land recovery, this town was agriculture-dominated area, and farming was a major source of generating income and supplying food to farmer households. Farmers cultivated rice and vegetables in paddy fields principally for household's food demand and the remains for market. Rubber and thick bamboo

were grown in garden and non-paddy field land which created farmers' major cash income. Among livelihood activities, livestock (poultry and pig) and cattle (buffalo and ox) raising was ranked the second in terms of number of household engaged. At the same time, in order to allocate effectively households' abundant labour and relax their farmland and cash income constraints, farmers sought their income by engaging in waged labour in industries, services and even in the agricultural sector.

After land recovery and resettlement, household livelihoods were significantly changed in terms of both income sources and proportions of households engaging in each livelihood activity. Number of income sources were increasing from 18 sources in 2001 up to 21 sources in 2003 and 23 sources in 2008. Land recovery and resettlement lead households to redevelop their livelihood resources and new income making conditions that have become both pull and push forces of households' livelihood diversification. Livelihood diversification has caused decreasing contribution of income from farming, livestock and cattle raising to households' total income. There were only 6.98% and 8.14% of households engaging in farming and 2.33% and 4.65% of household raising livestock and cattle in 2003 and 2008, respectively. Such households used their compensated cash to buy land in nearby communes for planting rubber tree or keeping their farming practice the projected area. Several others continued raising cattle by taking advantage of a large area of resettled land being unused. A rate of households with members engaged in farm-waged labour was suddenly reduced due to land conversion.

Table 3: Trends in ante- and post-land recovered households' livelihood activities

No.	Activities in 2001	% of HHs	No.	Activities in 2003	% of HHs	No.	Activities in 2008	% of HHs
1	Farming	82.56	1	Farming	6.98	1	Farming	8.14
2	Livestock	46.51	2	Livestock	2.33	2	Livestock	4.65
3	Non-farm hired labour	23.26	3	Non-farm hired labour	34.88	3	Non-farm hired labour	33.72
4	Farm hired labour	17.44	4	Farm hired labour	3.49	4	Farm hired labour	3.49
5	Construction service	6.98	5	Construction service	17.44	5	Construction service	9.30
6	Education	6.98	6	Education	6.98	6	Education	5.81
7	Tailoring service	5.81	7	Tailoring service	2.33	7	Tailoring service	3.49
8	Government service	4.65	8	Government service	4.65	8	Government service	9.30
9	Transportation service	3.49	9	Transportation service	5.81	9	Transportation service	11.63
10	Retail business	3.49	10	Retail business	17.44	10	Retail business	20.93
11	Animal clinic	2.33	11			11		
12	Hair salons	2.33	12	Hair salons	1.16	12	Hair salons	2.33
13	Employment in wedding service	1.16	13	Employment in wedding service	1.16	13	Employment in wedding service	1.16
14	Motorbike repairment	1.16	14	Motorbike repairment	2.33	14	Motorbike repairment	6.98
15	Safeguard service	1.16	15	Safeguard service	2.33	15	Safeguard service	5.81
16	Construction furniture service	1.16	16	Construction furniture service	1.16	16	Construction furniture service	3.49
17	Vehicle leasing	1.16	17	Vehicle leasing	3.49	17	Vehicle leasing	3.49
18	Carpentry	1.16	18	Carpentry	2.33	18	Carpentry	3.49
19			19	Real estate brokerage	2.33	19	Real estate brokerage	3.49
20			20	House renting	1.16	20	House renting	43.02
21			21	Village leadership	1.16	21	Village leadership	1.16
22			22			22	Billiards club	1.16
23			23			23	Internet service	1.16

*Note: HH = Household (Source: Household survey, 2008-2009)

In contrast, diversifying in non-farm livelihood activities has become a popular practice among land-recovered households. house renting to immigrant workers, running small business, working in manufactories became their dominant livelihood activities. In addition, households reallocated their abundant labour and other resources in supplementary livelihood activities such as constructive service, motorbike reparation service, safeguard service, taxi service, real estate brokerage, carpentry, hair salons, internet service or some highly invested activities such as vehicle renting service or construction service. However, post-land recovered households' livelihood strategies were very much contingent on their resource availability, capacity and economic conditions. Thus, it can be asserted that a large proportion of households sought their income from combining less invested and unskilled activities such as manufactories' workers, small retail business, and self-employed jobs (Table 3). Such households were normally fallen into a group of farmers having small landholding and practiced purely agriculture before land acquisition. Special

attention should be paid to the fact that 29.07% of post-land acquisition households were not engaged in any livelihood activities, and their living totally relied on their compensated cash from land acquisition. Elder and poor farmers belonged to this group. They were hard to undertake alternative livelihoods such as small retail business, jobs in manufactories or hard jobs like construction workers due to lack of manpower or low education and poor working skills. Households with well-trained labours or plenty of financial capital tended to engage in skillful labour-required jobs or highly invested activities such as office works, building houses for rent, vehicles for rent, construction entrepreneur, etc.

In addition, the household survey and key informant interviews further show that post-land acquisition household's living standard though tended to be gradually improved. Livelihoods of many households seemed to be vulnerable due to insecurity and unsustainability because their businesses were deeply depended on external situation, e.g. daily paid works, small retail businesses or self-

employed services. Even, those running highly invested businesses such as houses for rent also faced with serious risk since house renters, commonly workers, who were often paying their rent late or suddenly quitting their rent contract without payment. As traditional farmers, resettled farmers lack knowledge and skills in new businesses such as vehicles for rent, construction entrepreneur, therefore, engaging in these businesses brought difficulties and risks to households.

3.2 Determinants of ante- and post-land acquisition households' income

The results of the model estimates indicate that determinants of ante- and ex-land recovery households' income were different. The income of ante-land acquisition household was determined by several households' livelihood assets in 2001 such as households' landholding (including the area of farmland and residential land), savings, social capital (proxy by a strong level of neighbor relations), market access (proxy by a distance from residence to center market), and hired-labour wages. Statistically, the area of farm and residential land, saving,

social capital and hired-labour wages were found to be positive factors, significantly affecting ante-land recovery households' income (significant at a 1% level). The statistical estimates are very consistent with the previous investigation. Thus, ante-land recovery households' income generated fundamentally from households' farming activities and supplemented by livestock raising and non-farm and farm-waged labour. The evidence is that 82.56% of households participated in agriculture, and, at the same time, 40.90% of households engaged in non-farm and off-farm waged labour, which contributed a significant share of their income. It should also take into account that a variable representing households' market access (distance from residence to local markets) is negatively correlated households' income (significant at a 1% level) (Table 4). It means that living far away markets would cause farmers difficulties in access to both markets of inputs and outputs that resulted in losing their income from added value from agriculture as well as access to other income making opportunities.

Table 4: The result of econometric regression (*) on determinants of households' income in 2001

inc_bp	Coef.	Std. Err.	Value t	Value P> t	[95% Conf. Interval]	
farm_01	.0004642	.0002023	2.29	0.024	.0000615	.0008669
reland_01	.0926732	.0417829	2.22	0.029	.0095065	.17584
saving_01	.3708151	.0964417	3.84	0.000	.1788527	.5627776
dismket_01	-4.34155	2.197404	-1.98	0.052	-8.715373	.0322736
frdly_01	71.35825	36.69903	1.94	0.055	-1.689342	144.4059
wage_01	1.255867	.3148518	3.99	0.000	.6291699	1.882564
cons.	-279.8429	147.1864	-1.90	0.061	-572.8101	13.12438

Number of obs = 86

Prob > F = 0.0000

R-squared = 0.4250

Adj R-squared = 0.3814

summarize in_01 farm_01 reland_01 saving01 dismket_01 frdly_01 wage_01

Variable	Obs	Mean	Std. Dev.	Min	Max
in_01	86	31.79163	35.61153	2.4	237.53
farm_01	86	15928.72	15850.95	0	79000
reland_01	86	278.6047	77.47733	0	500
saving_01	86	14.09302	33.70691	0	175
dismket_01	86	4.57093	1.441149	1.5	8
frdly_01	86	3.988372	.1078328	3	4
wage_01	86	6.717674	12.2019	0	72

(*) Note: regression function: $in_01 = f(farm_01, reland_01, saving01, dismket_01, frdly_01, wage_01)$

(Source: Econometric regression based on household survey data in 2008-2009)

Due to land recovery and resettlement in a new living environment, households' livelihood resources have been redefined. In turn, changes in households' livelihood resources would eventually force farmers to adopt new livelihood strategies that influenced their income. The results of three-

stage least squares regression shows that area of resettled residence land, resettled residence land transfer, post-land appropriation saving and credit access, and household size have positive influence on households' investment (statistically significant at 1% - 10% levels). It reveals that cash from land-

recovered compensation, transfer of compensated residence land and access to favorable credits provided by project, and government's supportive credit institutions are a main source of capital that households invested in making their new livelihood strategies. In contrast, total area of recovered farmland, education of households' working members,

and ante-land recovery credit have negative impacts on households' investment (statistically significant at 1% - 5% levels). Noticeably, credit that households had accessed before land recovery would become debt. Therefore, the debt has also negative impact on household investment after land recovery and resettlement.

Table 5: The result of econometric regression ^() on determinants of households' income in 2008**

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	p
in_08	86	9	15.68956	0.8804	635.44	0.0000
invest_ex	86	9	289.8923	0.8335	431.09	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. interval]	
invest_ex						
reland_08	.3075964	.0803886	3.83	0.000	.1500376	.02651552
relandtra_08	115.6409	45.63745	2.53	0.011	26.19315	205.0887
saving_08	.6381422	.2844189	2.24	0.025	.0806914	1.195593
farm_re	-.0146541	.0044504	-3.29	0.001	-.0233766	-.0059315
cashcom_08	.4929982	.1913215	2.58	0.010	.1180149	.8679814
credit_08	6.255817	.3241452	19.30	0.000	5.620504	6.89113
laedu_08	-18.65886	7.880138	-2.37	0.018	-34.10364	-3.214071
credit_01	-	1.749616	-2.34	0.019	-7.530997	-.6726276
	4.101812					
hhszize_08	33.01442	20.29621	1.63	0.104	-6.765416	72.79426
_cons	-167.908	94.92272	-1.77	0.077	-353.9531	18.13709
in_08						
edu_head	1.028339	.472094	2.18	0.029	.1030513	1.953626
expenedu_08	.0673238	.0305932	2.20	0.028	.0073621	.1272854
disbstop_08	-21.60322	6.462065	-3.34	0.001	-34.26863	-8.937803
nmobile_08	5.19096	1.518251	3.42	0.001	2.215241	8.166678
socim_08	1.899382	.1767125	10.75	0.000	1.553032	2.245732
labour_08	6.915721	1.636733	4.23	0.000	3.707782	10.12366
frdly_08	-11.81816	3.709509	-3.19	0.001	-19.08867	-4.547657
savlivstk_01	.1194588	.0471635	2.53	0.011	.0270201	0.2118975
invest_post	.0177131	.0080394	2.20	0.028	.0019562	0.3347
_cons	40.56031	11.91725	3.40	0.001	17.20293	63.91769

Endogenous variables : invest_post in_08

Exogenous variables: edu_head expenedu_08 disbstop_08 nmobile_08 socim_08 labour_08

frdly_08 savlivstk_01 invest_08 reland_08 relandtran_08 saving_08 farm_re cashcom_08 credit_08 laedu_08 credit_01 hhszize_08

(**)Note:

invest_post = f(reland_08 relandtran_08 saving_08 farm_re cashcom_08 credit_08 laedu_08 credit_01 hhszize_08)

in_09 = f(educ_head expenedu_08 disbstop_08 nmobile_08 socim_08 labour_08

frdly_08 savlivstk_01 invest_01)

(Source: Econometric regression based on household survey's data in 2008-2009)

The results from three-stage least-square regression suggests that investment has resulted in increasing households' income positive correlation at statistically significant at a 5% level. In addition, education of household head, household members' training investment, number of household working-aged members, ante-land expropriation livestock

heads and saving are also positively influencing on households' income (statistically significant at 1% - 5% levels) (Table 5). This might be concluded that education, saving and labour force played significant role in households' income after land expropriation and resettlement. It should be taken into special attention that living in the new residence had caused resettled households losing their

own strong social capital that directly influences their traditional livelihoods, and is benefited from their reciprocity in production. Living in the new resettled areas far away from markets and transportation system has negative impact on households' income, i.e. difficulty in access to service-based livelihood activities, loss of income-earned opportunities.

4 CONCLUSIONS

Compulsory land expropriation for industrial and urban development forced farm households to change completely their livelihoods from agriculture to non-agriculture-based livelihoods and to diversify their non-farm activities. It is important that due to low education and lack of professionally trained skills of labours, farmer households were bounded them to access and diversify their non-farm activities in low-paid and less professionally required sectors. Therefore, their income has been improved, but unstable and highly vulnerable to external conditions. The firm conclusion is drawn that farm households' livelihood transformation due to compulsory land recovery for the industrialization and urbanization process is both adaptive and coping process.

The determinants of income activities of ante- and post-land recovered farm households were significantly differentiated. This revealed livelihood resources and their changes due to land recovery and resettlement significantly determined households' livelihood strategies and outcomes. Newly developed livelihood activities were heavily relied on accessed livelihood resources and labour force, education attainment, vocational training, area of compensated residential land, a volume of compensated cash, situation of business and factories located in the MPIP. Therefore, development programs should be paid special attention to strengthen households' adaptive capacities and production resources both ante- and post-land recovery.

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