

ORIGINAL ARTICLE

The effect of forestland allocation to the livelihoods of local people in the North Central Coast of Vietnam: A case in Nam Dong district

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ABSTRACT Forestland allocation (FLA) policy in Vietnam aimed at conserving forests and improving local livelihoods. In regard to the effectiveness of FLA, some authors reported improvements in forest cover and quality, whereas others stated inappropriate implementation process and minor impacts on household income. Hence, this study examined whether disturbances in initial stage still existed, how allocated forestlands were utilized, and how FLA contributed to local livelihoods under different forest management regimes. D village of Nam Dong district, where FLA was introduced in 1995, was selected as a case, and 78 households were randomly selected for household interviews. The results revealed that shifting cultivation, once widely reported in mountainous regions, had already ceased before our survey. Natural forests allocated to groups were mainly utilized for non-wood forest product (NWFP) collection, regardless of whether those users had an allocation. Individually allocated areas were converted to acacia and recently to rubber plantations. The rotation of acacia plantation was five to seven years with intercropping cassava in the initial stage. FLA contributed to adjusting an uneven distribution of farmland and income, but the effect remained nominal. The role of FLA in income generation was limited due to small allocation area per household (1.50 ha on average). Switching to rubber trend was another reason of limited income derived from FLA. Therefore NWFP played a more significant role in the household economy than plantation yields. Investment in livestock was first preference of respondents, which suggests the importance of small-scale livestock rearing in the areas facing land shortage.

Key words: private forestry, acacia plantation, NWFP, Thua Thien Hue, Co Tu

INTRODUCTION

Most of the abundant natural forests in humid South-east Asia were once set aside in state ownership, but a growing market for roundwood after the 1960 s prompted governments to dispose of natural stands to logging companies. Even though the extraction methods were designed to ensure sustainability like the selective cutting systems used in Malaysia and Indonesia (Thang 1987, Kartawinata et al. 2001), lack of governance often triggered forest degradation and conflicts between the government or logging companies and local people. As an alternative to government failure in natural forest management, the necessity for people's involvement in decision-making and establishing local-level collective management has been emphasized and widely practiced (FAO 2011).

Conversion of already degraded natural forests to more profitable tree plantations is another indirect solution, in principle, to save remaining natural forest ecosystems (FAO

2006). Van Kooten and Vertinsky (1998) estimated that less than one third of wood harvested for industrial purposes originated in undisturbed natural forests, and Harrison and Herbohn (2001) put an emphasis on government roles to develop farm forestry in the tropics. The kinds of policy that can support and promote this option should be paid more attention, but optimum property and management regimes for each forest type and forest function, which often form a prerequisite, do not explicitly appear in the arguments over regimes. Though Gibson et al. (2000) recognized that it is sensible to lump tree crop monoculture in with agricultural farms, they yet supported the applicability of public property regime even in plantation forests. Even though various studies on the degree and effectiveness of devolution have been conducted (Sikor and Tran 2007, Sikor and Nguyen 2007, Ngo and Webb 2007) whether devolution policies successfully lead to conversion of degraded forests to tree plantations still remains unclear.

Vietnam is one of the few forest gain developing coun-

tries according to FAO (2010), and therefore has attracted researchers particularly in the field of forest transition theory (Mather 2007, Barbier et al. 2010). As the increase in forest cover appears to follow the drastic change in land and forest policy, which is known as forestland allocation (FLA) policy, previous studies have attempted to specify the explanatory variables of the forest cover change before and after FLA. On the other hand, ethnic minorities have historically domiciled in forested mountainous regions of Vietnam, and it is widely reported that they collectively utilized surrounding natural forests for extraction of products and also forestland for farming (Bien 2001, Sunderlin and Huynh 2005, Castella et al. 2006, Tran and Sikor 2006, Sikor and Tran 2007, Thang et al. 2013). Therefore, interactions between newly introduced *de jure* FLA and *de facto* people-forest nexus became another concern of the previous studies.

In brief, the government of Vietnam has shifted its land policy from collectivization to decollectivization since the 1980 s (Akram-Lodhi 2007). Liberalization in land tenure was strengthened by the 1993 Land Law, which allowed 50-year contract for lands with perennial crops. The land-related rights enhanced by the 2003 Land Law were: rights to exchange, transfer, ease, inherit, mortgage, re-rent, grant, use a land use right as collateral, use a land use right with others to generate capital, and be compensated at the market price if the land is repossessed by the government.

Forest administration has moved in step with this land reform. The 1991 Forest Protection and Development Law categorized forests into production forests, protection forests, and special purpose forests that comprise national parks and other protected areas with specific ecosystems and landscapes. Of these three categories, production forests were subject to the 50-year contract for lands with perennial crops.

According to the 2004 Forest Protection and Development Law, special use forests, which were supposedly least degraded, can be allocated to special use forest management boards and other organizations for research, education, and training purposes. Protection forests are allocated to protective forest management boards, economic organizations, Vietnam People's Armed Force (VPAF) units, communities, and households and individuals living therein for management, protection, and development of the allocated forests. Production forests, which actually confronted deterioration caused by the overexploitation and the shifting cultivation as mentioned later, are allocated to households and individuals living therein, economic organizations for seedling production, VFAP units for use in combination with defense and security tasks, and protective forest management boards

in cases where production forests are intermingled with protection forests already assigned to them (Fig. 1).

Taking land-related rights created by the 1993 and 2003 Land Law, the FLA policy advanced in Vietnam can be regarded as a combination of collectivization and decollectivization, or in other words, a combination of common property regimes and private property regimes: the former is directed toward natural forest management mainly for protection while the latter is for tree plantation management and for production purposes. The FLA policy was inevitably linked to afforestation programs (Program 327, 556, and 661) to help households to convert allocated, an often barren, forestland to timber plantations.

In regard to the forest cover change during the 1990's, a spatially specific study on a commune in the Northwest Region suggested that forest cover increase took place even before the introduction of FLA (Sikor 2001). A descriptive study on two pilot project sites of FLA in the Northeast Region and North Central Coast Region concluded the allocation did not halt forest degradation (Gomiero et al. 2000). After this negative evaluation on the FLA policy, Meyfroidt and Lambin (2008) detected an increase in tree plantations in the Northern Vietnam. However, a decrease in natural forests in the Southern areas was also observed, which led to a conclusion that the role of plantations to relieve pressure on natural forests could not be supported. Clement et al. (2009) compared the land cover of a province in the Northeast Region from 1993 to 2000, and revealed that the official forest-cover statistics were likely overestimated and FLA had none or no positive impacts on the increase.

In contrast, a village-level study in the North Central Coast Region detected a population-driven increase in the area of shifting cultivation through the 1990 s; then the area reversed to a rapid decrease from the end of the 1990 s; and

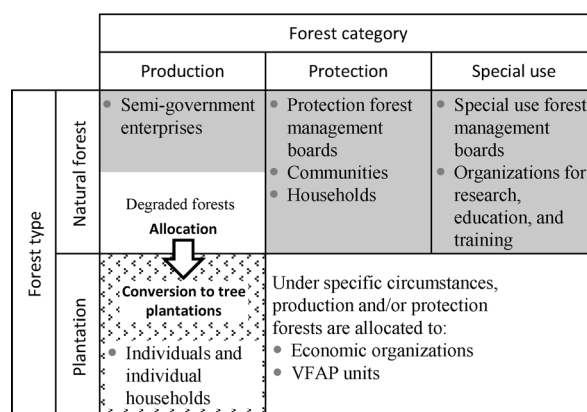


Fig. 1. Forest functions, forest types, and forest management entities.

FLA was most likely a cause to this change (Jakobsen et al. 2007). Thiha et al. (2007) compared forest cover change in 1975, late 1990 s, and early 2000 s in Nam Dong district, Thua Thien Hue Province and identified that not only a continuous forest degradation but also an expansion of tree plantations occurred especially during the early 2000 s.

Though the FLA policy expects that livelihood improvement through the allocation creates incentives among local people to protect allocated forests (Castella et al. 2006), household surveys reported negative impacts mainly caused by an ineffective implementation process and non-compliance among the local people. In two pilot project sites in the Central Highland Region in the early 2000 s, the forest cover decreased after FLA because people rushed to the surrounding forest to clear land for farming (Sikor and Tran 2007); and close ties between the local authority and village people hampered the monitoring of recipients' obligation to protect the allocated forests, resulting in a connivance of cultivation inside allocated forests (Sikor and Nguyen 2007). Reckless allocation and frequent transfer of allocated land mainly for farming purposes were also reported in a village on the North Central Coast (Nguyen and Sato 2008). One of the latest studies in Nam Dong district criticized that local people's forest use and forest dependency were reduced, even though property rights were enhanced (Thang et al. 2010).

It should be noted that most of these studies were conducted shortly after the implementation of FLA. As shown in Fig. 1, however, current FLA consists of a complicated combination of different forest functions, forest types, and forest management entities. It is necessary to define under which combination of forest function, property regime, and management entity the disturbance or poor implementation occurs. Thus this study aims to determine whether disturbances in the initial stages as in previous studies, which revealed difficulties particularly in the areas where shifting cultivation was still dominant, have been settled, how the allocated forestlands were utilized, and how FLA contributed to local livelihoods, with reference to the differences in forest management regimes.

MATERIALS AND METHODS

Study site

Nam Dong district is one of the two mountainous districts in Thua Thien Hue province. We selected this district because previous studies in the same district focusing on FLA can be used as references. Of 11 communes in the dis-

trict, TL commune located on the plateau was one of the pilot communes of the FLA, and therefore was expected to have considerable experience in allocated forest management compared to the other communes. Another reason for the selection of TL commune was that Co Tu (CƠ TU in Vietnamese) people, one of the two main ethnic minorities in Central Vietnam, dominate the population. The majority of the other communes in Nam Dong district comprise Kinh people, who mostly dominate the coastal lowlands, accounting for approximately 86 % of the national population (UNFPA 2011). The total population of TL commune was 1,201 people (262 households) in 2010, in which Co Tu people accounted for 93.7 % of the total population (Nam Dong District 2011).

Co Tu people were originally shifting cultivators, but became involved in the resettlement program initiated by the government after 1968 (Thang et al. 2010). In particular, after the ban on shifting cultivation in 1997, they settled in the allocated areas and engaged in wet paddy cultivation and horticulture. However, shortage of lowland areas made Nam Dong to be one of the poorest districts in Vietnam, and the Co Tu people's livelihoods became dependent on forest products (ibid, Wetterwald et al. 2004).

TL commune is located along Ta Trach River which is backed by hills (Fig. 2). Of the three villages along the river, we selected D village for the case study. According to officials of TL commune, D village shares similar geographical settings, historical background, and ethnicity with the other two villages.

Primary data collection and analysis

After preliminary interviews to key informants, 78 households (58.6 %) were randomly selected from the total of 133 households listed and previously ranked to Wealthy, Average, and Poor groups by the village office (Table 1). Respondents of 78 households were 40 husbands and 38 wives. The indicators applied by the commune to rank the wealth of village households were: fixed income sources including pension, agricultural assets including livestock, forestland area, and housing conditions. Household interviews were conducted in July-September 2011 using a structured questionnaire, together with open-ended interviews to district-level offices of the Department of Agriculture and Rural Development (DARD), Department of Natural Resource and Environment (DONRE), and the Forest Protection Unit (FPU).

Annual income refers to the period from August 2010 to July 2011. To make a comparison between agricultural

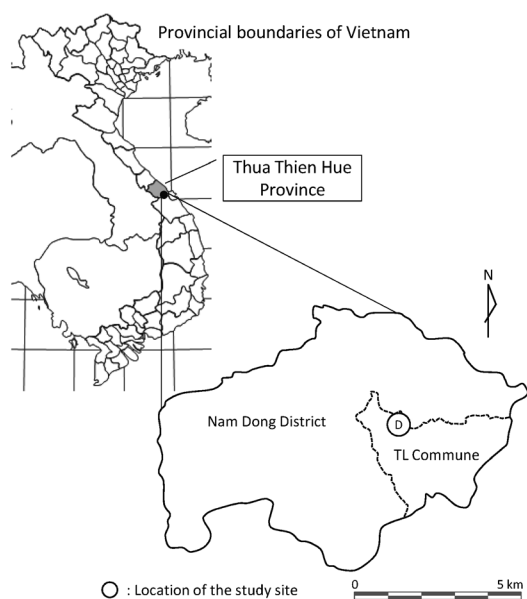


Fig. 2. Location of D village.

Table 1. Number of sample households by wealth rank

Wealth rank	Total HHs	Sample HHs	
		Number	(%)
Wealthy	14	8	(57.14)
Average	56	34	(60.71)
Poor	63	36	(57.14)
Total	133	78	(58.65)

and non-agricultural cash incomes, we applied the annual harvest amount multiplied with the average farm-gate price and deducted cash input for the agricultural income. While income from non-wood forest products (NWFPs) simply shows the sales during the above-mentioned study period, income from tree plantations reflects the Net Present Value (NPV) of the total harvest with a deduction of cash input for the past five years, which is the commonly applied rotation for *Acacia* spp. The reason why we applied NPV is due to few households achieving a sale of wood during the study period. We adjusted allocated forestland area equal to sixth part of farmland, taking the rotation period of fast growing species, to calculate the Gini coefficient of the total land area managed by sample households. To calculate the Gini coefficient of income, we applied a secondary source on the economic performance of *Acacia* plantation apart from actual harvest data. According to Ho and Nguyen (2011), gross return of *Acacia* per ha was 21,000 VND, while total cost was 4,120 VND (20,000VND = 1 USD).

We used MS Excel 2013 for the statistical analysis.

RESULTS

FLA and forest cover change in Nam Dong district

FLA was first implemented in Thua Thien Hue province in 1995 through the project of VIE/020/ITA funded by FAO. The next period of allocation in the province was 2000–2004, which began with the financial support of the Netherland Development Organization.

In Vietnam, State Forest Enterprises (SFEs) organized under the DARD of each province comprehensively managed forests except protected areas, but actual situation was production-oriented management regardless of sustainability of the resources. In 1999, the government decided to transform SFEs to Watershed Managements Boards or Forestry Business Companies. The jurisdictions of the SFEs were reclassified to protection forest and production forest, and the areas beyond the SFEs' management capacity were allocated to the applicants. In the case of individual allocation, each applicant had to register at the commune office and get approval (Ngo and Webb 2007). The SFEs in Thua Thien Hue province stood on the verge of accelerated FLA supported by the 2003 Land Law and the 2004 Law on Forest Protection and Development, and accelerated their investment for infrastructure. The road infrastructure attracted local people and allowed them to take advantage. As a result, the severely degraded forest area in Nam Dong district jumped to 874 ha year⁻¹ in 2001–2004, compared to 45 ha year⁻¹ during the period of 1989–2001 (Thiha et al. 2007).

According to Ngo and Webb (2007), natural forests in the province were allocated to both households and communities while barren and degraded forests were allocated to households. However, they did not differentiate between individual households and a group of households as the recipients of FLA, and therefore it is unclear whether rich natural forests, or in other words protection forests, were allocated to individual households. They just introduced the project site in Phu Loc district as a case study of natural forest allocation, where people utilized the allocated forests for agroforestry practices.

It is likely that there was a clear demarcation to allocate natural forests to collective management entities like communities or groups of households and already degraded forests to individual households. Allocation of low-value degraded land could reduce the conflicts among the households and among villages over allocated lands, compared to allocation of still rich natural forests.

Shifting cultivation was historically an important farming system in mountainous regions of Vietnam. In Nam Dong district, however, the countermeasures against shift-

ing cultivation with a combination of FLA and Program 327 resulted in termination and erasure of the shifting cultivation footprints on hillsides (Tuan 2006). Program 661, known as the Five Million Hectare Reforestation Program, accelerated the expansion of tree plantations, resulting in an extensive establishment of fast-growing exotic species, mostly *Acacia hybrid*, and *A. mangium*, *A. auriculiformis*, *Eucalyptus camaldulensis*, *Cinnamomum cassia*, and rubber (*Hevea brasiliensis*), in degraded forests (MARD 2011). These species were also introduced to Nam Dong district (Thang et al. 2013), but since 2007, only *Acacia* spp has been replanted, and its area has been decreased from 450 ha in 2007 to 90 ha in 2012 (Nam Dong District 2011, 2013). Since rubber is categorized as a non-forest species and not recorded in the forestry statistics, the decrease in *Acacia* plantation area suggests a shift in species selection, from fast-growing species to non-forest species.

Compared to the total natural forest vegetation of 54,033 ha in 2004 detected by Thiha et al. (2007), district statistics show there were 44,495 ha of natural forests in 2012 (Fig. 3). On the other hand, 39,177 ha of forestland had already been allocated by the year of 2009 (Nam Dong District 2011), and there is no additional allocated area under the later FLA policy (Nam Dong District 2013). It is likely that this allocated area implies not only forests allocated to households and communities but also special purpose forests allocated to Bach Ma National Park Management Board.

In regard to forest loss, only 1.4 ha lost in 2010 and 5.5 ha lost in 2012 were recorded and both were caused by forest fire (Nam Dong District 2011, 2013). Though the district statistics do not show details of the allocated area and land use after allocation, it can be assumed that the large discrepancy between the natural forest vegetation in 2004 (Thiha et al. 2007) and natural forest area in the statistics afterwards was derived from conversion of natural forests to tree plantations as a consequence of FLA. No increase in the allocated forest area in recent years indicates that no more land remains and that the government has closed the books.

D village and FLA

According to older respondents, approximately half of the village members died during the war against France. They were forced to cut trees for road and bridge constructions. In the following war against the United States of America, defoliants were sprayed. It caused not only deforestation but also destruction of farm crops, which caused hunger among the people. The resettlement policy after independence again brought about hardship among the villag-

ers. The government provided the houses they now inhabit, but the passage of time brought about a difference in housing materials.

A Red Book (allocated land certificate) is issued to an individual, a household, a group of households, or a community to ensure the rights of certificate holders based on the 1993 and 2003 Land Law, and simultaneously indicates the obligations of the Red Book holders according to the 2004 Forest Protection and Development Law and other local government regulations. The book can be used as a mortgage to get a bank loan and a low-interest loan for tree planting. The activities of those allocated natural protection forests are strictly limited to protection purposes. Regardless of the type of forest, the state remains to be the owner of the land.

In D village, five groups of household were established as a trial in 1997, and each group leader held a Red Book. These groups were formed based on the willingness of the villagers considering household conditions such as surplus labor and the location of allocated forests. The number of joined households is shown in each Red Book and the list of household heads is attached. In 2010, another natural forest was allocated to the whole village in one Red Book, but few villagers were aware of this when we conducted the interview. Thus the number of respondents in Table 1 reflects only those who received the first allocation. The members were obliged to collectively protect the allocated area against illegal logging and forest fire especially during the dry seasons from July to September. In exchange, the Nam Dong district FPU vested a right to harvest wood for each household of a maximum of $3 \text{ m}^3 \text{ year}^{-1}$. In order to harvest this quota, local people need to get permission from the Commune People's Committee (CPC) initially and then the district FPU on each occasion. However, no households in the sample had ever harvested timber from the allocated natural forests.

Barren land and degraded forestland were allocated to individual households with a 50-year contract to encourage tree planting. Each recipient obtained a Red Book. Those who wish to get forestland needed to apply in writing to the CPC, who then forwarded it to the FPU and to the District People's Committee for the final decision. In the early stages when land was abundant, households could receive an allocation, but later it became more difficult. People who got allocation generally planted cassava in between the rows of *Acacia* spp. for the initial two years, and then clear-cut the trees after five to seven years.

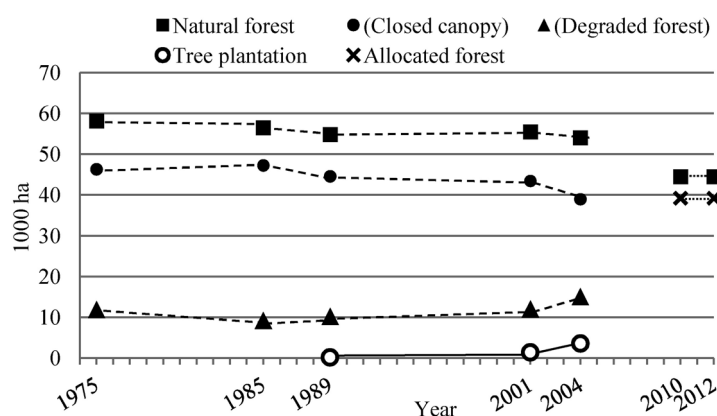


Fig. 3. Forest cover change by 2004 (Thiha et al. 2007) and natural and allocated forest areas in 2011 and 2012 (Nam Dong District 2011, 2013) in Nam Dong district.

Attributes of sample households

The average age of the Wealthy group was lowest (Table 2). The standard deviation of the household head age was much higher in the Average and Poor groups (17.98 and 17.97, respectively) compared to the Wealthy group (4.21). However, in general, one of the indicators for ranking a household into the Poor group was recent marriage. Therefore, it suggests that the former two groups consist of both recent marriage and elderly households, whereas the Wealthy group consists of the younger generation. Another remarkable characteristic is the difference in educational background: the Wealthy group had a highest education, Average was next, and the Poor group had a lowest education.

The average farmland area was largest in the Average group. The Wealthy group included a high rate of local authority officers (62.5%); therefore they did not engage in agriculture or have large plots of farmland. In every group, the farmland is limited, only 0.21 ha on average, and the crop harvested for food was not enough for self-consumption. Indeed, 84.8% of respondents answered that they experi-

enced food shortages almost every year, especially during the rainy and flooding seasons. Yield insufficiency was supplemented by NWFPs but they could not harvest during the rainy season. FLA added just 1.50 ha of forestland in addition to 0.21 ha of farmland on average for all respondents, or added 1.85 ha on average to the FLA recipients.

The wealth ranking applied by the government corresponded well with the survey results for annual income. The average annual household income of 2010/11 was largest in the Wealthy group (1,901 USD), though the farmland and tree plantation areas were largest among the Average group (0.26 ha). The average incomes of the Average and Poor groups were 1,564 and 1,070 USD, respectively. A higher educational background might provide better working opportunities for Wealthy group members (Table 2). However, the average annual income per capita for 78 sample households (313 USD) was on the one-dollar poverty line first set by the World Bank in 1990 (Ravallion *et al.* 2009). It was equivalent to one fourth of the national average in 2011, i.e. 1,333.6 USD (WB 2015).

Of 78 sample households, 67 (85.9%) applied FLA

Table 2. Household members, age and educational background of household head, and land tenure by wealth rank (2011)

Wealth rank	Household Member	Household head						Farmland (ha)	
		Age		Education					
Category	n	Av.	SD	Av.	SD	Av.	SD	Av.	SD
Wealthy	8	4.63	0.92	32.63	4.21	3.38	1.41	0.19	0.15
Average	34	5.03	1.68	42.44	17.98	2.59	1.21	0.26	0.20
Poor	36	4.89	1.37	41.28	17.97	1.94	0.98	0.18	0.09
Total	78	4.92	1.47	40.90	17.18	2.37	1.21	0.21	0.16

Note: Education was evaluated using number ranging from 1 to 5 which correspond to the educational levels of illiteracy, primary school, secondary school, high school, and university, respectively.

Table 3. Number of sample households with FLA (above) and households who harvested forest resources (below) by wealth rank (2010/2011)

FLA	Wealth rank			Total
	Wealthy	Average	Poor	
Allocated	8	29	30	67
<i>Natural forest only</i>	1	–	3	4
<i>Both</i>	2	14	15	31
<i>Plantation only</i>	5	15	12	32
No allocation	–	5	6	11
Total	8	34	36	78
Plantation	7	29	27	63
<i>Timber harvest</i>	2	18	18	38
Natural forest	3	14	18	35
<i>NWFP harvest</i>	4	16	24	44

and held either natural forest collectively or tree plantation individually (Table 3). Those who had natural forest allocation comprised four households and 31 (39.7%) households participated in natural forest management and at the same time managed tree plantations. However, 17 out of 35 households who had natural forest allocation did not know the exact location of the allocated area. Distribution of wealth rank and FLA were independent each other according to a Chi-squared test ($0.3590 > 0.05$). Distribution of wealth rank and tree plantation were also independent ($0.4836 > 0.05$). The average age of those who did not have plantation was 40 years old, while the age of household heads that had plantation was 41 years old on average. The result for the proportion of household heads under 30 years old was similar between groups with and without plantation, i.e. 23.8% and 26.7%, respectively.

FLA and livelihood

Allocated production forests in the foothills were mostly converted to acacia plantations. Natural forests at higher elevations were designated as protected forests. Of 134 ha of plantations allocated to sample households, 102 ha (76.1%) were monoculture of *A. hybrid* or *A. mangium* and rubber was planted in the remaining area.

Allocation of production forests was concentrated in two periods: 1995–2000 and 2004–2010 reflecting the two donor-aided projects conducted during these periods (Fig. 4). However, five households got allocations before 1995 when FLA formally started. Before the FLA, Khe Tre State Forest Enterprise controlled the forestland, and conducted a joint-plantation program with local households supported

by Program 327. Therefore some respondents believed this was the start of FLA though they had not yet obtained the rights outlined in the FLA policy. Of 54 FLA recipients, one got inheritance in 2006. One of the recipients obtained three different locations of forest in different years, but only the latest year acquisition was used in Fig. 4. The maximum area of FLA per household was 3.2 ha and the minimum was 0.35 ha. The average area was 1.26 ha.

After the support for seedlings and fertilizer provision as well as loans by the FLA-related projects ended, the FLA recipients purchased the seedlings from the private sector or prepared on their own, and transplanted them. Of 63 sample households who were allocated forest land, all households planted acacia and/or rubber, 49 households (77.8%) had never converted the land to acacia plantations, one household had harvested twice, 37 households had harvested once, and 12 households had established plantations but not harvested between 2005 to 2010. The average harvested volume was $70\text{--}80\text{ m}^3\text{ ha}^{-1}$ depending on planting density. Rubber was first introduced in 2003 and expanded to 41 sample households from 2006 to 2007. In addition to its relatively new introduction in Nam Dong district, hurricanes destroyed the plantations before any households had extracted rubber. Due to this shift and failure, few households yielded from FLA during the survey period.

Products from natural forests consisted of those for self-sufficiency and for sale. Every sample household collected firewood from nearby forests for domestic use. If firewood consumption during the survey period is evaluated and added to the income, the share of NTFPs (non-timber forest products) to the total income should be larger, but we could not determine this as there was no firewood market in the village. Firewood was collected both from tree plantations and natural forests, and dependency on firewood did not differ much among the wealth ranks.

Among various NWFPs collected in the survey period, namely rattan, bamboo shoots, wild honey, medicinal plants, and wildlife, rattan provided the highest cash income. As a matter of course, 15 households who did not have plantations earned no income from plantations (Table 4). In contrast, compared to 35 households who had natural forest allocation, the number of households who earned from natural forests was 44. Among 35 households who had natural forests, 24 engaged in NWFP collection in 2010/11. On the other hand, of 43 households who had no natural forest allocation, 20 reported cash income from natural forests. NWFPs, which can be harvested annually, contributed more to the household economy compared to timber sale from the plantations, which took place only once every five years if the harvest was not ensured. Indeed many households

collected firewood from pruned and thinned trees from plantations and plantations also contributed to livelihoods.

The average income of 44 households from NWFPs (237 USD) was higher than the average income of 38 households from timber sale (96 USD). The total income obtained from allocated forests was largest in the Average group (Fig. 5). However, the percentage of the income from allocated forests to total income was slightly larger in the Poor group (13.2%) than the Average group (12.2%). What is remarkable is the role of non-agricultural income in every group, which accounted for 72.0%, 67.4%, and 69.2% for Wealthy, Average, and Poor groups. Major sources of non-agricultural income were fixed salary and wage, wage and local business, and pension for the Wealthy, Average, and Poor groups, respectively.

As already mentioned, the Chi-squared test results on the relationship between wealth rank and FLA was independent and likewise no significant difference in the FLA conditions was observed for average age of household heads. Not only highly commercialized lowland rural societies but also village economies in agricultural marginal areas like D village face disequilibrium in assets and income as shown in Fig. 5. Thus it is necessary to evaluate whether the allo-

cated area affects the unequal distribution of land between different income levels. The left plot of Fig. 6 shows that the Gini Coefficient of land improves slightly from 0.3690 on farmland distribution to 0.3325 when the adjusted area of allocated forestland is added to the total land area of sample households. Likewise, the Gini Coefficient of income without FLA is 0.3288, and almost no change (0.3236) when actual income from the plantations and NWFP sales are added (right plot of Fig. 6). If we use potential harvest of *Acacia* plantation based on Ho and Nguyen (2011) instead of actual harvest, the total income of sample households obtained from allocated production forest will jump from 3,640 to 62,287 USD, and Gini coefficient will also improve to 0.2895.

Perceptions about FLA

The respondent's perceptions of FLA are presented in Table 5. The respondents made single free answer for each of positive and negative one. If they did not have an answer, it was included in category of "none" of each. Of 63 respondents who obtained production forest allocation, 37 respon-

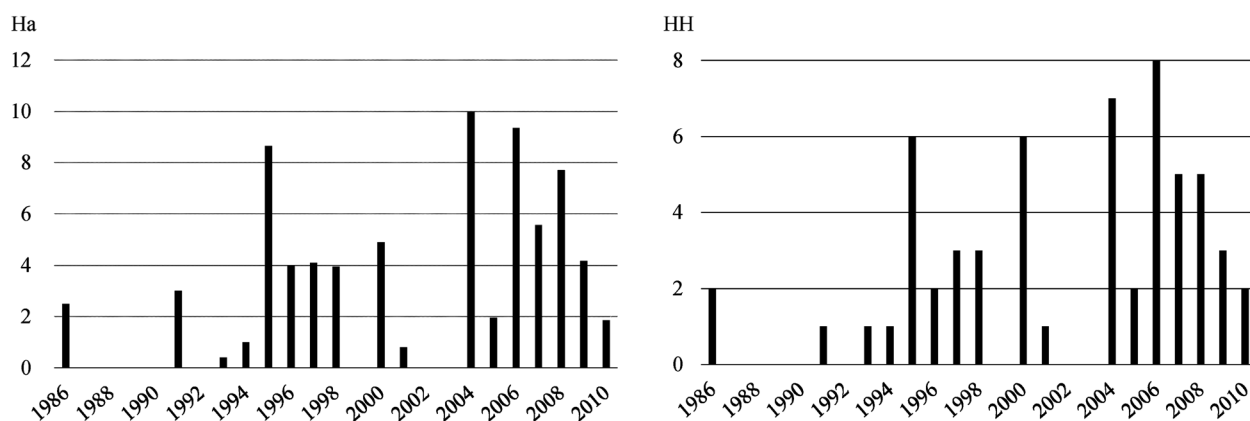


Fig. 4. Yearly allocated forest area to sample households (left) and number of sample household who had production forest allocation (right).

Table 4. Number of sample households who had FLA and who harvested timber and NWFP and the income (USD) from forest products in 2010/2011

FLA	n	NWFP		Timber sale		Total	
		HH	Income	HH	Income	HH	Income
Natural forest only	4	3	134	–	–	3	134
Both	31	21	206	19	55	26	261
Production forest only	32	16	74	19	61	26	134
No allocation	11	4	103	–	–	4	103
Total	78	44	133	38	47	59	180

Note: Firewood collection is not included.

dents made positive comments. Of these 37 respondents, 13 respondents (20.6% in total respondents) gave specific positive evaluations on the FLA "Red Book", and "government supports" like loans, seedlings, and fertilizers for tree planting were of larger concern (24 respondents; 38.1% in total respondents). However, of 24 respondents listed "government support" as their positive comments, while 13 respondents also complained about lack of "financial support" as their negative comments. The location of allocated forest was another factor that determined dissatisfaction with FLA among the respondents.

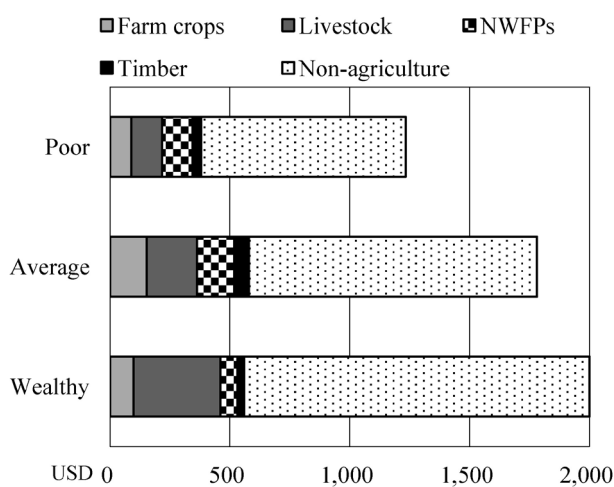


Fig. 5. Average annual income per household by source of income and by wealth rank (2010/2011).

At the last time they planted, 34 of 63 respondents (54.1%) who obtained production forest allocation borrowed from the bank. Twenty-five respondents (39.7%) prepared the necessary investment by themselves. However, the investment priority to the plantations was lower compared to livestock. Of the total 78 respondents, 55 (70.5%) listed livestock as the first priority for investment. The percentage was even higher among those who had plantations: 47 (74.6%) of 63 gave the highest priority to livestock.

This weak concern for FLA does not mean people do not consider the necessity of FLA. Regardless of whether they had allocation or realized yield or not, the respondents still want to participate in FLA according to the interviews. The reasons were: timber stock has a significance of saving, food intercropping in the early stage of plantation can support food scarcity, firewood can be obtained from pruning and thinning, less labor input for maintenance, and a low-interest loan is available for timber plantation. They would lose nothing by having FLA because participation was free regardless of transaction cost needed for the procedure, supporting mechanisms were readily available, and they had immunity from taxation on the property.

DISCUSSION

Previous studies reported disorders and conflicts among villagers when FLA was implemented, particularly in the

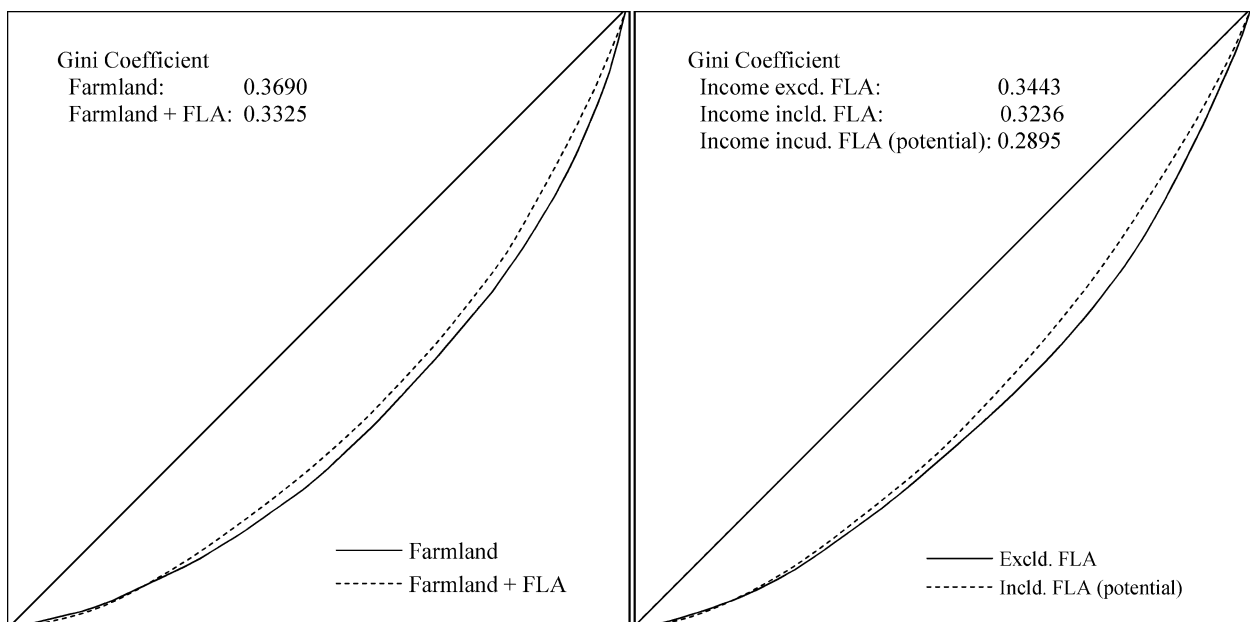


Fig. 6. Lorenz Curve and Gini coefficient for land (left) and income (right) of respondents. Forestland area is adjusted equivalent to one sixth of the farmland.

areas where people still practiced shifting cultivation (Tran and Sikor 2006, Sikor and Tran 2007, Thang et al. 2013). Studies focusing on the forest cover change in 1990s or up to early 2000s were also negative and critical of FLA (Jakobsen et al. 2007, Thiha et al. 2007, Gomiero et al. 2000). In D village, where shifting cultivation was no longer practiced and degraded forestland was left, the problem was rather on the administrative procedure and it was reported that the SFEs, the former forest management entities, were resistant to the reform. After 10 years have passed, such a confusion has been settled and the current issue is how to utilize the allocated land.

FLA observed through the present case study is the combination of a private property regime to encourage tree planting on degraded forestland and creation or enhancement of collective management of natural forests with better conditions. Degraded natural forests were categorized as production forests and distributed to individual households based on voluntary application. Among the lands allocated to respondents, none was left as bare land and supporting schemes at the initial stage encouraged conversion of the allocated bare land to tree plantations.

A part of natural forests categorized as protection forests was first allocated to groups of households, and then another part was recently allocated to the whole village. In contrast to the stable utilization of the land allocated to individual households, locations and boundaries of the natural forests allocated to groups of household and the village were not recognized among the villagers and thus every villager rather utilized the surrounding natural resources to support their livelihoods. The allocated natural forests were utilized *de facto* under open access. A commonly applied mechanism for collective management, namely vesting a group with exclusive usufruct rights on specific natural resources over a designated area, and in exchange, imposing obligations to conserve the resources, was not found in D village. If a depletion in natural forest resources is currently not apparent, it might simply be derived from a relatively

low pressure on the resources. Whether this is true or if there is an effect of FLA or not could not be determined by the present study and remains to be solved. The depletion of profitable resources may take place in the future unless regulating mechanisms for the natural forest utilization is introduced.

The allocation of the resources to selected socio-economically vulnerable people was not part of the scope of FLA in Vietnam. It was likely regarded ethnic minorities as vulnerable on the whole, but as indicated by the wealth ranking, they do not live in a homogeneous society. The case of D village revealed that every economic stratum received an allocation of production forests. It suggests no bias in two senses: neither elite capture nor preferential treatment were performed. Consequently, such a seemingly random allocation resulted in just a slight improvement of unevenly distributed agricultural assets, namely farmland, among the respondents. The Gini coefficient of farmland suggests an uneven distribution of the property among villagers, and it is just slightly improved when adjusted FLA area is added to farmland possession by each sample household. Likewise, Gini coefficient of incomes of sample households excluding those derived from FLA is slightly improved when actual incomes from FLA are added. However, the change becomes larger when every recipient of production forests converts the area to, for example, *Acacia* plantation and maximizes the yield.

FLA created numerous smallholders of tree plantations, and consequently this did not contribute significantly to income generation mainly due to size considerations. Taking an assumption of six-year rotation and two-year intercropping in between the rows of tree crops at the initial stage of plantation, it is roughly estimated that 15 % of FLA can be used as farmland. As the average area for 54 households who received production forest allocation was 1.34 ha, FLA brought about 0.21 ha additional farmland for upland cultivation per household. If there was a more profitable alternative use than cassava, the contribution of FLA to in-

Table 5. Evaluation of FLA for individual households (n = 63, single free answer)

		Positive comments			Total
		Red Book	Government support	None	
Negative comments	Location	6	1	8	15
	Financial support	1	13	4	18
	Timber price	1	0	0	1
	Age (too old)	2	7	1	10
	None	3	3	13	19
	Total	13	24	26	63

come generation would be more apparent. If the FLA recipients successfully manage the Acacia plantations, they would be associated with twenty-fold increase in income from timber harvest. Or rubber plantation, for example, would ensure an annual cash income but at the same time the area for food intercropping would be greatly reduced due to a longer rotation period for rubber monoculture.

Details of income sources revealed that the majority of rural societies in agricultural marginal areas are no longer farmers. Whether D village is an exception should be determined with examination of other cases under similar socio-geographic conditions. However, previous studies reviewed in this article do not show the income by source and thus cannot be used for comparison.

Among the respondents who pointed out government support as an advantage of FLA, more than half were not satisfied with the actual support received (Table 5). The respondent's concern was livestock, which was one of the thresholds of wealth ranking by the government. More than 70% of respondents gave the first priority of investment to livestock, which suggests the importance of small-scale livestock rearing in areas facing land shortage. Sustainability of rapidly expanded tree plantations, that have made Vietnam to be one of the few forest gain developing countries, might depend on the continuous support of the government. In the future, external supports to disadvantaged areas should be directed toward integrated land use and manifold livelihood options.

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