



# **Hydropower plant development and forest recompensing plantation in Viet Nam**



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**By:**

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## Abbreviations

CODE	Center for Development and Environment in Ha Noi
CPC	Commune People's Committee
CSOs	Community-based Social Organizations
DARD	Department of Agriculture and Rural Development
DONRE	Department of Natural Resources and Environment
DPC	District People's Committee
DPI	Department of Planning and Investment
EVN	Electricity Cooperation of Viet Nam
FFPD	Fund of Forest Protection and Development at provincial level
FPMBs	Forest Protection Management Boards
FR	Forest Replantation
IHA	International Hydropower Association
IUCN	International Union for Conservation of Nature
MARD	Ministry of Agriculture and Rural Development
MOIT	Ministry of Industry and Trade
PPC	Provincial People's Committee
TBI	Tropenbos International
UNDP	United Nations Development Programme
USD	United States Dollars
VND	Viet Nameese Dong
WCED	World Commission on Environment and Development

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A Vuong hydropower plant in Quang Nam province of Viet Nam

## Abstract

Viet Nam has converted a large area of natural forest to the development of hydropower and promoted the forest replantation programme to compensate the loss of natural forest. However, by 2013, only 3,7% of the converted forest areas had been subject to replantation. Therefore, the research aims to review the hydropower development and forest recompensing policy, and give recommendations to improve policies. Research results in the central and central-highland provinces show that the local authorities have succeeded in collecting money from hydropower companies to allocate budget to the protection forest management boards to replant new forests on their land. But this study shows that the results achieved in forest areas, forest quality, effectiveness of forest replantation and benefits of reforestation, are modest compared with expectations. One of the most important reasons affecting the results of implementation is that the policy is not yet complete. Policy is formed mainly top-down, from central government agencies to local level.



# 1. Introduction



Viet Nam's energy industry has developed rapidly in the last twenty years. Statistical figures released by the Ministry of Industry and Trade reveal that 99% of communes and 98% of households in Viet Nam use electricity. The expansion of this sector as well as increased power generation has provided better services to societies all across the country, particularly in mountainous and rural areas. However, the increase in the number of hydropower plants has led to negative impacts on natural resources, biodiversity conservation and local livelihoods.

From 2006-2013, almost 202 hydropower development projects were given licenses to convert over 19,805 ha of forest land to hydropower plants across Viet Nam's 27 provinces. Although the Forest Protection and Development law and other legal documents require tree replacement in the wake of these conversions, related policies have not been strictly enforced. By 2013, only 3,7% of the affected areas had been subject to replantation.

The surge in hydropower plants construction has also led to unexpected results from resettlement programmes for thousands of affected local people. Survey results show that some 550,000 local residents were uprooted to make way for the hydropower plants, even though actual construction plans are far behind schedule. This has triggered negative repercussions on the socio-economic and cultural infrastructures of numerous communities, especially upland ethnic minority groups.

Additionally, hydropower plants are responsible for much of the damage to downstream areas in Viet Nam. Water is captured during the dry season and released in the rainy season, which deny local people and crops the resources they need at the proper times. Local

people have tried to bring the owners of hydropower plants to court to seek damages inflicted by the plants' poor communications regarding water retention and release. However, because there has been no consistent policy to regulate the profits between local people and hydropower plants, this remains a controversial issue.

## 2. Objective

**This research aims to review the hydropower development, forest recompensing policy, and give recommendations to improve policies. Four specific objectives are identified as follows:**

1. Review the hydropower development in Viet Nam and its emerging issues related to resettlement and livelihood restoration problems;
2. Review the change of forest land after hydropower development and its impacts on forest protection efforts and biodiversity conservation;
3. Identify the gaps and constraints between national policy and practical enforcement at local level, in which governance issues (decision making process, partnership between policy makers at all levels) related to forest replantation after conversion to hydropower dams are central;
4. Give recommendations for improved policies regarding forest replantation after hydropower dam construction and sustainable forest governance in Viet Nam and lessons learnt to other countries promoting hydropower development like Viet Nam.

## 3. Research Methodology

### **Analytical framework and research approaches**

Before 1975, hydropower dam construction was considered a symbol of nation-building and national pride for the growth of many developed countries, but this perception changed significantly as a result of environmental and social movements. Advocacy of social and environmental activists has changed mind-sets regarding hydropower development where now a majority of people pay more attention to environmental and social values rather than economic values regarding hydropower dam construction decision-making, especially those in developed countries (Biswas, 2012). Hydropower renewability and sustainability has been questioned worldwide (Gagnon et al., 2002; Wang et al., 2014) because of negative impacts on environment and society. Forest loss due to hydropower development is a big concern worldwide.

Forest replantation is a great effort of Viet Nam for the sake of mitigating the loss of forest acquired for constructing hundreds of hydropower reservoirs for many decades toward more sustainable development. The question how the forest recompensing programme has been formulated and implemented in practice to promote the sustainability of hydropower development is very much connected with the governance manner of the re-forestation in

Viet Nam. Therefore, this study uses internationally accepted definitions of sustainable development and good governance to clarify the research goal.

Firstly, sustainable development is defined as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 8). Here, sustainability is operationalized into three elements and often depicted as diagrams: three concentric circles, three pillars supporting a roof, and three integrated circles (see Figure 2-1). The notion of the three concentric circles is that both social and economic developments are seen to be constrained by the environment. The three pillars of sustainability mean that economic, environmental, and social dimensions should be treated equally. The new concept is an interaction between the social, economic and environmental aspects of human activity needs to maintain a healthy environment, promote investment in sustainable livelihoods and support economic growth. This balance is best shown by integrating three circles, which means that any single sustainable dimension must compromise with two other sustainable aspects (Schumann et al., 2010).

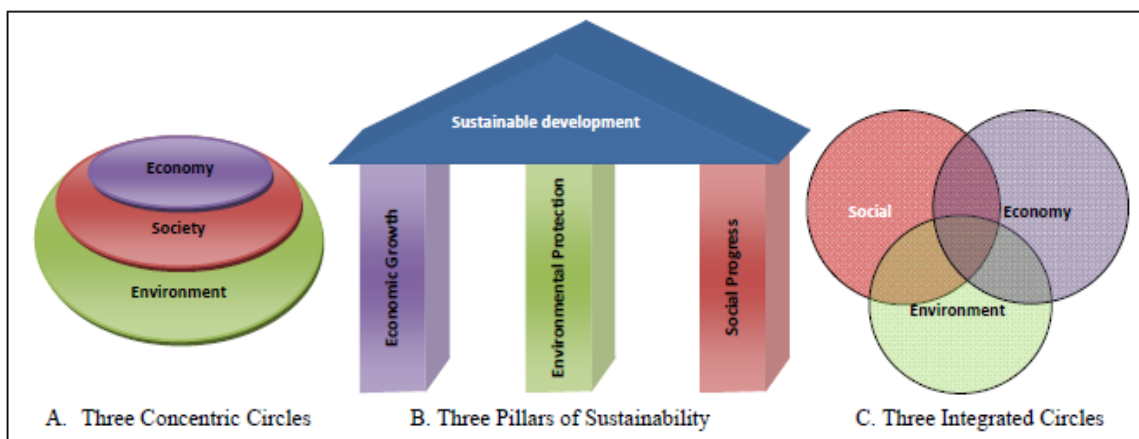


Figure 3.1. Three dimensions of sustainability. (Source: Schumann et al., 2010)

However, the trade-offs among three dimensions of sustainability rely much on the power relation among decision makers. Therefore, it is crucial to raise five questions on sustainable development about: Who initiates? Who decides? Who participates? Who benefits? And who controls? If the focus of these questions is the people who are directly influenced by the development, then it can be assured of sustainability (Holmberg , 1992).

Every society desires for justice and sustainable development, but it seems to be very difficult to achieve in practice. One reason is the obstruction of interest groups who dominate decision-making processes and development-implementation activities. Therefore, equitable development can only be achieved when governance is well-designed and effectively implemented for each developmental type at different scales to control power relation and distribution among different stakeholders. UNDP (1997) defines governance as the exercise of economic, political, and administrative authority to manage a country’s affairs at all levels. It places emphasis on the mechanism, processes and

institutions through which citizens and groups convey their interests, perform their legitimate rights, satisfy their involvement, rule of law, responsiveness, consensus orientation, equity, effectiveness and efficiency, accountability and strategic vision. If these aspects are well-organized, good governance is achieved and can contribute significantly to long-term, sustainable development strategies; to policy consistency through vertical and horizontal organization; to an open, transparent procedure, involving and consulting stakeholders; and to bringing sustainable development strategies closer to local communities and to people. Good governance stimulates accountability, transparency, efficiency, and rule of law at all levels and allows well-organized management of human, natural, economic, and financial capital for equitable and sustainable growth, as well as allows for assurances of the participation of civil society organizations (CSOs) in decision-making processes. Good governance and sustainable development are two separate concepts that are definitely tied together. Good governance does not guarantee sustainable development, but its absence severely limits sustainable development and can, at worst, impede sustainability of development (Kardos, 2012).

The forest replantation programme after hydropower development is complex with a wide spectrum of financial institutions, project owners, operators, developers, governments, regulatory bodies, intergovernmental agencies, civil society, and affected stakeholders. Therefore, it is crucial to employ appropriate approaches to investigate the complexity and dynamics of governance at different levels, scales, stakeholders, and dimensions. To this end, a multi-stakeholder approach is used to examine roles, influences, and interactions of different stakeholders in the reforestation programme in which five elements of nine good governance criteria (including transparency, equity (gender), accountability, effectiveness and efficiency, and participation; table 2-1) are selected to investigate to what extent good governance was implemented.

**Table 1. Elements of good governance**

Elements of governance	Definitions and criteria
Participation	Both directly and indirectly affected persons, men and women, should have a voice in decision-making, either directly or through legitimate, intermediate institutions that represent their interests. There should be a consultation process
Rule of law	Legal frameworks should be fair, predictable, stable, and enforced impartially, particularly with regards to laws on human rights
Transparency	Processes, institutions, and information should be directly accessible to those concerned and affected, and enough information should be provided to render these understandable and controllable
Responsiveness	Institutions and processes should serve all stakeholders

Consensus orientation	Good governance should mediate differing interests in order to reach broad consensus on the best interests of the group and, where possible, on policies and procedures
Equity	All men and women, directly and indirectly affected people, should have equal opportunity to maintain or improve their well-being
Effectiveness and efficiency	Processes and institutions should produce results that meet needs while making best use of resources
Accountability	Decision-makers in government, the private sector, and civil-society organizations should be accountable to the public, as well as to institutional stakeholders. This accountability differs depending on the organization and whether the decision is internal or external to an organization
Strategic vision	Leaders and the public should have a broad and long-term perspective on good governance and human development, together with a sense of what is needed for such development

*Source: Adapted from good governance policies of UNDP (1997); World Bank (1994); ADB (2004); Nwanze & Kouka, 2010; WCD (2000); and IEA (2000)*

## Research methods

**Research process:** In order to achieve effective and accurate results, a series of participatory activities will be carried out, including consultation of potential partners to agree how to organize research work, share information, and facilitate a national workshop. The research methodology will involve some case studies and 24 interviews with key informants, including staff and leaders of the Provincial Department of Agriculture and Rural Development; Trade and Commerce; Division of Forest protection; the provincial fund of forest protection and development in seven provinces in Central and Central-Highland, to discover their participation, roles and opinions about the governance of the forest replantation programme at their province. Based on secondary information available, supporting research will also focus on the assessment and analysis of collected information.

**Study sites:** In this research, we selected seven provinces in Central and Central Highland region where hydropower has been intensively developed in recent decades, including Quang Nam, Binh Dinh, Phu Yen, Khanh Hoa, Gia Lai, and Kontum province. Hydropower dams selected for surveys in each province are both state-owned and private owned companies. We also carried out surveys with small, medium, and larger hydropower plants. These hydropower dams are legally obliged to compensate forest losses.

### Research design and methods:

Research objectives	Data/information	Sources	Research tools/activities
Objective 1: Overview of the policy	<ul style="list-style-type: none"> <li>- Overview of hydropower development in Viet Nam and selected provinces</li> <li>- Forest land loss (ha); biodiversity loss due to</li> </ul>	<ul style="list-style-type: none"> <li>- Available reports of government agencies, local authorities regarding</li> </ul>	<ul style="list-style-type: none"> <li>- Secondary data collection</li> <li>- Literature review</li> <li>- GIS and remote</li> </ul>

	<p>hydropower development in Viet Nam and selected provinces</p> <ul style="list-style-type: none"> <li>- Legal framework for replanting lost forests at national and local level (province, district, and commune)</li> </ul>	<p>programmes for forest compensation</p> <ul style="list-style-type: none"> <li>- Published research reports, papers, and conference proceedings</li> <li>- Legal documents</li> <li>- Maps, satellite images, forest land use statistic reports</li> </ul>	<p>sensing software for interpreting images, such as ArcGIS and ENVI</p>
<p>Objective 2: Evaluation of implementation in selected provinces</p>	<ul style="list-style-type: none"> <li>- Forest replantation planning after conversion (planning documents)</li> <li>- Planted forests (ha), types of forests (name of forest trees or forest land types), places (name of places), and costs for planting (USD or VND)</li> <li>- List of relevant stakeholders involved in the forest replacement programme, including roles, interests, power influence, relationship, conflicts, communication flow, and recommendations of each stakeholder for future actions</li> <li>- Governance issues (transparency, equity (gender), accountability, effectiveness and efficiency, and participation)</li> <li>- Financial issues (Who pays? Who decides? How to spend? Related costs? etc.)</li> <li>- Land issues: available land (ha), whose land? How to use land for this programme?</li> <li>- Capacity of relevant staffs and leaders of the programme (number of staffs, educated level,</li> </ul>	<ul style="list-style-type: none"> <li>- Secondary information sources</li> <li>- Leaders and staff making decisions and working for the forest replacement programme at national level and selected provinces, districts, and communes</li> <li>- Hydropower companies</li> <li>- Local communities and people involving in this programme</li> <li>- Local NGOs</li> </ul>	<ul style="list-style-type: none"> <li>- Secondary data collection</li> <li>- Semi-structured interviews with key informants</li> <li>- In-depth interviews</li> <li>- Field observations</li> <li>- Telephone, email, or online surveys if possible</li> </ul>



	specialization, etc.)		
Objective 3: Policy recommendations	<ul style="list-style-type: none"> <li>- Solutions for strengthening the legal foundation for the programme and fillings the gaps between policy and practice</li> <li>- Solutions to increase the efficiency and effectiveness of the forest replacement programme</li> <li>- Solutions to increase the accountability of government and authorities at all levels, participation of needed stakeholders (especially local communities and people, civil organizations)</li> </ul>	<ul style="list-style-type: none"> <li>- Leaders and staff making decisions and working for the forest replacement programme at national level and selected provinces, districts, and communes</li> <li>- Hydropower companies</li> <li>- Local communities and people involving in this programme</li> <li>- Local NGOs</li> </ul>	<ul style="list-style-type: none"> <li>- Semi-structured interviews with key informants</li> <li>- In-depth interviews</li> <li>- Telephone, email, or online surveys if possible</li> <li>- regional workshop</li> </ul>

**Data analysis:** In this study, data is more qualitative than quantitative, and therefore 25 interviews with local staff and leaders in seven provinces were coded to different topics to analyse during writing the report.



## 4. Overview of hydropower development in Viet Nam and forest loss

### The evolution of hydropower in Viet Nam

Viet Nam's early experiences with electricity are reflected in the story '*upside down lamp – cây đèn lộn ngược*', which recounts officials of the Nguyen Dynasty who first saw electric streetlights when visiting France in 1863. In 1892, the French built the first small electricity generating plant (nhà máy đèn) in Ha Noi to serve 523 streetlights. In 1943, the first hydropower dam, Ankroet in Lam Dong province, was constructed with an installed capacity of 2.3MW, which mainly served schools, hospitals, and especially French hotels in the city of Da Lat (Lam Dong PPC, 2014). After independence in 1945, the state placed electricity generation high on the agenda of public investment: "electricity must go earlier than other policies." For rural development, the phrase "*điện, đường, trường, trạm - electricity, roads, schools, stations (clinic, post office, and others)*" has become the slogan for public investment. In national electricity development planning since 1945, hydropower is often emphasized, and it has evolved along with the *Doi moi*—economic reform process.

Between 1945 and 1975, the period of the Viet Nam War, only two hydropower dams were constructed. The first one, Da Nhim, south of the Dong Nai river basin, was put into operation in 1964 with Japanese governmental funding, with a total installed capacity of 160MW, which generates over 1000 GWh/year. The Da Nhim reservoir supplies more than 550 million cubic meters of water each year for irrigation of 20,000 ha of arable land in Ninh Thuan Province, the province with the lowest average annual rainfall. The second hydropower plant, Thac Ba in the north, was completed in 1975 after 12 years of construction and has an installed capacity of 120MW, which generated 70% of total electricity production throughout the North at that time. It was devastated repeatedly during the war, but restored with great pains under the slogan "*The nation needs electricity as the body needs blood*" (Nguyen Hoai Nam, 2010). After reunification in 1975, several large hydropower projects, such as Hoa Binh (1979) and Tri An (1984), were launched but not completed in the period up to 1986, as this was the period of least dynamic development in Viet Nam.

Between 1986 and 1994, the first stage of economic reform took place in Viet Nam. In this period, the Hoa Binh hydropower plant was put into operation in 1994 after 15 years of construction. At the time, it was the largest hydropower dam in Southeast Asia, with an installed capacity of 1,920MW. To complete this dam, Viet Nam mobilized a huge amount of labour and money. Construction displaced 9,305 households with more than 58,000 people. The reservoirs of the the dam inundated 13,000 hectares of twenty-four communes. Once in operation, the Hoa Binh hydroelectric plant contributed about 9,000 GWh per year, which accounted for 30-40% of overall electricity production. The contribution of the Hoa Binh hydropower plant together with thermal power plants exceeded the power demand in the north. Therefore, a north-south high-voltage grid was built with a length of 1,487km to provide electricity to the central and southern regions and. It was completed in 1994, at the

same time as the Hoa Binh dam (Hoang Viet Cuong, 2009). Together with the Tri An hydropower project, the second largest dam was completed in 1991 with an installed capacity of 400 MW and an annual electricity output of 1700 GWh, supplying Ho Chi Minh city (Tu, et al., 2011). Hoa Binh stood out as a symbol for the era of accelerating growth and unchallenged modernization in Viet Nam in the 1990s, the 'happy days' when the renovation process ushered in a new era of progress and pride (EVN, 2009).

Between 1995 and 2005, economic growth increased to an average of 7.5% per year, whereas the demand for electricity expanded at 15% per year. Therefore, Viet Nam embarked on large hydropower dam projects in the Central Highlands and the Dong Nai river basin in the South, including Yali (180 MW),<sup>1</sup> Vinh Son (66 MW), Song Hinh (70 MW), Thac Mo (150 MW), Ham Thuan (300 MW), and Da Mi (175 MW) (Institute of Energy, 2006). During this period, state-owned companies constructed the majority of these dams.

From 2006 to present, Viet Nam developed an even more ambitious electricity development plan. The government prepared necessary policies, legal instruments, and human forces for a new building plan; for example, Electricity Law (2004); Land Law (2003) and its lower guidelines; Environmental Protection Law (2005); Law on Competition (2006); Business Freedom policy for members of Communist Party (2006); WTO membership (2006); and other policies. As a result, Electricity Plan 6 for the period from 2006-2011 and Plan 7 for the period between 2011 and 2015 toward 2030 was formulated to promote electricity development in which hydropower was prioritized. However, the government did not have sufficient financial resources for implementation. Therefore the government opened the process to allow private sector investment in the construction of small and medium-sized hydropower dams. This strategy was consistent with the liberalization policy in the electricity market. At the same time, the government decentralized investment licensing, project approval, and hydropower development planning to provincial governments. The resonance of these conditions became the catalyst for the booming of hydropower projects across the country to meet the increasing demand of electricity of 13.8% per year (Khanh Toan, et al., 2011). As a result, 32 large hydropower dams and 16 medium hydropower plants were constructed in this period. Particularly, the Son La hydropower dam, with an installed capacity of 2400 MW, was put into operation in 2012, considered as the largest hydropower dam in the Southeast Asia.

Figure 3-1 shows that hydropower dams are constructed mainly in the Northern and Central highland regions of Viet Nam. According to the survey by the Ministry of Industry and Trade (MOIT), 260 hydropower plants are currently in operation, with an installed capacity of 13,694 MW; 211 projects are under construction and will be in operation by 2017 with an installed capacity of 6,712MW; 266 future projects, with an installed capacity of 3,410 MW, are being considered to license to investors (MOIT, 2013). In 2013, total hydroelectricity production of Viet Nam was 56.94TWh, representing nearly 70% of Viet Nam's theoretical hydropower potential. By 2017, Viet Nam will have exploited nearly all its theoretical

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<sup>1</sup>The installed electricity capacity of power stations

hydropower potential, compared to a global average of 35% of exploited hydropower potential (IHA, 2014).

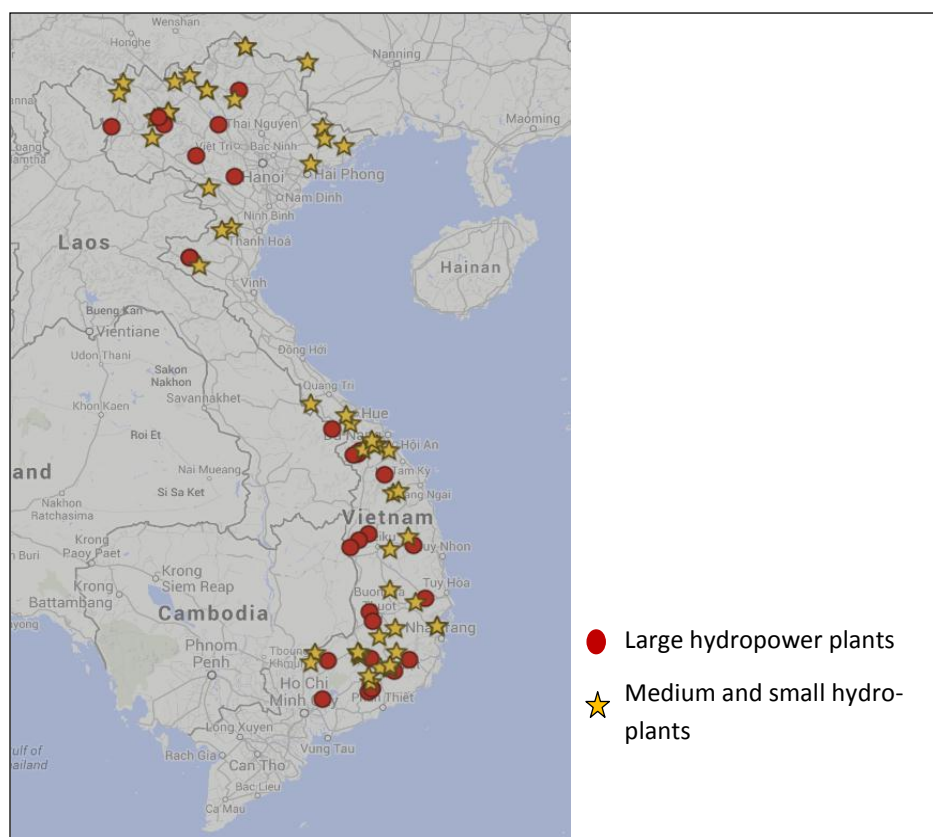


Figure 1. Locations of operating hydropower dams in Viet Nam  
(Source: Authors’ research from the internet)

Table 4.1. Hydroelectricity potentials in main river watersheds in Viet Nam

River basin	Region	Potential installed capacity (MW)	Theoretical hydroelectricity potential (TWh)	(%)
1 Lo – Gam – Chay	North	1,120	4.10	4.9
2 Đa	North	6,960	26.96	32.3
3 Ma	North	890	3.37	4.0
4 Ca	North	520	2.09	2.5
5 Vu Gia – Thu Bon	Central	1,360	5.10	6.1
6 Tra Khuc – Huong	Central	480	2.13	2.6
7 Ba	Central – Highland	670	2.70	3.2
8 Se san	Central – Highland	1,980	9.36	11.2
9 Srepok	Central – Highland	700	3.32	4.0
10 Đông Nai	South and Central Highland	2870	11.64	14.0
<b>Ten watersheds</b>		<b>17,550</b>	<b>70.77</b>	<b>84.5</b>
<b>All country</b>		<b>20,560</b>	<b>83.42</b>	<b>100</b>

(Source: EVN, 2009)

Until 2030, Viet Nam will continue to give priority to building hydropower dams, focusing on small hydro projects. Currently, 179 small projects (2360MW) are under construction, 249 projects (2327MW) are to be approved, and 155 potential locations are available for further development. Viet Nam aims to exploit the theoretical hydroelectricity potential completely to meet a forecasted demand of electricity consumption, which is expected to increase 1.6 times by 2020 and 4.5 times by 2030, as compared to current electricity demand.

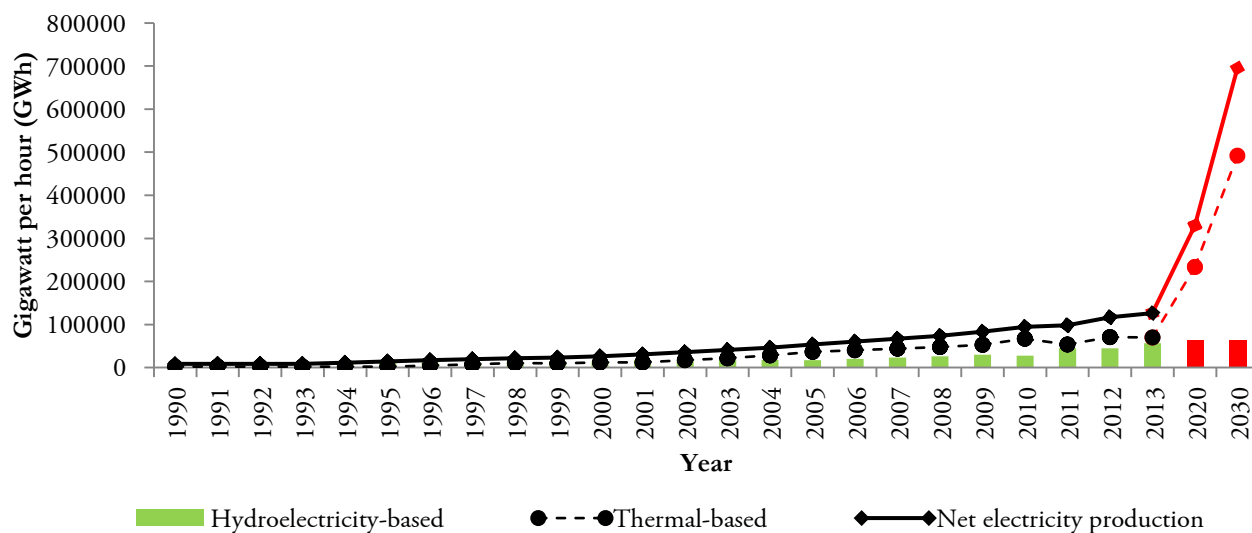


Figure 4-2. Electricity production from 1990 to 2013 and forecasted (in red lines) to 2030  
(Source: EVN, 2009; United Nation, 2013)

As Figure 3-2 shows, the role of hydroelectricity will remain important until 2030. However, after 2020, the national electricity grid will depend on a mostly fossil-fuel source-based electricity production. Therefore, Viet Nam has begun to build hydropower dams in Laos and Cambodia in 2010 to supplement the national electricity grid (MOIT, 2013). Thus, the hydropower development plan of Viet Nam is almost complete. With these considerations, a comprehensive assessment is necessary to detect the benefits and consequences of hydroelectric development.

### Loss of land and valuable ecosystem

To date, over 620,000 ha of land has been lost, in which small hydropower dams account for 6%. Most of lost lands are forest and agricultural lands. The loss of agricultural land to farmers was not adequately compensated after displacement and resettlement. This has caused long-lasting grievances and denouncements from local to national levels related to land acquisition for hydropower dams, inadequate compensation, and poor management of resettlement programmes (CODE, 2010; Dao, 2010; Institute of Energy, 2011; MOIT, 2013; Ty, et al., 2013).

Till recently, as the number of small hydropower dams has rapidly increased, many policy makers thought that small dams required little forested land. But in fact these dams destroyed large areas of forest. For example, Ha Nang hydropower dam with an installed capacity of 11 MW, caused 36.15 ha of natural forest loss; Dak Ru dam was installed with a

capacity of 7.5 MW and destroyed more than 100 ha of natural forest; and for Dak Po Co dam, an area of 117.2 ha of natural forested land was cleared. According to the strategic environmental impact assessment of the electricity development plan from 2011 to 2015 and toward 2030, the total area of lost land will be approximately 25,133 ha flooded by 21 large hydropower dams in 2030, including 4,227 ha of natural forests, 1,367 ha of plantation forest, 5,961 ha of agricultural land, 737 ha of residential land, and 12,810 ha of pastures and bare land (Institute of Energy, 2011). The loss of land has also caused a substantial loss of rich biodiversity land areas (see Table 3-2).

**Table 4.1. Affected land area of highly biodiversity natural reserves**

Hydropower projects	Nature protected areas	
	Name	Affected area (ha)
<b>Bac Me</b>	Bac Me	24,238
	Du Gia	1,144
<b>Ban Chat</b>	Nam Don	3,592
<b>Dak Mi 1</b>	Ngoc Linh	23,061
	Song Thanh	9,541
<b>Dong Nai 2</b>	Tay Nam Lam Dong	1,168
	Song Thanh	6,601
<b>Dong Nai 5</b>	Cat Tien	19,092
	Tay Nam Lam Dong	9,798
<b>Hua Na</b>	Mu Cang Chai	298
	Nam Don	21,144
<b>Lai Chau</b>	Muong Nhe	77,968
<b>Srepok 4</b>	Yok Don	20,229
<b>Trung Son</b>	Pu Hu	12,533
	Pu Luong	1,025
	Xuan Nha	11,298
<b>Total affected protected areas</b>		<b>540,432</b>

(Source: Institute of Energy, 2011)

## 5. Forest recompensing policy after hydropower development and roles of relevant stakeholders

The government of Viet Nam has paid much attention to reforest after the war. The country formulated many national forest plantation programmes to develop and recover degraded forests, including a 5 million hectare reforestation programme (661/QĐ-TTg), 327/CT, 556/TTg, 147/2007/QĐ-TTg and many reforestation projects funded by international organizations. In 1943, Viet Nam had 14.3 million ha of natural forests, covering 43% of the total area of the country, but it declined to 9.18 million ha, 27.2% of the total area. Since 1995, forest area has increased as a result of reforestation and rehabilitation programmes. In 2006, the forest area increased up to 12.9 million ha corresponding to 38% of the total area of the country (FAO, 2009) and went up to 13.9 million ha with a forest cover of 41% in

2013 (MARD, 2014) (see Table 4.1). The objective of the forest development strategy of Viet Nam is to increase the forest land area up to 16.2 million hectares with a forest cover of 47% by 2020. However, this objective has been hindered by the conversion of natural forests to other types of development. The conversion of nearly 20,000 hectares of forests is one of the main reasons.

**Table 5.1. Forest area and cover of Viet Nam in 2013**

Year	Total forest land area (1000 ha)	Natural forest (1000 ha)	Planted forest (1000 ha)	Newly planted forest (1000 ha)	Forest cover (%)
2008	13,118	10,348	2,770	342.7	38.7
2009	13,2589	10,338	2,919	-	39.1
2010	13,388	10,305	3,083	357.1	39.5
2011	13,5150	10,285	3,229	377.0	39.7
2012	13,8620	10,424	3,438	398.4	40.7
2013	13,9540	10,398	3,556	396.0	41.0

*(Source: General Office of Statistics, 2008-2013)*

Recognizing the importance of maintaining the forest cover above 40% as stated in the forest strategy, the government of Viet Nam has issued several policies to oblige developers to compensate lost forests. The legal framework was regulated in the Forest Protection and Development Law in 2004 and Decree 23/2006/NĐ-CP on the implementation of the Law in 2006. The decree regulates that competent authorities granting investment license to convert forests to other purposes must ensure new forest replantation for lost forests due to the conversion. In 2013 the first forest recompensing policy was issued under circular 24/2013/TT-BNNPTNT. According to it, all project developers must design a forest replantation plan and submit it to provincial authorities for review and approval when the project converts forests. In case of forest conversion taking place in multiple provinces, project owners must prepare individual plans and send them to each involved province for approval. The provincial department of agriculture and rural development (DARD) is leading the screening committee. It includes representatives of the departments of DARD, natural resources and environment (DONRE) and investment and planning (DPI), leaders of district authorities where forest land are being converted, and scientific organizations. At least five representatives must be invited to participate in this committee. After reviewing, the committee sends its decision to the Provincial People’s Committee (PPC) for approval. After approval, project owners must collaborate with local authorities to find appropriate lands to plant designed forests as planned. In the circumstance of no land available in the intended province, local authorities must submit a request letter to the Ministry of Agriculture and Rural Development (MARD) to find land in other provinces to implement the forest replacement plan. If lands are not available to replant forests, project developers can pay a

certain amount of money to the fund of forest protection and development at provincial level (FFPD). The amount is estimated in terms of costs for basic surveys, designs, forest plantation, and management after planting until forest are matured enough. MARD decides the amount of money that project owners must pay to FFPD. The circular also enclosed a template to prepare the forest replacement plan and a letter to send to competent authority to approve the plan.

In 2015, a new circular, numbered as 26/2015/TT-BNNPTNT, was issued to amend circular 24. In 2016, two circulars are combined into a single circular, numbered 05/2016/TT-BNNPTNT to unify the policy of alternative forest plantation after conversion to other purposes. In this new circular, roles of organizations and individuals are defined more clearly: project owners (both organizations or individuals) who change the destination of forests are responsible for organizing reforestation plans for replacing to be submitted to the Provincial People's Committee for approval (see Table 5-4 for steps to implement a forest recompensing plan).





## 6. Results and discussions

### Recompensing the lost forests at national level

According to MARD, 2,320 investment projects acquired forest land areas for non-forest development projects with a total forest area of 76,040 ha. Of this 2,540 ha of forest area was replanted in 2013. A remaining 73,500 ha of area is needed to replace lost forests due to the conversion (MARD, 2014).

Recognizing the importance of forest recompensing to lost forests, state organizations organized many activities to guide the local authorities on technical preparation, to insist on the implementation of the law, and to strengthen inspection and monitoring activities on a national scale. At the 8th session of the National Assembly XIII, Resolution No. 62/2013/QH13 (dated 11/27/2013) was issued on strengthening the management of the planning, construction and operation of hydroelectric exploitation, in which the National Assembly officially obliged hydropower companies to strictly implement the responsibility to complete the forest replacement planting in 2014. On 24 January 2014, the Prime Minister issued Directive No. 02/CT-TTg on strengthening the steering performance of alternative forest plantation programmes; and then at the regular meeting, the government issued Resolution No. 11 /NQ-CP (dated 18/02/2014) on the action plan of the government to implement Resolution No. 62/2013/QH13 of the National Assembly XIII.

After that, the Minister of Agriculture and Rural Development issued Decision No. 829/QĐ-BNN-TCLN, approving the forest replacement plantation scheme. The Ministry regularly issued guidelines and urged the implementation by local authorities through Document No.4403/BNN-TCLN (dated 12/10/2013) on implementing the reforestation plans after the conversion of forests to build hydropower projects; Document No. 1779/BNN-TCLN (dated 05/06/2014) on implementing the alternative forest plantation plan in 2014; and Document No. 8103/BNN-TCLN (dated 10/08/2014) on reinforcing control by local authorities of the replantation programmes. Additionally, the Ministry of Agriculture and Rural Development organized three conferences to promote the implementation of the programme in three regions: North, Central and South; it organized thirteen missions to check and evaluate the status of conversion of forest to other uses, and it sent two teams to inspect the result of forest replantation in eight provinces with large forest areas required to replant, including Lai Chau, Lang Son, Thanh Hoa, Nghe An, Dak Lak, Dak Nong, Gia Lai and Lam Dong province. Based on the direction and guidelines of state institutions, MARD prepared a plan to replant a forest area of 13,410 ha in 2014, in which 11,290 ha of forests converted to hydropower and 2,120 ha of forests converted to other purposes; 31,510 ha of forests in 2015, in which 10,050 ha of forests converted to hydropower and 21,460 ha of forests converted to other purposes; and 28,570 ha of forests in 2016 (MARD, 2014). It proves that the government

aimed to focus on forest replantation for lost forests due to conversion to hydropower projects.

In 2014, however, only 28 out of 55 provinces initiated the forest replantation programmes, in which only 4,648 ha of forest area were planted, reaching 35% of the original plan; of these 2,445 ha of forest were planted in hydropower projects, accounting for 22% of the plan. The local authorities nearly having implemented their plans, are Tuyen Quang, Lao Cai, Ha Giang, Quang Ninh, Son La, Hoa Binh, Thua Thien Hue and Kon Tum. Localities with major tasks to replant without fulfilling them, are Lai Chau, Thanh Hoa, Gia Lai, Quang Ngai, Khanh Hoa, Binh Phuoc, and Tra Vinh (see Appendix 1). Localities with an obligation to replant forests but not having implemented this obligation effectively, are Nghe An, Dak Lal, Lam Dong, Dak Nong, Quang Nam, Phu Yen and Lang Son (see Appendix 2). Many hydropower projects must implement forest replantation programmes but have not taken action in 2014 (see Appendix 3). Thus, the results are very meager compared to the plan set out.

In 2015, MARD promoted many activities to speed up the progress of the programme nationwide. MARD issued circular 26/2015/TT-BNNPTNT (dated 29 July 2015) to adjust and supplement new regulations to resolve existing problems (see Section 4 for details of the circular). In addition, the government organized more supervision activities at local level to investigate problems and find solutions to help local authorities and project owners to accelerate the forest plantation. Up to 20 September 2015, MARD examined the implementation in northwestern provinces and the Ministry of Planning and Investment (MPI) organized a supervision visit in Central highland. Based on the review of local authorities in 2015, the plan was to plant 22,300 ha of new forests due to conversion to non-forest development activities, in which hydropower project owners must plant 8,800 ha and other development projects the remaining 13,500 ha. According to MARD (2015), only 23 out of 55 provinces have planted 8,089 ha of new forests, reaching 36% of the plan. However, forests planted by hydropower companies have increased significantly. Hydropower companies in 11 provinces have planted a total forest area of 5,709 ha, which is 65% of the original goal (see Appendices 4 and 5 for more information).

Thus, although the state and government have put a lot of efforts to realize the programme in practice, the implementation encounters many difficulties constraining the outputs of the programme. However, if we compare the forest replantation areas of hydropower projects with those of other development projects, planted forest areas of hydropower projects are much larger than those of others, as illustrated in Table 5-1. In 2015, the local authorities and hydropower companies planted 9,154 ha of new forests nationwide, i.e. 40% of the total lost forests converted to hydropower. The expected result did not satisfy the expectations of the government, as mentioned at two online meetings of the government with local authorities (16 December 2014 and 16 December 2015).

**Table 6.1. Converted forest and newly planted forests due to conversion to hydropower development in Viet Nam between 2013 and 2015**

Regions	Total converted forests (ha)	Converted to hydropower (ha)	Planted forests (ha)				Remaining non-planted forests (ha)	
			Total	2013	2014	2015	Converted to hydropower	Converted to other development types
Mountainous northern	14,160	4,963	2,391	381	364	1,646	2,572	8,206
Plain northern	4,743	0	0	0	0	0	0	4,659
Central northern	11,519	5,408	3,654	0	904	2,750	1,754	4,680
Central coast	10,199	3,287	853	612	241	0	2,434	4,217
Central highland	21,573	8,132	2,253	3	936	1,314	5,879	9,167
South eastern	9,588	256	0	0	0	0	256	9,097
South western	4,258	299	5	5	0	0	294	3,336
<b>Total</b>	<b>76,040</b>	<b>22,345</b>	<b>9,154</b>	<b>1,000</b>	<b>2,445</b>	<b>5,709</b>	<b>13,191</b>	<b>43,362</b>

(Source: MARD 2015)

During these online meetings, five main reasons were identified that caused the ineffective implementation of the programme. First of all, most Provincial People’s Committees did not pay sufficient attention to steer and assign responsibilities to their subordinate units to collaborate with project owners to prepare forest replantation plans and to enforce the legal responsibilities of investors to recompense forests converted by their development. Secondly, most project owners didn’t actively design forest replantation plans, not even if local authorities asked them to do so. Thirdly, many local authorities accepted project owners to deposit money per hectare for lost forests into the provincial fund on protection and development forest if they could not replant forest themselves. The money was not allocated to replant forests, but used for forest management and protection. Fourthly, it was very difficult to ask completed projects to replant converted forests: project management boards were dismissed or projects were transferred to other investors for exploitation. Last but not least, local authorities couldn’t find available land areas for replantation.

### **Hydropower development-induced forest loss and replantation in Central region**

#### **Forest loss due to conversion to hydropower**

According to a report of the Ministry of Agriculture and Rural Development (MARD, 2015), the total forest loss due to conversion to hydropower development is 22,340 ha in 30

provinces, including 4,963 ha in the northern mountainous region; 5,408 ha in the northern central; 3,287 ha in the central coast; 8,132 ha in the central highland; 256 ha in the eastern south; and 299 ha in the western south. Thus, most of lost forests for hydropower development has taken place in central and central-highland region. Therefore, this study selected hydropower dams in seven provinces in these areas to show how forests were lost due to hydropower reservoir construction, including Thua Thien Hue, Quang Nam, Binh Dinh, Phu Yen, Khanh Hoa, Gia Lai, and Kon Tum province, and to investigate what problems led to the poor implementation of forest recompensing after conversion.

**Table 6-2. Converted forests in seven provinces in central and central-highland region**

Province	Total converted-forests (ha)	Conversion to hydropower	
		Area (ha)	Percentage (%)
Thua Thien Hue	1,472	1,079	73.3
Quang Nam	4,258	2,216	52
Binh Dinh	1,554	126	8.1
Phu Yen	417	300	71.9
Khanh Hoa	592	340	57.4
Gia Lai	4,460	812	18.2
Kon Tum	2,083	745	35.8

(Source: MARD, 2014)

To see how forests have changed after the conversion to hydropower, the forest cover was estimated for 10 selected reservoirs and 500 m buffer zones surrounding (Table 5-2). The results of reclassifying forest cover by using Landsat images indicate that the total forest loss of 10 reservoirs is nearly 6,000 ha of forests, and therefore each reservoir converted about 600 ha of forests on average. Over one third of lost forest is natural forest. This study also looked at the forest change in 500m buffer zones surrounding the reservoirs. The results of landsat image reclassification revealed that the plantation forest area has slightly increased, but the natural forest area around the reservoirs significantly decreased. Thus, the construction of reservoirs caused the loss of forests not only in the reservoirs but also in the surrounding forests (see Appendices 6-15 for the results of Landsat images' classification maps comparing forest loss and changes inside and surrounding reservoirs).

**Table 6.3. Forest losses in selected hydropower reservoirs**

Name of hydropower reservoirs	Forest loss for reservoirs (ha)		Forest change over 500m buffer zones around reservoirs (+/- ha)	
	Natural	Plantation	Natural	Plantation
Binh Dien <sup>2</sup>	986	212	-1185	+1065

<sup>2</sup> See Appendix 6: Forest land change map after building Binh Dien reservoir in Thua Thien Hue province

Name of hydropower reservoirs	Forest loss for reservoirs (ha)		Forest change over 500m buffer zones around reservoirs (+/- ha)	
	Natural	Plantation	Natural	Plantation
Huong Dien <sup>3</sup>	744	1102	-1833	+1382
A Luoi <sup>4</sup>	82	0	-469	+652
Van Phong <sup>5</sup>	26	0	+17	+25
Pleikrong <sup>6</sup>	0	1764	0	-3546
Yali <sup>7</sup>	63	5	-395	+74
Vinh Son <sup>8</sup>	118	30	-42	-86
A Vuong <sup>9</sup>	42	2	-735	861
Song Bung 4 <sup>10</sup>	167.50	494.06	-1211.71	-523.06
Song Bung 5 <sup>11</sup>	42.72	58.08	-393.14	+201.98
<b>Total</b>	<b>2271.62</b>	<b>3666.8</b>	<b>-6248.4</b>	<b>105.47</b>

(Source: Authors' survey and mapping)

## Existing problems in Central Viet Nam

Results from interviews with local leaders and staff of relevant organizations working on forest replantation and opinions from the national workshop organized in 2015 revealed that there are many reasons for the ineffectiveness of the forest recompensing programme:

### 6.1.1. Delayed implementation due to incomplete and inconsistent legal regulations

To regulate forest recompensation, the National Assembly and the Government have formulated the legal framework, but it is not well-designed to guide the implementation at a local level. Although article 13 of the Forest Protection and Development Law of 2004 stipulates that "... In the case of conversion of natural forests to other uses, natural forests must be planned to reforestation to ensure the sustainable development of forests at local and national scale" and in 2006 the new Decree 23/ ND-CP stipulates that "The competent agencies allowing the conversion of a forest for other purposes must ensure the investment for forest replantation with the same converted area to other uses", there were no specific

<sup>3</sup> See Appendix 7: Forest land change map after building Huong Dien reservoir Thua Thien Hue province

<sup>4</sup> See Appendix 8: Forest land change map after building A Luoi reservoir Thua Thien Hue province

<sup>5</sup> See Appendix 9: Forest land change map after building Van Phong reservoir in Binh Dinh province

<sup>6</sup> See Appendix 10: Forest land change map after building Pleikrong reservoir in Kontum province

<sup>7</sup> See Appendix 11: Forest land change map after building Yali reservoir in Gia Lai and Kontum province

<sup>8</sup> See Appendix 12: Forest land change map after building Vinh Son reservoir in Binh Dinh province

<sup>9</sup> See Appendix 13: Forest land change map after building A Vuong reservoir in Quang Nam province

<sup>10</sup> See Appendix 14: Forest land change map after building Song Bung 4 reservoir in Quang Nam province

<sup>11</sup> See Appendix 15: Forest land change map after building Song Bung 5 reservoir in Quang Nam province

guidelines to train and support local authorities to take actions on the forest replantation programmes recompensing to the forest loss after conversion to hydropower dams. Therefore, no forest replantation programme was implemented during this period. In 2008, the government issued Decree 05/2008/NĐ-CP to specify the developers who have to deposit an amount of money to the provincial fund of forest protection and development, corresponding to the costs of replanting new forests, but it did not regulate how to manage and spend the desopit. The director of the Binh Dinh province fund of forest protection and development stated that “we received deposit from some hydropower companies to plan new forests, but we could not spend this deposit because we did not know which financial regulations should be applied to spend money legally.” (Interview with leaders of Binh Dinh FFPD, 2015). In 2014, circular 24/TT-BNNPTNT and circular 26/TT-BNNPTNT were issued to provide provisions and guidelines for forest replantation due to conversion to non-forest development types. Thus, the regulation of forest recompensing took a long time before it was effective. During this period, between 2004 and 2013, the conversion of forest to hydropower development had no legal basis to regulate budget for forest replanting (opinions of the leader of Kon Tum FFPD at the National Workshop, 2015).

The promulgation of two circulars assisted provincial authorities to design, collect funds from hydropower companies, and implement new forest replantation programmes, but the rules and guidelines of these circulars were not specific and strict, causing difficulties for local authorities and hydropower companies in the implementation of reforestation plans. For example, the mentioned circulars did not specify clearly which organizations were responsible for monitoring forest plantation, the forest maintaince after plantation, forest quality improvement, and the benefit sharing mechanism after forests being matured. Therefore, local authorities did not design or take any actions to monitor the forest plantation by the implementation agencies. Hydropower companies did not have any role in monitoring their fund after transferring money to the PFFPDs (interviews with leaders of PFFPDs and DARDs, 2015). Additionally, the unclear provisions of the circulars was the reason that local authorities and hydropower companies understand the regulations differently and implement inconsistently in different provinces. In Binh Dinh and Quang Nam province, hydropower companies did not transfer money to the FFPD but replanted new forests themselves, because the Provincial People’s Committee allowed them to plant new forests on their lands. For example, Tra Xom hydropower company in Binh Dinh province planted nearly 30 ha forest land in 2014; Kon, Tr’sHy, Tranh 2 and Tranh 3 companies in Quang Nam planted nearly 300 ha in 2015 (Interviews with PFFPDs, 2015). However, other companies in Khanh Hoa, Kon Tum, Gia Lai, Phu Yen province were asked by DARD to transfer money to the PFFPDs to implement forest replantation programmes (interviews with PFFPDs, 2015). Different provinces also allocated the funds differently to various components of the forest replantation projects. The percentage of budget for each forest replantion activities of the project was quite different from province to province (opinions at the national workshop, 2010).

In addition, many provisions in the circulars have not created favorable conditions for hydropower companies to implement forest replantation, such as regulations that replaced

forests must be planted in protection or special-used forests, whereas hydropower companies did not have the eligible forest lands for forest plantation. Moreover, many hydropower projects constructed in 2014 and 2015 did not have cost estimations for forest replacement planting, thus hydropower companies were not actively financing the forest replacement planting activities (interview with hydropower companies in Khanh Hoa province, 2015; and opinions of leaders of PFFPDs at the national workshop, 2015).

At provincial level, the PFFPDs assisted the Provincial People’s Committee to elaborate the process of forest replantation projects in their province. However, the process often takes eleven steps (see Table 5-4 for example of the process in Khanh Hoa and Binh Dinh province) so it often causes the delay of payment to the forest plantation agencies, leading to the inappropriate forest plantation period as forests can be only planted at certain times a year. This leads to a poor quality of planted forests (opinions of many leaders of PFFPDs at the national workshops, 2015).

**Table 6.4. The process of implementing the forest replantation activity at provincial level**

Steps	Activities	Responsible agencies
Step 1	Drawing up forest replantation plans	- Hydropower companies draw up the plans if they have eligible lands to plant forests  - If hydropower companies do not have suitable forest lands, they pay an amount of money equivalent to the expense estimated to plant forests to the FFPD at provincial level. PFFPDs contract consulting companies to draw up plans for forest replantation.
Step 2	Reviewing the plans	- Committees at provincial level review all plans. Such a committee is chaired by Department of agriculture and rural development. Other members are representatives of Departments of natural resources and environment, investment and planning.
Step 3	Approving the plans after reviewing	- If the plans are successfully screened by the committees, the chairman of the Provincial People’s Committee signs a decision to approve the plans.
Step 4	Preparing the detailed technical plans and estimating the costs of forest plantation	- Based on approved plans, hydropower companies or PFFPDs contract competent consultation companies to design detailed plans and estimate the costs of the plans
Step 5	Approving the detailed technical plans and estimating the costs of forest plantation	- Hydropower companies or PFFPDs review and approve detailed technical plans and estimate the costs of forest plantation prepared by consultation companies
Step 6	Opening procurement for selecting a competent company to implement the plans or appointing a company	- Based on detailed technical plans and estimating the costs of forest plantation, companies submit their technical and financial documents to bid the plans with other companies. Mostly companies are appointed by hydropower companies or PFFPDs

Steps	Activities	Responsible agencies
Step 7	Reviewing the technical and financial documents prepared by appointed company	- The Department of agriculture and rural development, with the assistance of PFFPDs, review and approve the technical and financial documents
Step 8	Signing of contracts and implementing the signed contracts	- Hydropower companies or PFFPDs sign a contract with the winning contractor - The contractor implements the forest replantation as agreed in the signed contract
Step 9	Monitoring the implementation of the contract	- Hydropower companies or PFFPDs contracts a consultation company for monitoring and evaluating the implementation of the plan
Step 10	Reviewing the first year of implementation, financial settlement and payment of contractor for the first year	- After the first year, hydropower companies or PFFPDs carry out a review to settle and pay the contractor (the forest plantation agencies) for the first year of implementation. The final decision of paying to the contractor depends on the evaluation of the consultation company on the results achieved as agreed in the contract
Step 11	Planning for the successive years	- Hydropower companies or PFFPDs coordinate with the contractor and other consulting companies to make a new plan for successive years after reviewing the results of the first year.

*(Source: Interviews with FFPD and hydropower companies in Binh Dinh and Khanh Hoa province, 2015)*

### **6.1.2. Lack of coordination and communication between the government, MARD, and local authorities leading to ineffective implementation of the forest replantation policy**

As reported by the Ministry of Agriculture and Rural Development in 2014 and 2015, the implementation of reforestation plans is often delayed at the local level because of the low willingness of local authorities and hydropower companies as well as insufficient understanding of the importance of the policy. MARD criticized most local authorities and hydropower companies for a) their passive reactions after the circulars for forest replantation were adopted and for not actively spending budget on replanting alternative forest; b) paying less attention to the supervision on the forest plantation. Some local authorities were criticized for requesting hydropower project owners to transfer money to PFFPDs without implementing the plans to spend budget to replant forests; some local authorities were criticized for spending money on forest management and protection rather than on replanting alternative forests. Furthermore, the government and MARD reported that local authorities did not organize inspection and monitoring activities during and after replanting new forests (MARD, 2014 and 2015).

However, according to local authorities (confirmed in our interviews and national workshop) the government and MARD issued circulars but did not give guidance how to implement the forest replantation after conversion. The circulars also were incomplete and inconsistent, so they could not be put into practice. After promulgating these circulars, the government and



MARD delegated the implementation tasks to the local government but did not provide direct guidance, technical and financial training for staffs and leaders of implementation agencies, information sharing, and direct orders to hydropower companies (built large hydropower plants licensed by the government not by local authorities) to force them to pay for the cost of forest replantation (key informant interviews, 2015).

At a local level, according to the circulars, provincial and district people's committees (PPCs and DPCs), hydropower companies, DARD, DONRE, DPI, and PFFPDs are main organizations who are responsible for replanting new forests after conversion to other purposes. However, in practice DARDs, PFFPDs, and PFMBs are the most important stakeholders who execute the forest replantation programmes in each province. As confirmed at the national workshop (2015), DARD is the leading department at each province to assist the PPCs to review the forest replantation plans made by of PFFPDs with the support of consultation agencies or the plans designed by hydropower companies for approval. DARD also guides PFFPDs and PFMBs to design and implement technical and financial components in the plans, evaluates the results, stimulates these agencies to execute the plans on time, checks the forest plantation, reviews the results of forest plantation, technically manages the forest after being planted and reports the results to the PPCs at request. The PFFPD is the supporting agency directly run by DARD in each province to collect the forest replantation fund from hydropower companies and manage this fund. The PFFPD plays the role of executive investor on behalf of DARD. Each year, the PFFPD hires consultation agencies to design the plan of forest replantation to submit to DARD and PPC to review and approval. Then the PFFPD appoints a forest management board or a forest company to implement the approved plan to replant new forests. The PFFPD plays a role as intermediary agency between DARD and implementation agencies which are PFMBs or FCs. These agencies get the funding from the PFFPD to spend for forest replantation. Thus, there is a lack of the participation of other stakeholders to carry out the forest replantation programme, including hydropower companies, DPCs, DONRE, and DPI. In particular, hydropower companies should be the main agencies responsible for organizing forest replantation after conversion but this duty is transferred to the PFFPDs. Meanwhile, according to leaders of the PFFPDs, they are not equipped sufficiently with management rights of finance and equipments to organize forest plantation activities at the request of the DARD, and also lack human resources. They are units with financial autonomy and the small amount of money they get (10% from the payment of hydropower companies to plant forest) is not enough to organize inspection and supervision of forest replantation projects in the mountainous areas. Many hydropower companies are not active in designing forest replantation plans as requested by the circulars of MARD. When they are not able to implement forest replanting projects themselves, they must pay a certain amount of money to provincial PFFPDs, but they often delay the payment or do not pay at all. Most hydropower companies are criticised by local authorities and mass media because of poor responsibilities to compensate the loss of natural forests converted to hydropower. The research team found that the companies were facing difficulties to deal with this responsibility because local authorities could not allocate sufficient land areas for them to replant new forests. A leader

of hydropower company in Khanh Hoa province said that they submitted the forest replantation plan to DARD for review and approval, but DARD refused their plan because they planned to replant new forests on lands ineligible for plantation. As a consequence they must plant new forests on protection forest land types which are approved on the forest development and protection planning map as the protection forest land. However, hydropower companies do not possess this type of forest land, and therefore their only choice was to transfer the budget to the PFFPD to replant forest for them (key informant interview, 2015).

### **6.1.3. Conflicts with local people on land**

As mentioned above, hydropower companies do not have protection forest land areas to replant new forests, and therefore land areas of forest protection management boards were selected to plant new forests. In practice, PFMBs planted new forests in vacant lands, but there were conflicts with local people who accessed these lands for crop cultivation (even if these lands were officially managed by PFMBs). In Binh Dinh province, local farmers destroyed 28.8 ha of new forests planted by the Tra Mom hydropower company. Local people claimed that the new forest trees were planted on their lands (key informant interview with leaders of Binh Dinh PFFPD, 2015). This also happened in Khanh Hoa, Quang Nam, Gia Lai and Kontum province. As mentioned in the national workshop (2015) it is difficult to recover lands used by local people, because local authorities do not have sufficient budget to compensate for their crops cultivated on these lands.

### **Discussions: Lessons learnt to improve the policy and enhance the effectiveness and efficiency**

- 1) Replanting new forests for compensation of forest loss due to hydropower development helps Viet Nam to reduce the negative impact of the conversion of forest land to other land use types. Viet Nam is the first country in Southeast Asia who initiated the forest replantation obligation after conversion. This policy reflects Viet Nam's commitment to sustainable development. However, whether a policy is successful depends on many factors. To carry out laws they must be designed in accordance with the capacity of human, financial and other resources.
- 2) Research results in the central and central-highland provinces show that the local authorities have succeeded in collecting money from hydropower companies to allocate budget to the protection forest management boards to replant new forests on their land. The amount of money collected from hydropower companies is significant and could help local authorities to plant new forests to compensate converted forest lands. Local authorities have made efforts to fulfill the annual targets set by MARD to replant new forests. All provinces set up PFFPDs to assist local authorities to execute the forest replantation programmes. The awareness to

comply with rules for forest replantation has improved, thanks to the strong intervention of the government and MARD: they strengthened the legal framework, organized online meetings with local authorities, and carried out more inspection at local level to promote the deployment of reforestation plans.

- 3) The replantation policy is meant to offset the forest area being converted to hydropower. But this study shows that the results achieved in forest areas, forest quality, effectiveness of forest replantation and benefits of reforestation, are modest compared with expectations. One of the most important reasons affecting the results of implementation is that the policy is not yet complete. Policy is formed mainly top-down, from central government agencies to local level. During policy formulation, the issued circulars primarily assign the responsibility of forest replantation to state agencies. Meanwhile, the experience of forest plantation in Viet Nam shows that the forest plantation programme is difficult to succeed without the involvement of local people, non-governmental organizations, local authorities at district and commune level. However, this study shows that the forest replantation policy only benefits the local forestry sector without consideration to the interests of other stakeholders, such as local communities who lack land for planting economic forests. Local people do not benefit from the forest replantation programme, and as a result, FPMBs often face resistance from local farmers when replanting new forests on lands reclaimed by local people. Theoretically, this policy could be considered as a successful programme similar to the 5 million hectare national afforestation programme that Viet Nam has organized successfully and that contributed significantly to the increase of forest cover in Viet Nam, from 38% in 2006 to 41% in 2013. However, the forest replantation policy has not been well-designed. The circulars issued to promote forest replantation have been implemented as a single plantation project at the local level rather than a national programme. With that thought, the circulars were issued only to grant local authorities the right to make decisions on planting new forests in their administrative boundaries. And therefore, during the initial years after the circulars were adopted, only a few provinces started planting new forests to compensate lost forests for hydropower. Only when the results were disappointing, and the government and MARD had taken action to force provincial leaders to take stronger steps to compel hydropower companies to contribute to the PFFPD, the process of reforestation has improved in terms of surfaces planted forest areas. But the quality of the replanted forests is not controlled and monitored effectively.
- 4) As a result of ineffective and inefficient implementation of forest replantation policy, there is a number of studies and workshops being conducted for evaluation and recommendations to improve the policy of forest replantation. The solutions

suggested in different studies and workshops are similar to the findings of this present study: (a) integrate the alternative forest planting programmes into the planning of forest protection and development at local level in order to avoid overlapping. The programme should not just focus on planting alternative forests but should use the funds also to recover existing young forests and natural forests that cost less budget than planting entirely new forests; (b) improve the existing regulations with more detailed provisions in price units per hectare of forest plantation, and define clear roles for relevant stakeholders in inspecting and monitoring the implementation of the policy at local level, as well as management and benefit mechanisms after the forest is matured; (c) forest plantation dossiers should be transparent to local authorities in districts and communes to enable them to participate in monitoring; (d) current regulations of forest replantation after conversion should introduce more legal rules or sanctions to oblige hydropower companies to pay forest replantation; (e) evaluate the effectiveness of organizations from central to local level within the forest replantation policy to develop new guidelines and regulations to unify the implementation and coordination among relevant stakeholders; (f) the programme should engage more forest owners to replant new forests on different types of forest land, such as households, local communities, forest companies, individuals who have rights on forest lands. Our observations indicate that the duty of forest replantation should be transferred to hydropower companies who convert forests to hydropower development. Local authorities and its subordinates should play a role in reviewing, approving, monitoring, and evaluating the implementation of the forestation programmes. Hydropower companies should be able to make contracts with different types of forest owners to plant new forests, not only on protection forests but also production forests.

- 5) Generally, although this policy needs to be further implemented in the coming years, there is a big gap between policy and practice. As Viet Nam is a country with a lot of experience in the implementation of reforestation policies, good practices should be used to design and implement policies more effectively. In particular, the duties to alternative forest planting should be transferred to hydropower companies. If state agencies formulate a suitable legal framework for the stakeholders involved in the forest replantation programmes, the effect will be bigger. The costs of planting alternative forests should be calculated early in the investment plan of hydropower companies, plan for land acquisition, displacement, and resettlement to actively manage the funding for planting alternative forests. The goals of the programme should be diversified more, and beneficiaries of the programme should be extended to local forest owners rather than only PFMBs. Especially, the programme should pay more attention to people displaced by the construction of hydropower projects,

people are using the forest lands that belong to protection forest management boards or forestry companies, people with forest land but without capital for planting new forests. The involvement of local people will play a key role in the success of this programme. In addition, the programme needs to be integrated with existing forestry programmes, such as the payment for forest environmental services, REDD+, the FLA for community protection and management.

## 7. Conclusion

The findings of this study show that the government of Viet Nam does not achieve the objective of replanting new forests after conversion to hydropower dam construction as illustrated from the modest outputs of the forest replantation programme. The reasons are ineffective implementation, poor management of budget, poor forest quality after replantation, and limited benefits for local people due to lack of participation. The policy is not yet complete and is mainly following top-down approach, from central government agencies to the local level. A good governance approach should be used to design and implement this policy to ensure that lost forests due to conversion to hydropower are adequately compensated. The forest replantation should involve more participants from local level and be integrated with other forest plantation and protection programmes to mobilize better resources and increase the effectiveness and efficiency of policy implementation.



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## Appendices

### Appendix 1. Provinces that should plant a large area of alternative forests, but have not yet implemented.

Ref	Provinces	Number of hydropower plants	Total converted forests (ha)	Plan to plant alternative forests 2014 (ha)	Planted forests as requested (ha)
	<b>Total</b>	<b>40</b>	<b>5.273</b>	<b>3.131</b>	Not implemented
1	Lai Chau	8	2.427	1.500	Not implemented
2	Thanh Hoa	7	1.350	600	Not implemented
3	Gia Lai	18	816	460	Not implemented
4	Quang Ngai	1	71	71	Not implemented
5	Khanh Hoa	2	275	200	Not implemented
6	Binh Phuoc	3	184	150	Not implemented
7	Tra Vinh	1	150	150	Not implemented



**Appendix 2. Provinces that should plant a large area of alternative forests, but have implemented inefficiently**

Ref	Provinces	Number of hydropower plants	Total converted forests (ha)	Plan to plant alternative forests 2014 (ha)	Planted forests up to Dec 2014	
					Forest land area (ha)	Compared with initial plans 9ha)
	<b>Total</b>	<b>69</b>	<b>8.143</b>	<b>5.717</b>	<b>1.325</b>	<b>23,2</b>
1	Nghe An	14	1.796	1.200	320	26,7
2	Dak Lak <sup>12</sup>	8	264	1.000	110	11,0
3	Dak Nong	13	3.535	2.000	120	6,0
4	Lam Dong	9	647	450	139	30,8
5	Quang Nam	18	1.366	817	562	68,7
6	Phu Yen	4	300	150	25	16,7
7	Lang Son	3	236	100	50	50,0

**Appendix 3. Hydropower projects with low commitment to plant alternative forests**

Ref	Hydropower projects	Alternative forests (ha)
1	Son La hydropower	385,3
2	Ban Chat hydropower in Lai Chau province	330,0
3	Lai Chau hydropower in Lai Chau province	1.533,8
4	Huoi Quang province Lai Chau province	120,0
5	Bac Giang hydropower in Bac Giang province <sup>13</sup>	158,9
6	Trung Son hydropower in Thanh Hoa province	1.179,3
7	Hua Na hydropower in Nghe An province	1.433,1

<sup>12</sup>As reported by the report number 303/BC-Committee dated 12/24/2013 of Dak Lak province, the area used for conversion purposes was 2,097 ha of forest, including hydropower projects was 2,085. However, after reviewing the project to change the purpose of forest use since Decree No.23/2006/ND-CP, the Department of Agriculture and Rural Development in Dak Lak province has reported that the area of alternative forest plantation was corrected to 2,064 ha of forest land.

<b>Ref</b>	<b>Hydropower projects</b>	<b>Alternative forests (ha)</b>
8	EVN in Nghe An province	165,6
9	Dak Srong 2 hydropower in Gia Lai province	177,3
10	Ia Hiao hydropower plant, Gia Lai province	108,1
11	Krong H'Nang hydropower in Dak Lak province	112,6
12	Dak G'lun hydropower in Dak Nong province	189,0
13	Dong Nai 3/1 hydropower in Dak Nong province	2.639,8
14	Dong Nai 4/1 hydropower in Dak Nong province	113,5
15	Dong Nai 5/1 hydropower in Dak Nong	213,0
16	Dak N'Teng hydropower in Dak Nong province	101,6
17	Da Khai hydropower in Lam Dong province	101,5
18	Dam Bri hydropower in Lam Dong province	277,9
19	Dong Nai 5 hydropower in Lam Dong province	131,4
20	Song Cho hydropower in Khanh Hoa province	113,6
21	Song Giang hydropower in Khanh Hoa province	161,6
22	Song Tranh 2 hydropower in Quang Nam province	314,0
23	Song Bung 4 hydropower in Quang Nam province	206,6
24	Song Bung 5 hydropower in Quang Nam province	106,4
25	Song Bung 2 hydropower in Quang Nam province	426,2
26	Ba Ha River hydropower in Phu Yen province	204,3

#### Appendix 4. Planted forests after hydropower dam construction

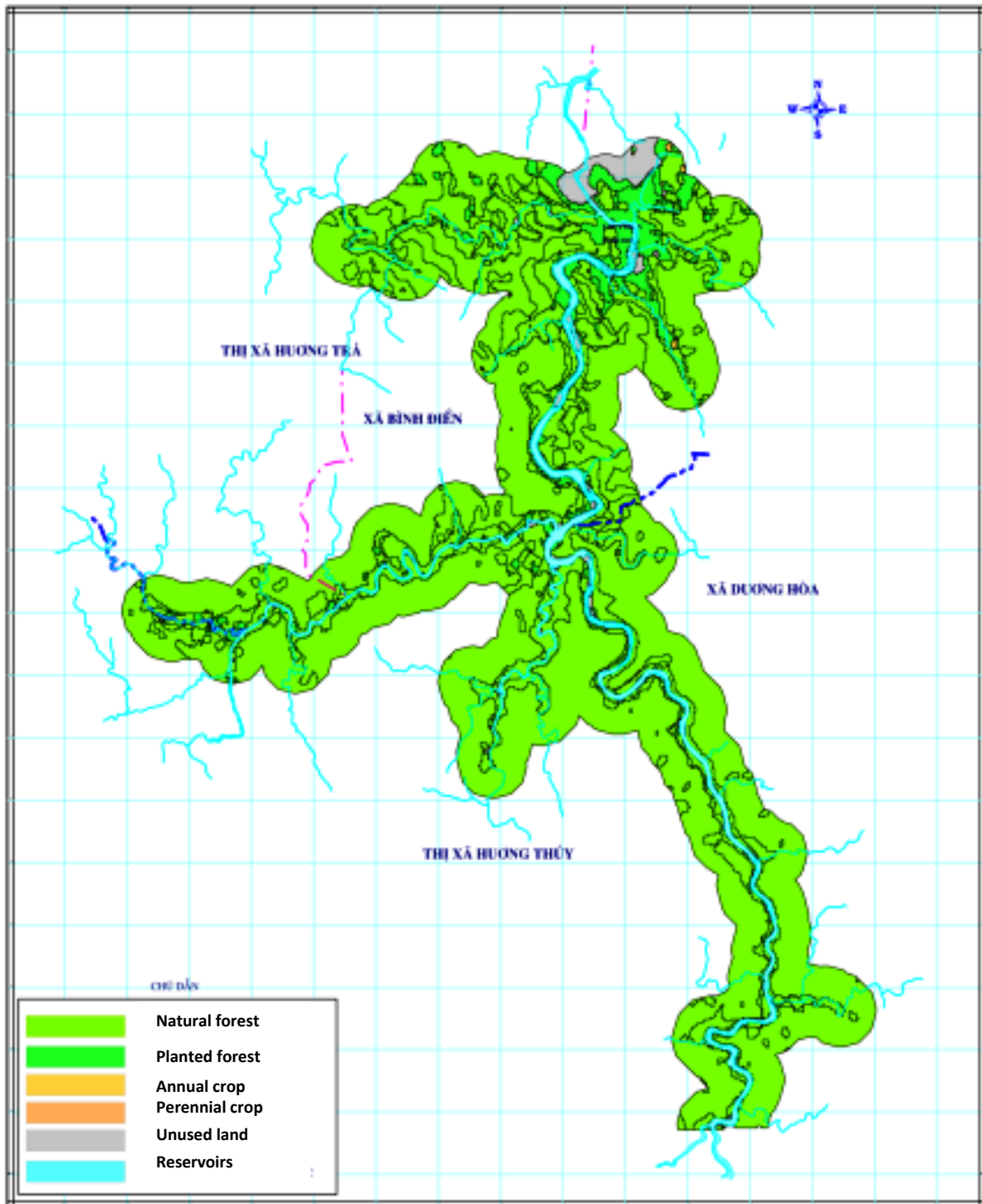
Ref	Provinces	Planned forest plantation area (ha)	Planted up to 10/2015	
			Forest land area (ha)	Compared with initial plans 9ha)
1	Thanh Hoa	662	1650	249.2
2	Lai Chau	1000	1504	150.4
3	Nghe An	1000	1000	100.0
4	Lam Dong	401	697	173.8
5	Dak Nong	1000	396	39.6
6	Gia Lai	667	152	22.8
7	Ha Giang	385	92	23.9
8	Dak Lak	86	69	80.2
9	Lao Cai	67	42	62.7
10	Son La	101	5	5.0
11	Yen Bai	142	2	1.4
	<b>Total</b>	<b>5511</b>	<b>5709</b>	<b>101.8</b>

#### Appendix 5. Provinces that did not plant forests after hydropower dam construction

Ref.	Provinces	Plan to plant alternative forests 2014 (ha)
1	Thua Thien Hue	859
2	Cao Bang	707
3	Khanh Hoa	275
4	Binh Thuan	248
5	Phu Yen	239
6	Lang Son	186
7	Binh Phuoc	184
8	Kon Tum	182
9	Quang Nam	158
10	Ha Tinh	75
11	Quang Tri	71
12	Quang Ngai	51
13	Hoa Binh	33
14	Phu Tho	16
15	Bac Kan	6
	<b>Total</b>	<b>3290</b>

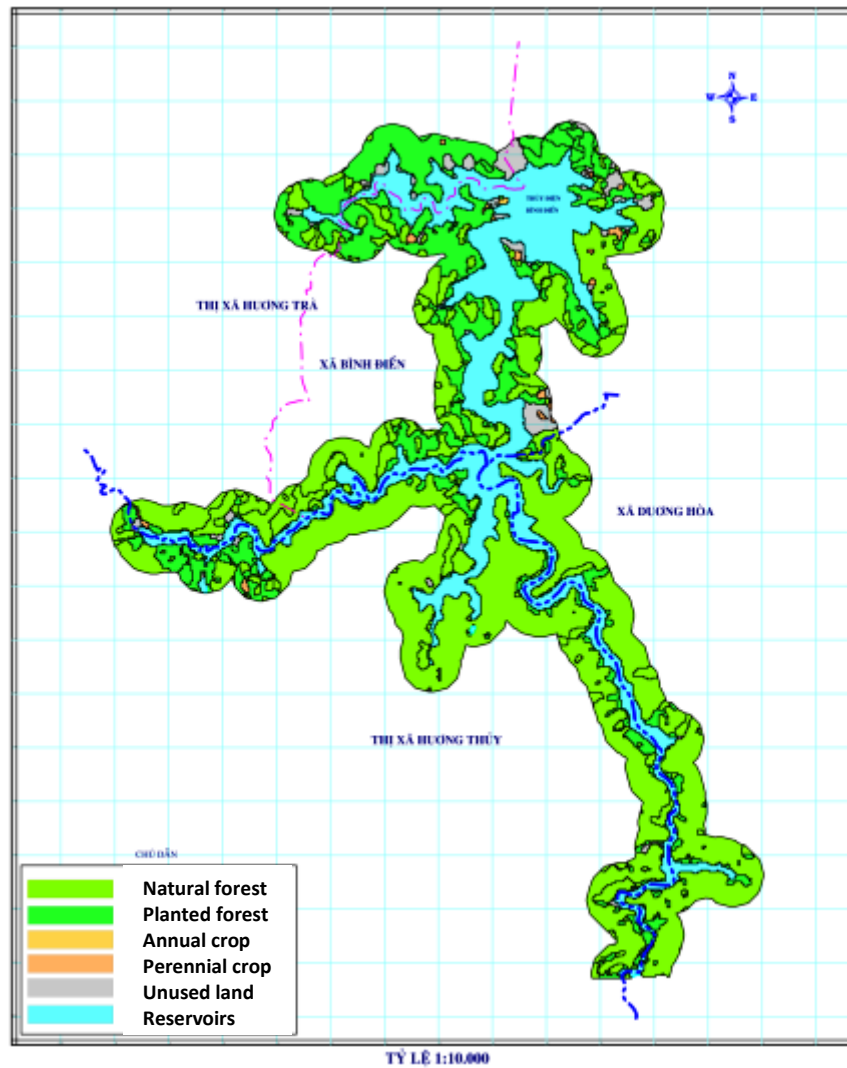
Appendix 6. Forest land change map after building Binh Dien reservoir and 500m-buffer zone

LAND USE MAP OF BINH DIEN HYDROPOWER PLANT IN 2005



Appendix 6. Forest land change map after building Binh Dien reservoir in Thua Thien Hue province

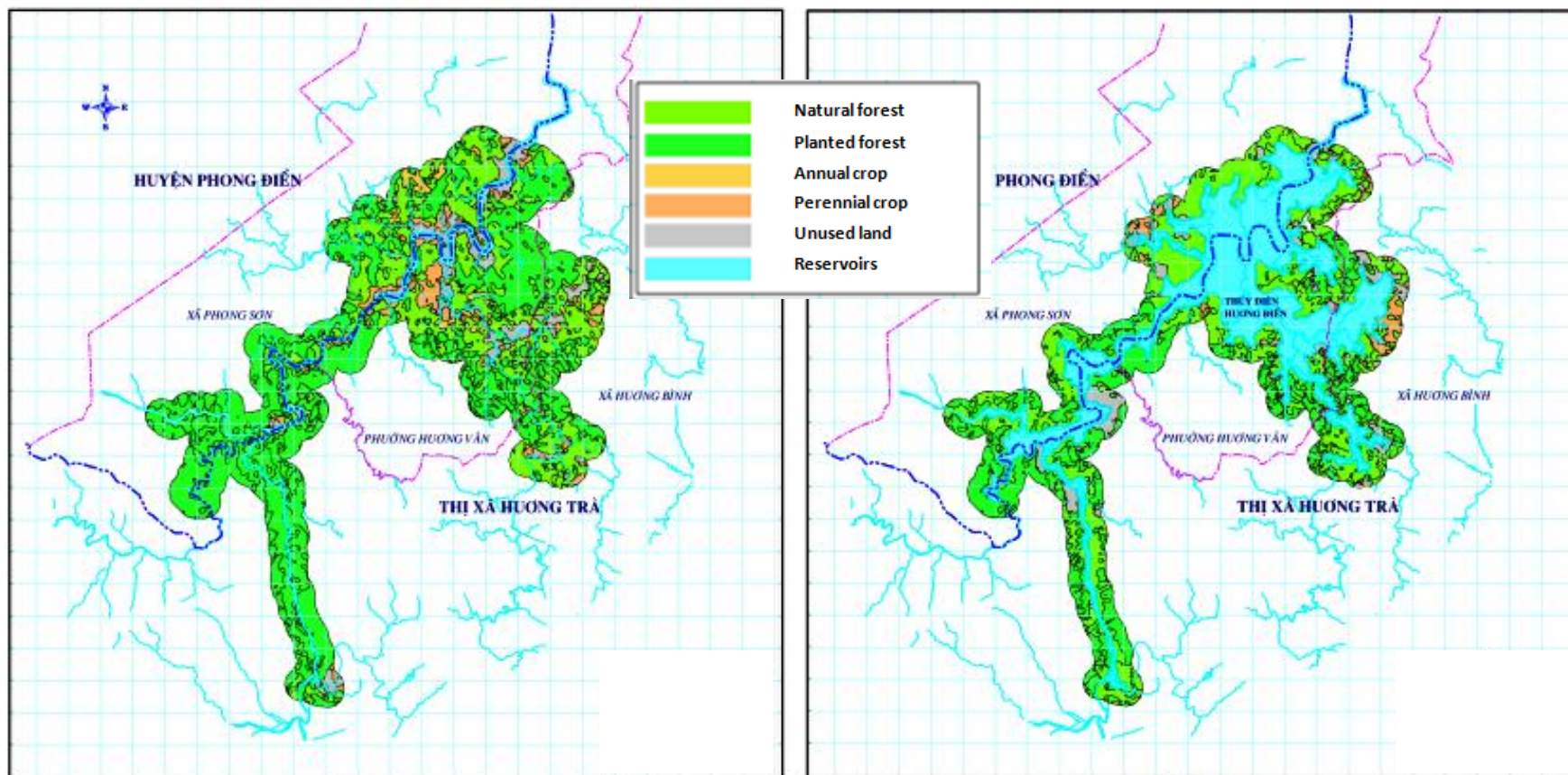
LAND USE MAP OF BINH DIEN HYDROPOWER PLANT  
IN 2015 AFTER CONSTRUCTION



### Appendix 7. Forest land change map after building Huong Dien hydropower dam

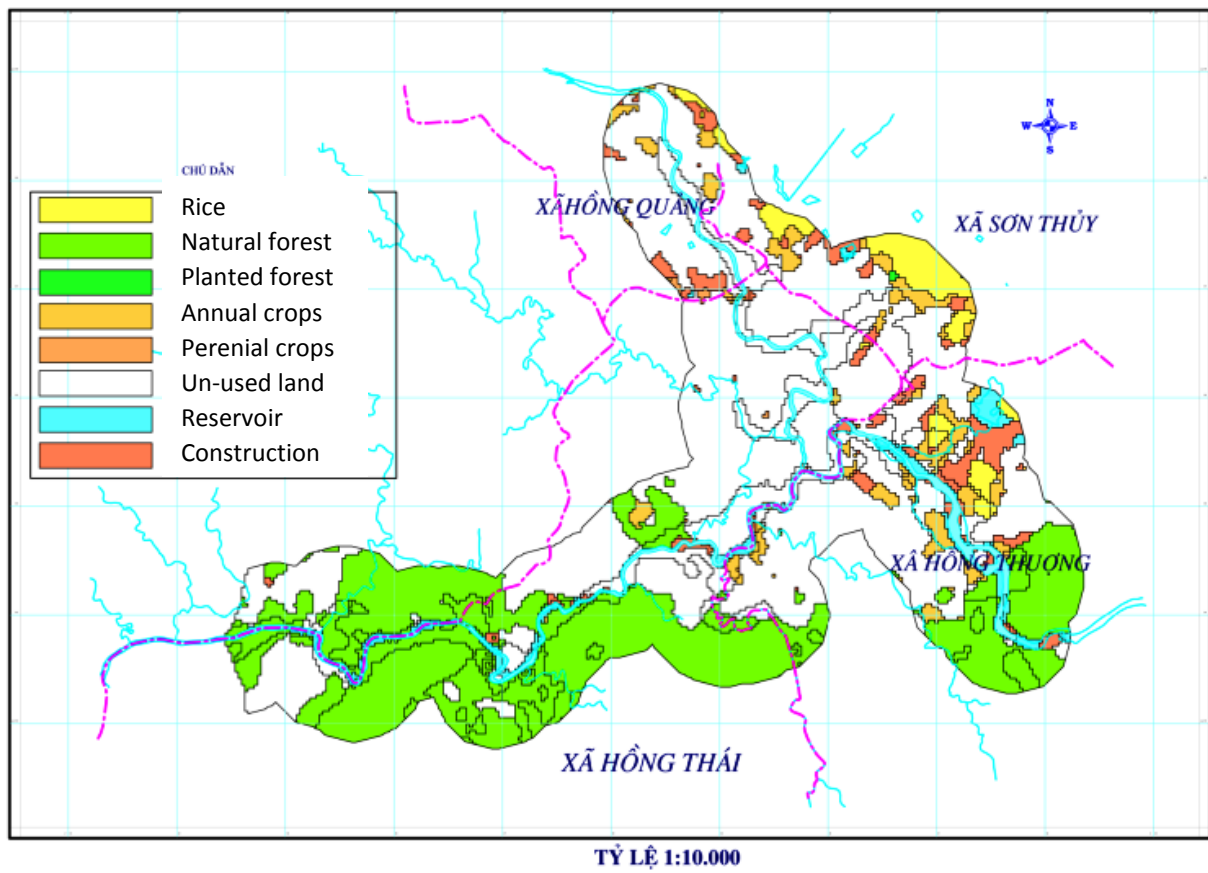
LAND USE MAP OF HUONG DIEN HYDROPOWER PLANT IN 2005

LAND USE MAP OF HUONG DIEN HYDROPOWER PLANT IN 2015 AFTER CONSTRUCTION

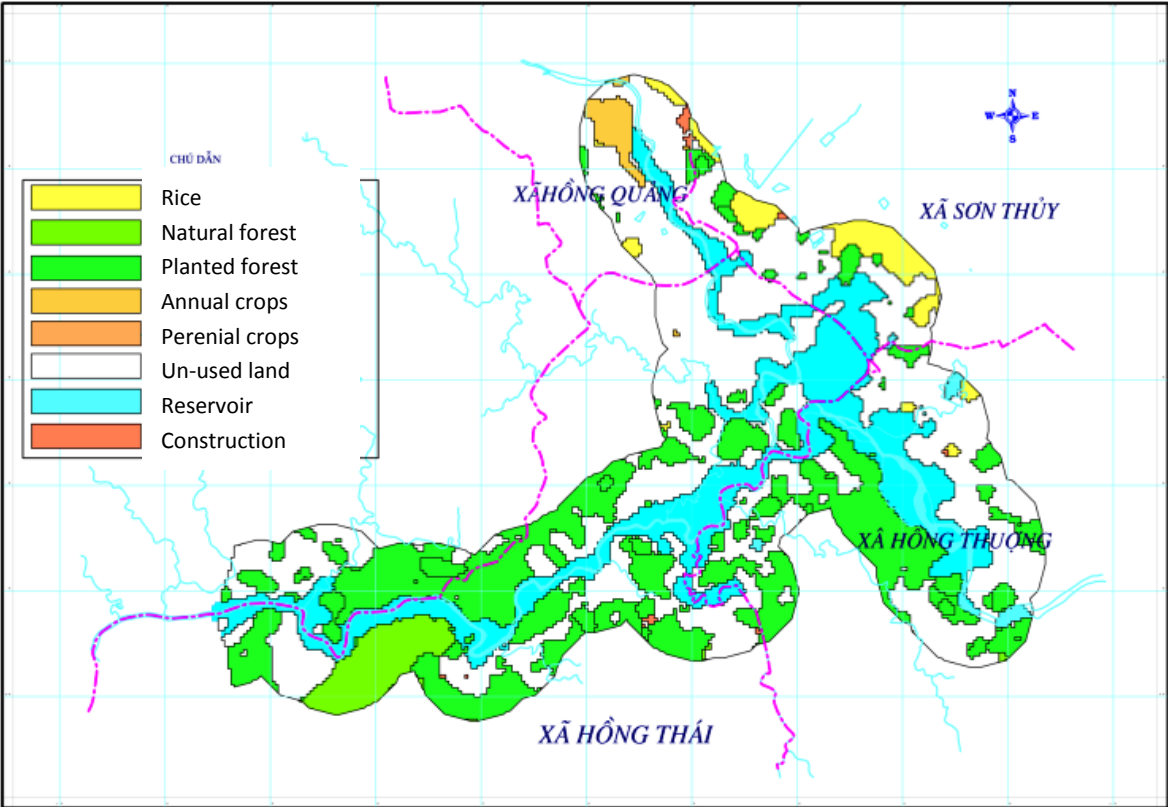


**Appendix 8. Forest land change map after building A Luoi reservoir**

**LAND USE MAP OF A LUOI HYDROPOWER PLANT IN 2005**



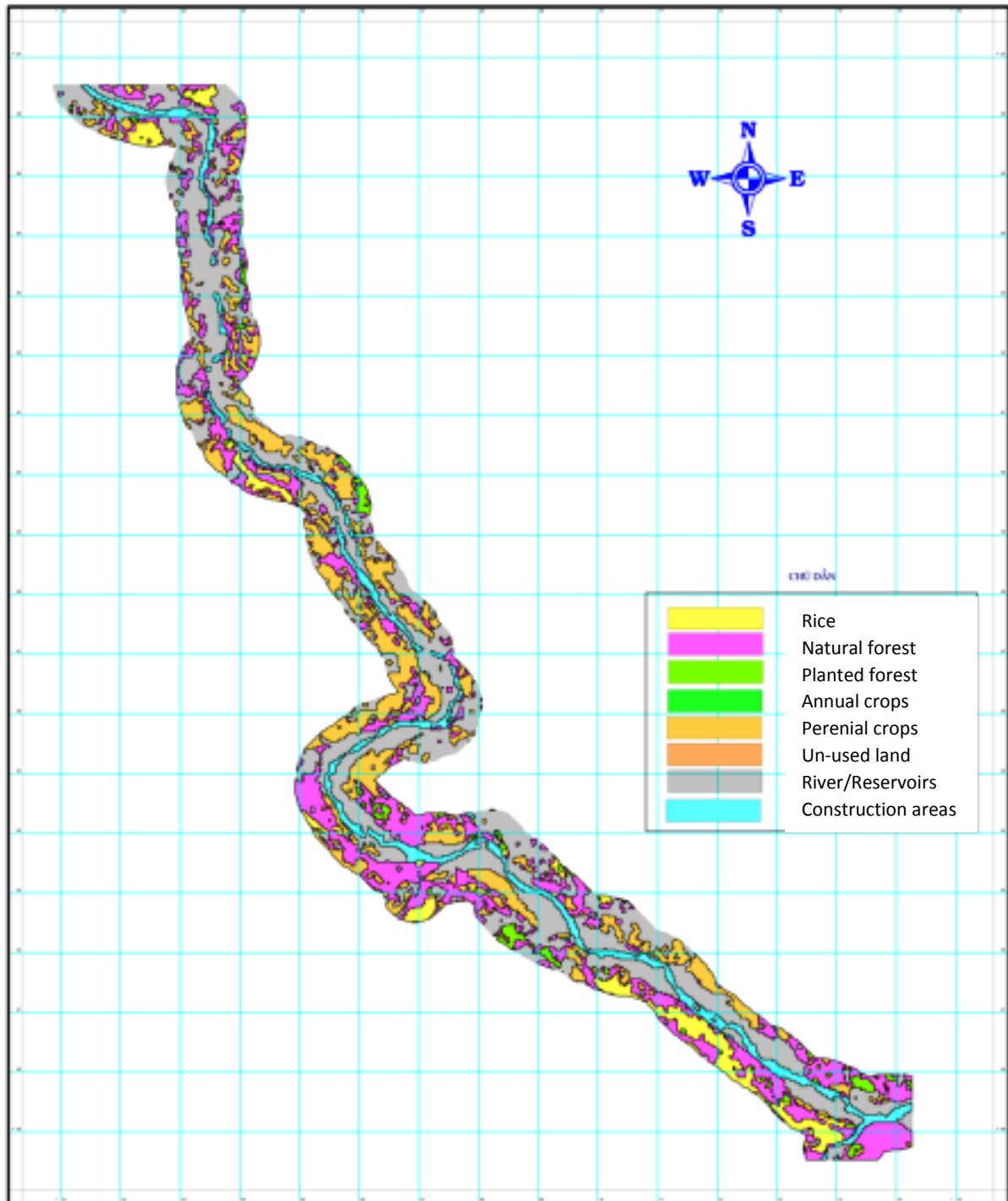
LAND USE MAP OF A LUOI HYDROPOWER PLANT IN 2015 AFTER CONSTRUCTION





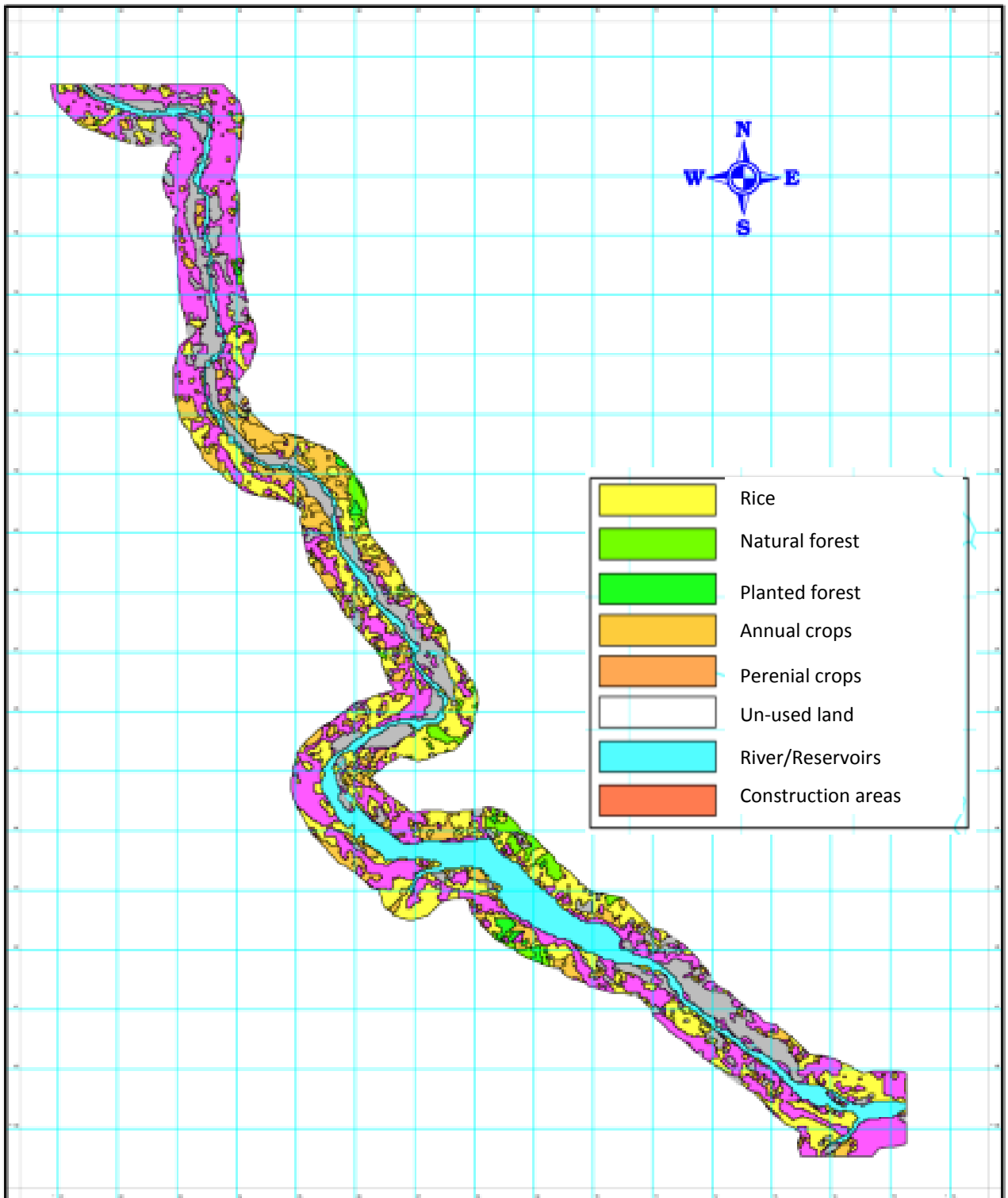
Appendix 9. Forest land change map after building Van Phong reservoir

LAND USE MAP OF VAN PHONG HYDROPOWER PLANT IN 2001 IN BINH DINH PROVINCE



TỶ LỆ 1:25,000

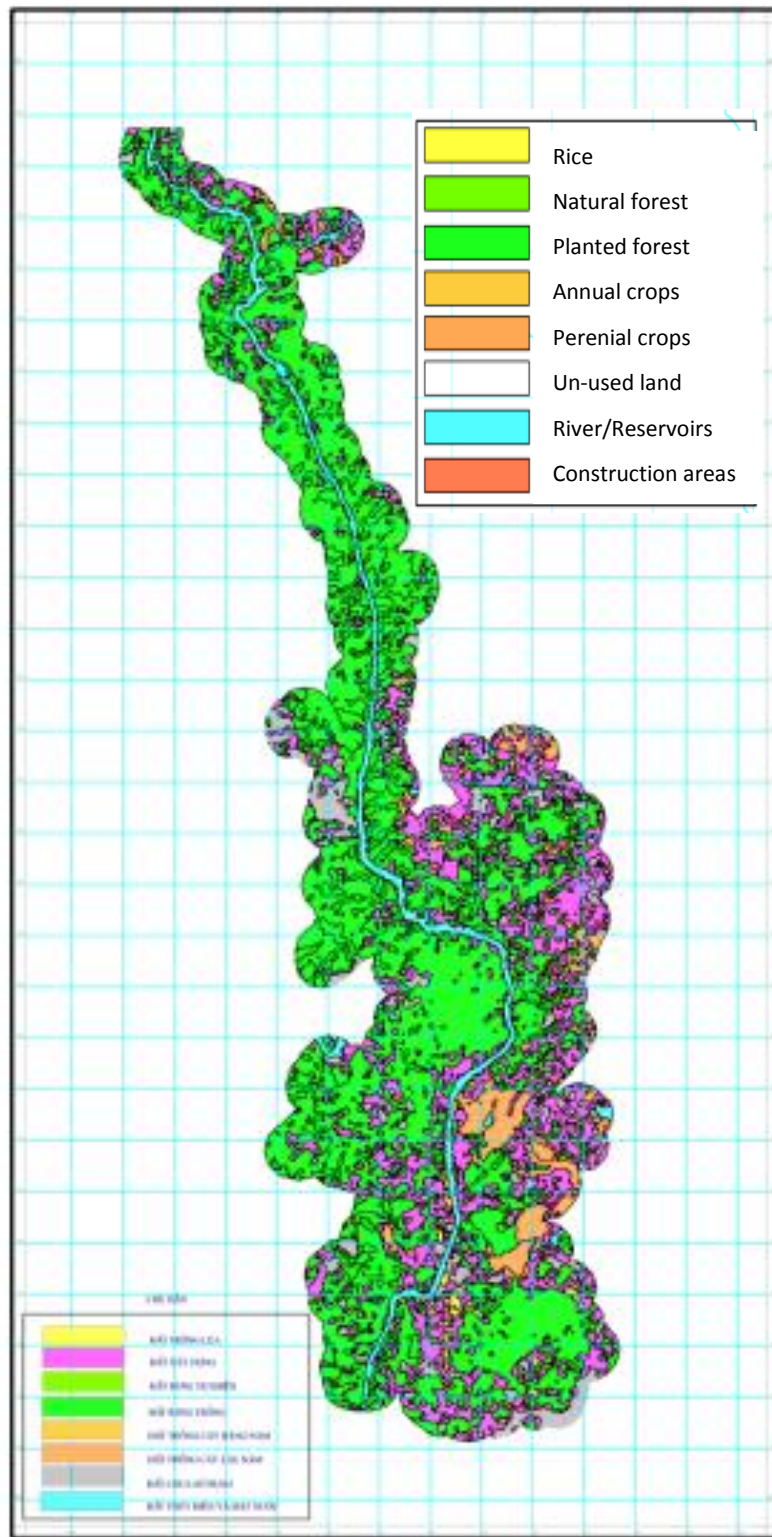
**LAND USE MAP OF VAN PHONG HYDROPOWER PLANT IN 2015  
AFTER CONSTRUCTION IN BINH DINH**



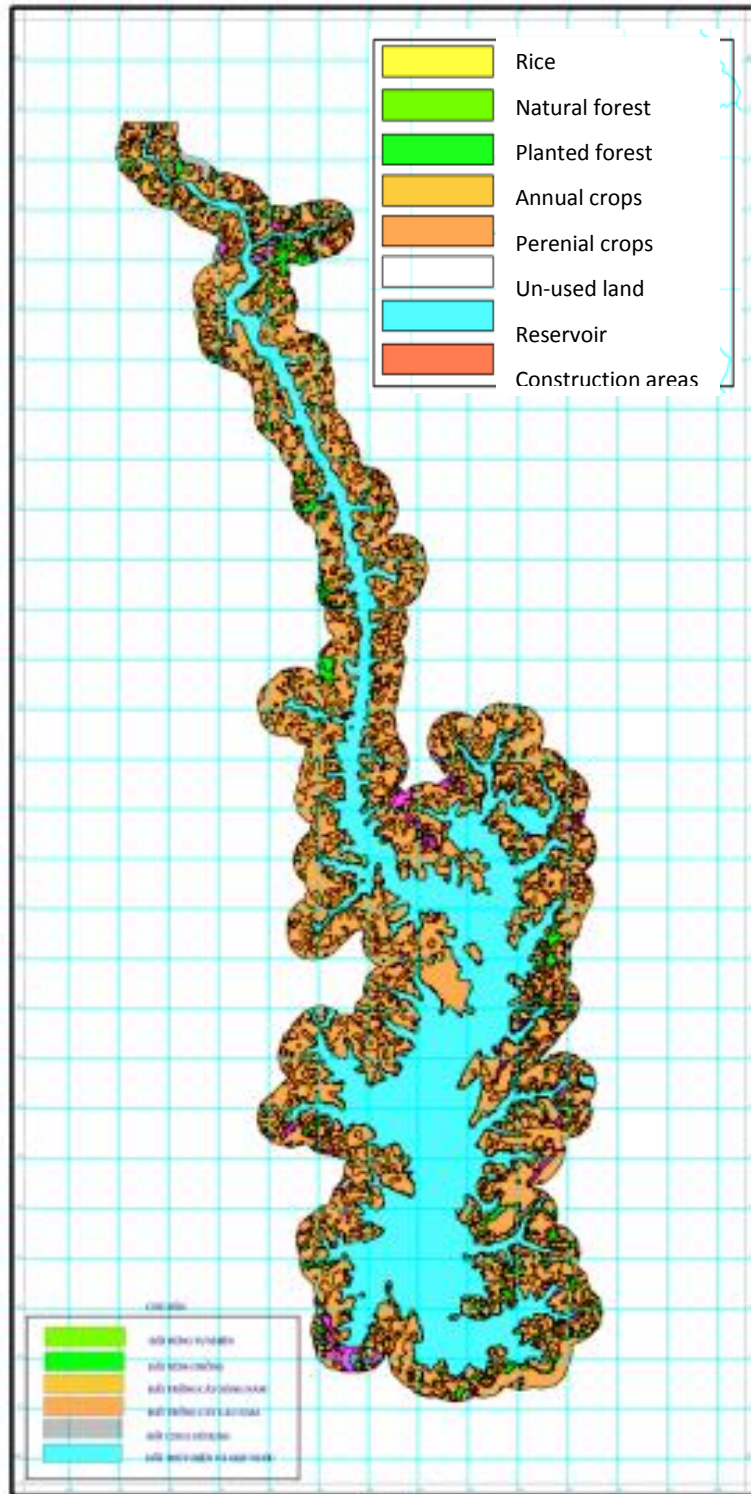
TỶ LỆ 1:25.000

Appendix 10. Forest land change map after building Pleikrong reservoir

LAND USE MAP OF PLEIKRONG HYDROPOWER PLANT IN 2001 IN KONTUM PROVINCE

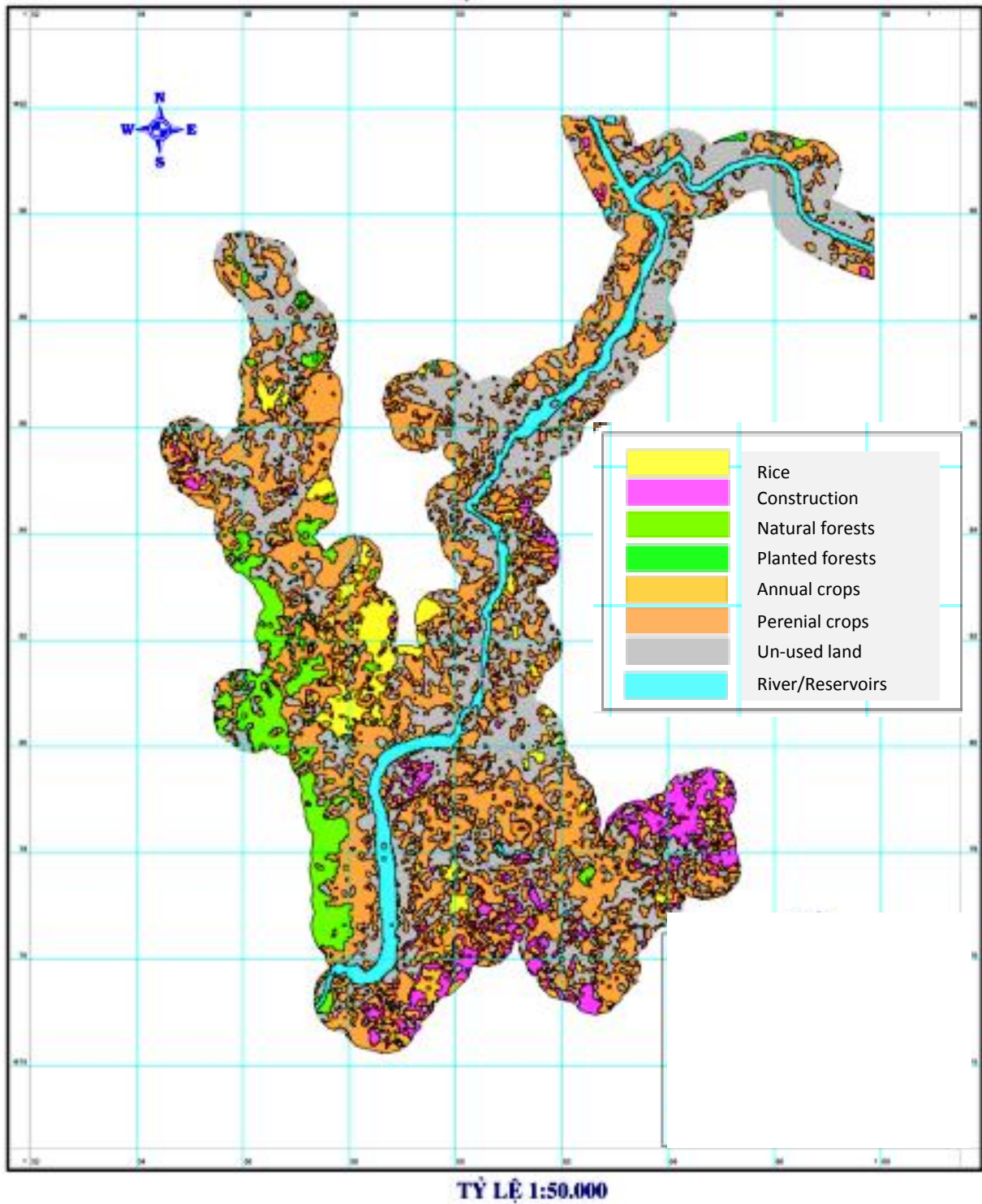


## LAND USE MAP OF PLEIKRONG HYDROPOWER PLANT IN 2015 AFTER CONSTRUCTION IN KONTUM PROVINCE

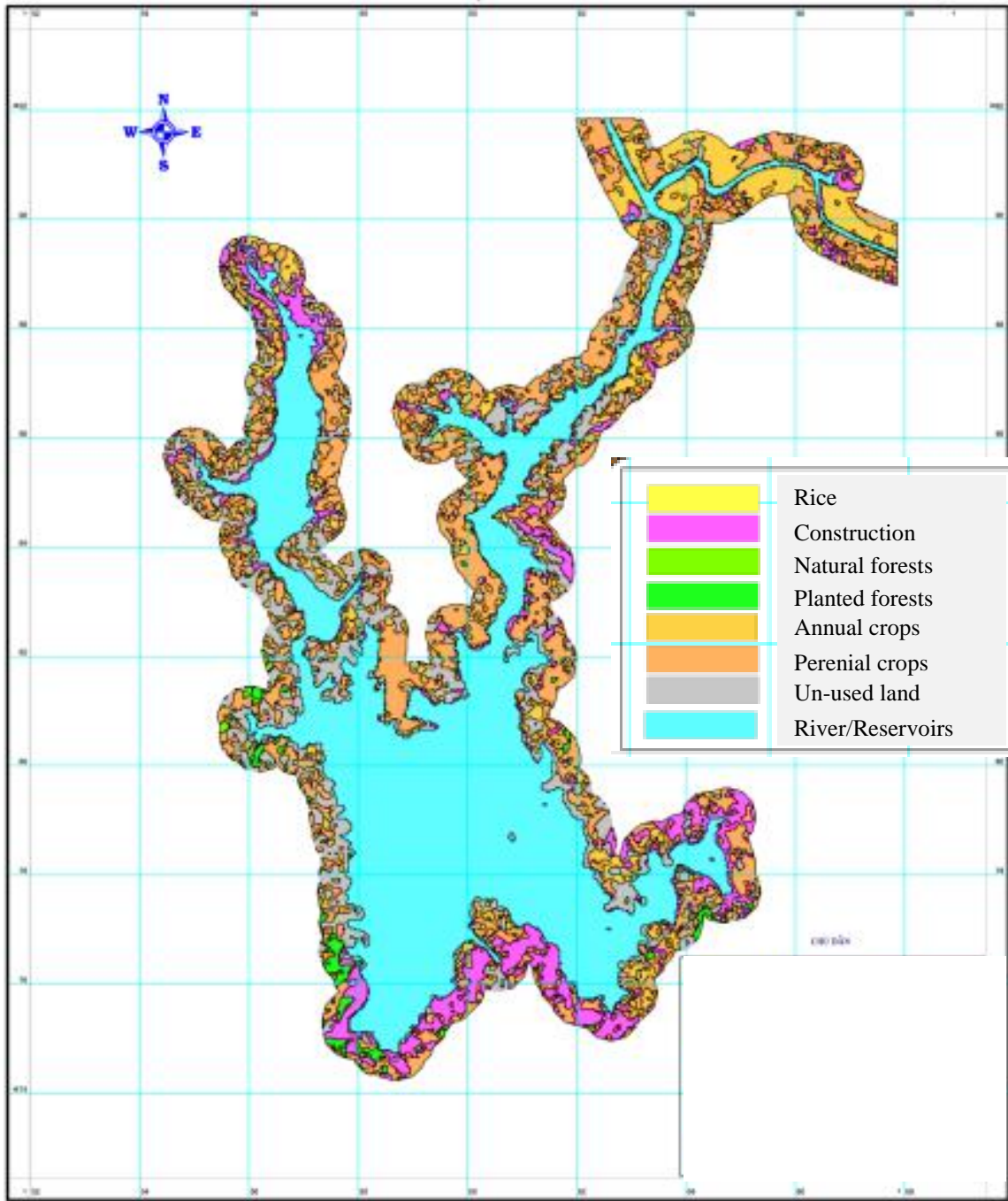


Appendix 11. Forest land change map after building Yali reservoir

LAND USE MAP OF YALI HYDROPOWER PLANT IN 1990 IN GIA LAI PROVINCE

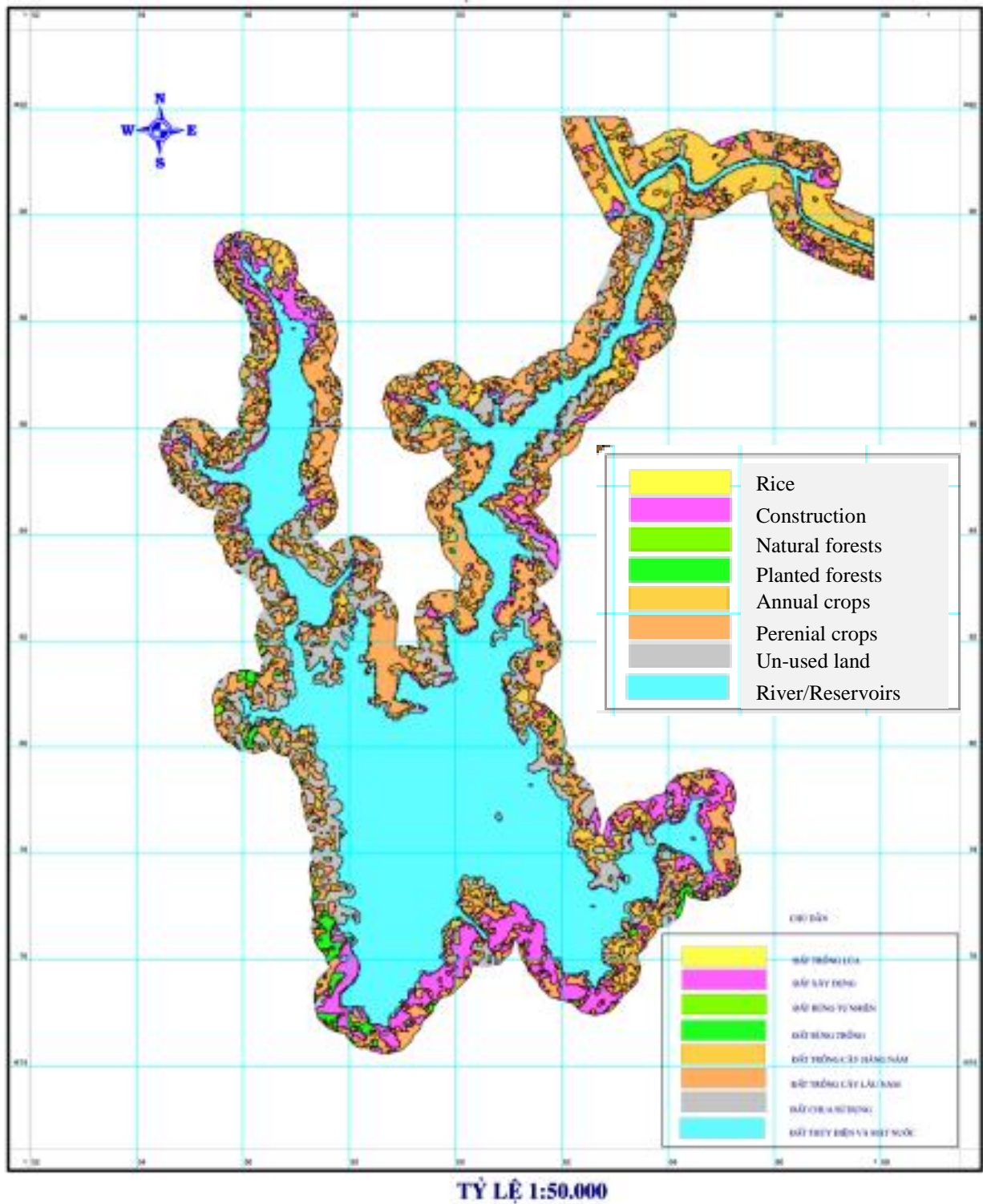


**LAND USE MAP OF YALI HYDROPOWER PLANT IN 2015  
AFTER CONSTRUCTION IN GIA LAI PROVINCE**

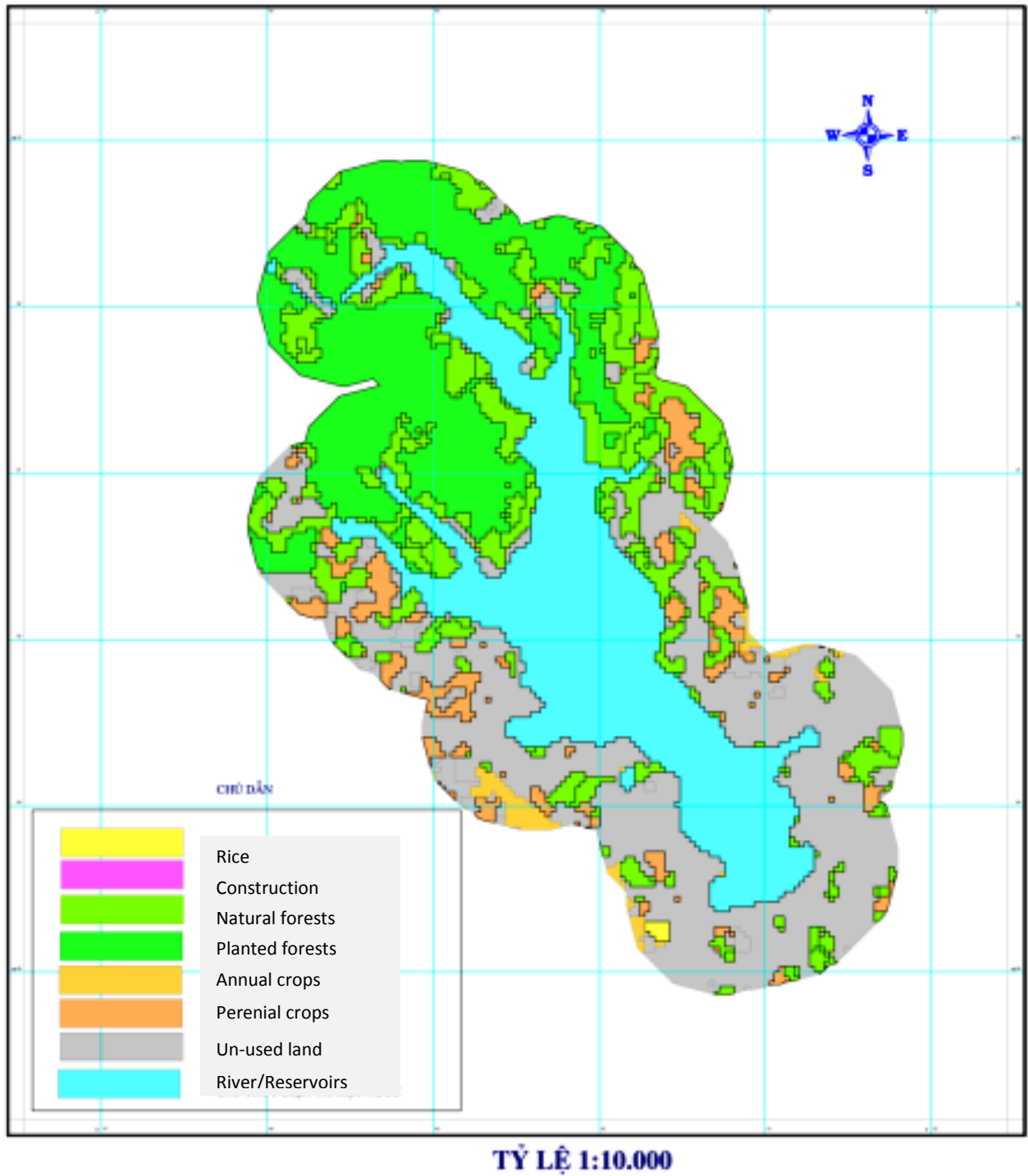


**TỶ LỆ 1:50.000**

**Appendix 12. Forest land change map after building Vinh Son reservoir**

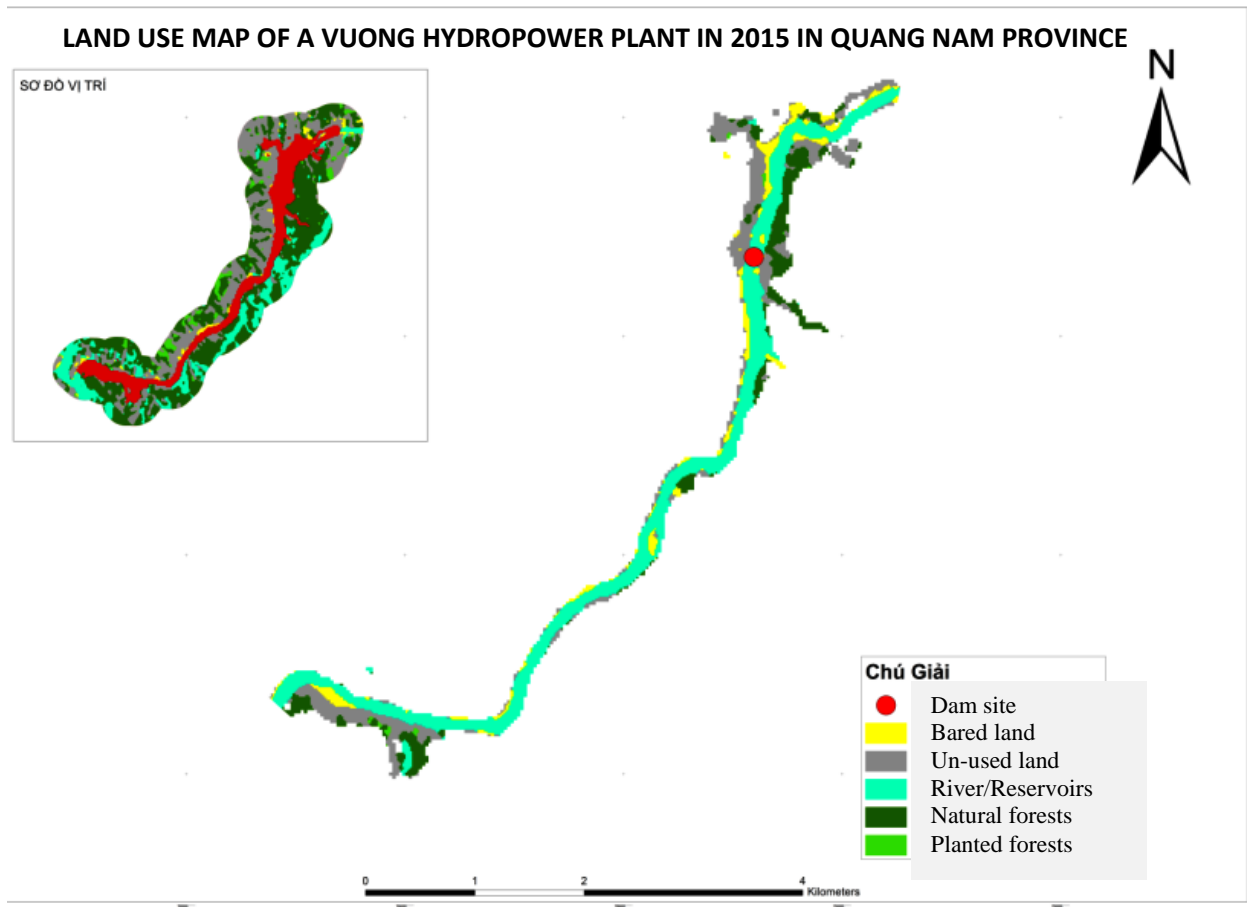


# LAND USE MAP OF VINH SON HYDROPOWER PLANT IN 2015 IN BINH DINH PROVINCE

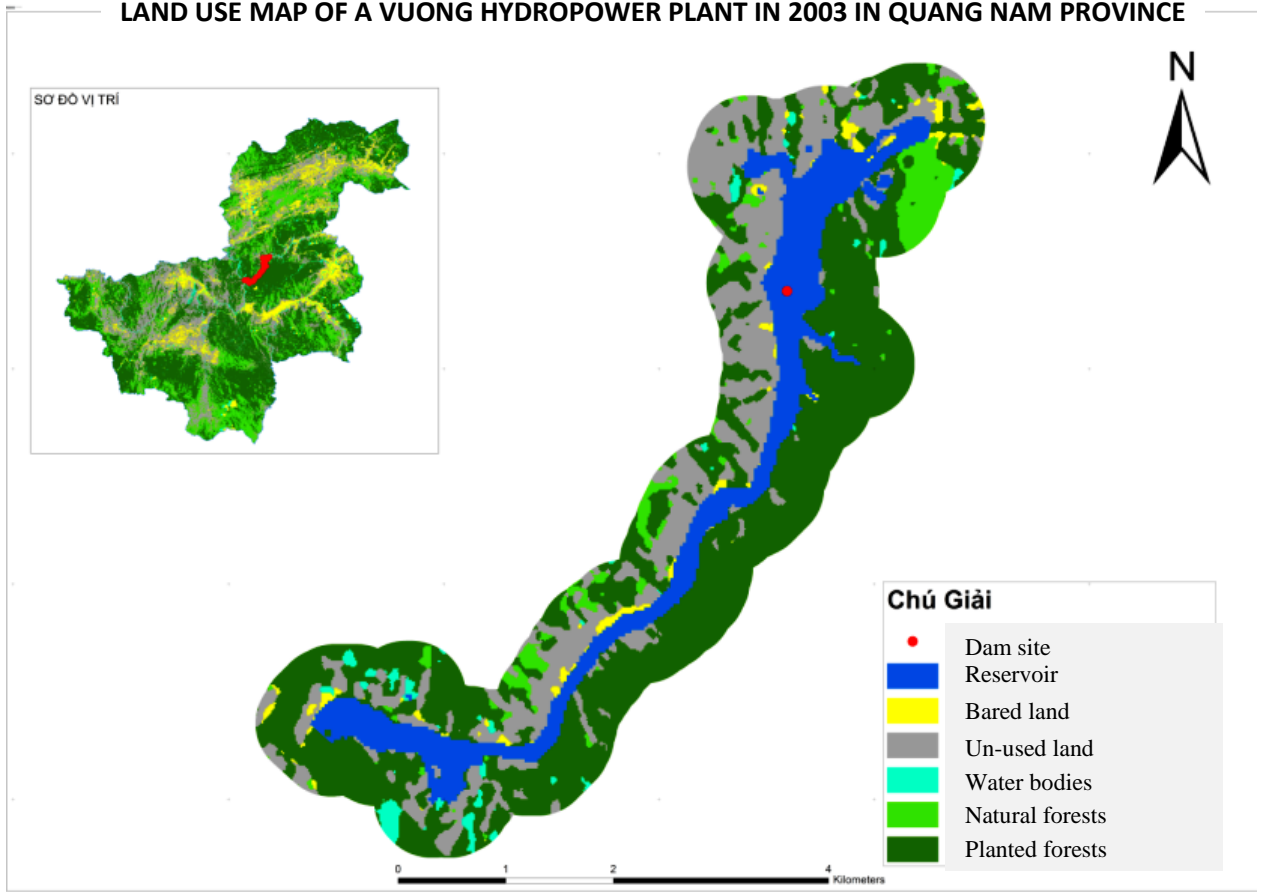




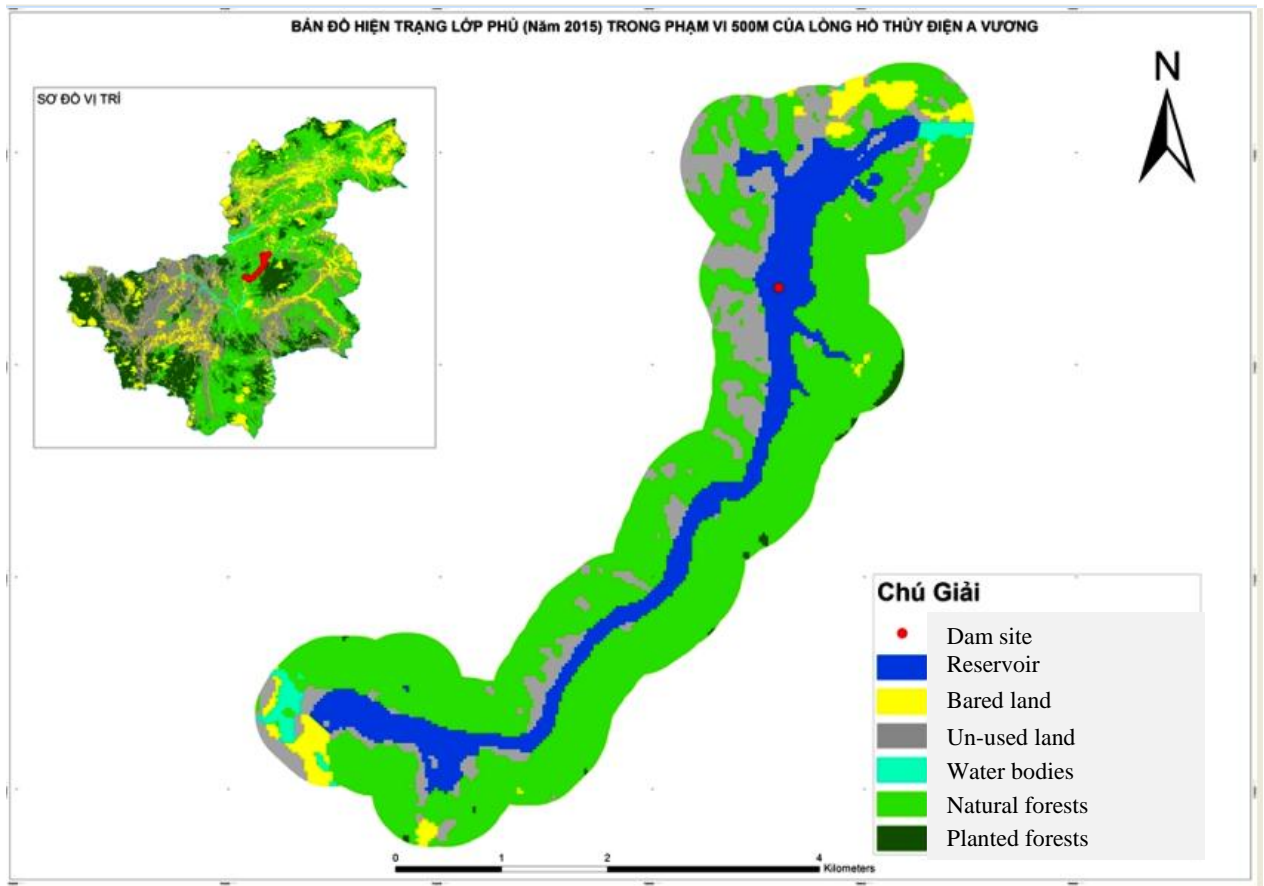
### Appendix 13. Forest land change map after building A Vuong reservoir



LAND USE MAP OF A VUONG HYDROPOWER PLANT IN 2003 IN QUANG NAM PROVINCE

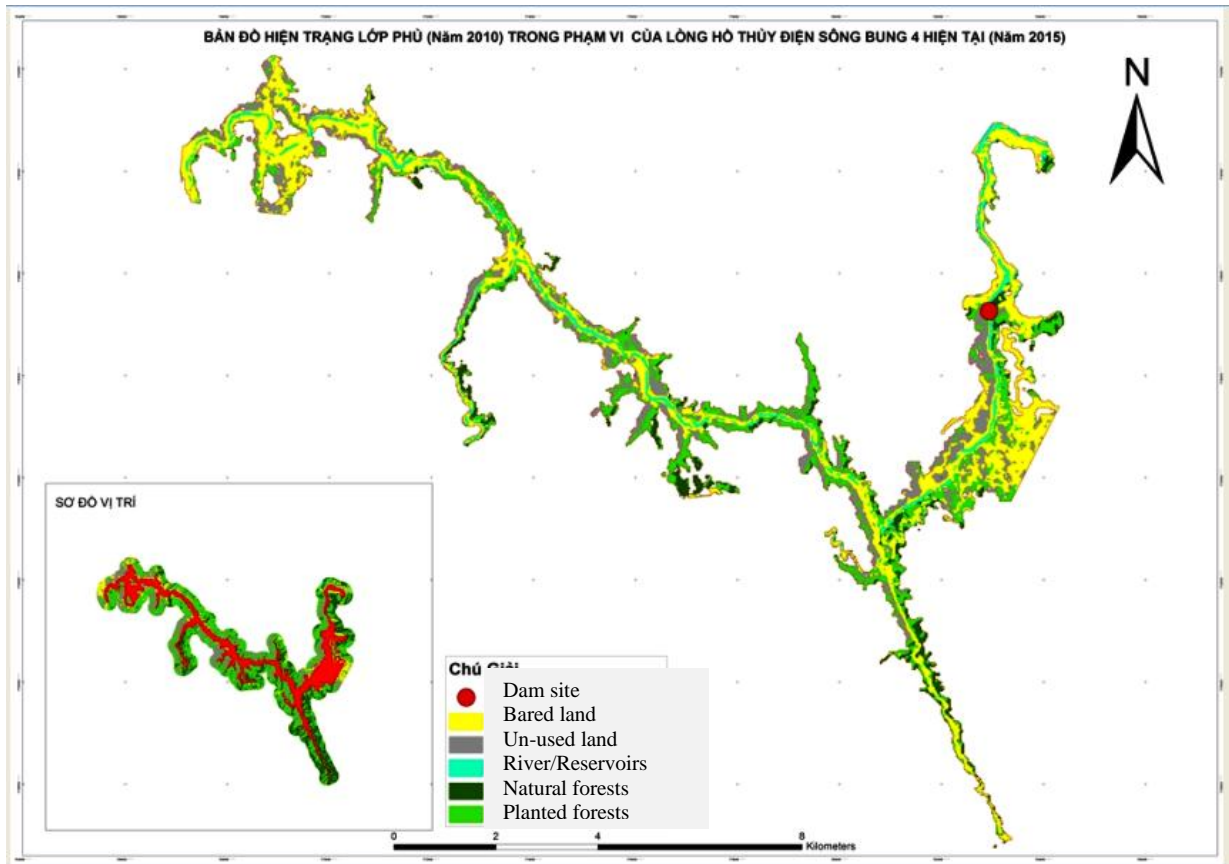


BẢN ĐỒ HIỆN TRẠNG LỚP PHŨ (Năm 2015) TRONG PHẠM VI 500M CỦA LỒNG HỒ THỦY ĐIỆN A VƯƠNG

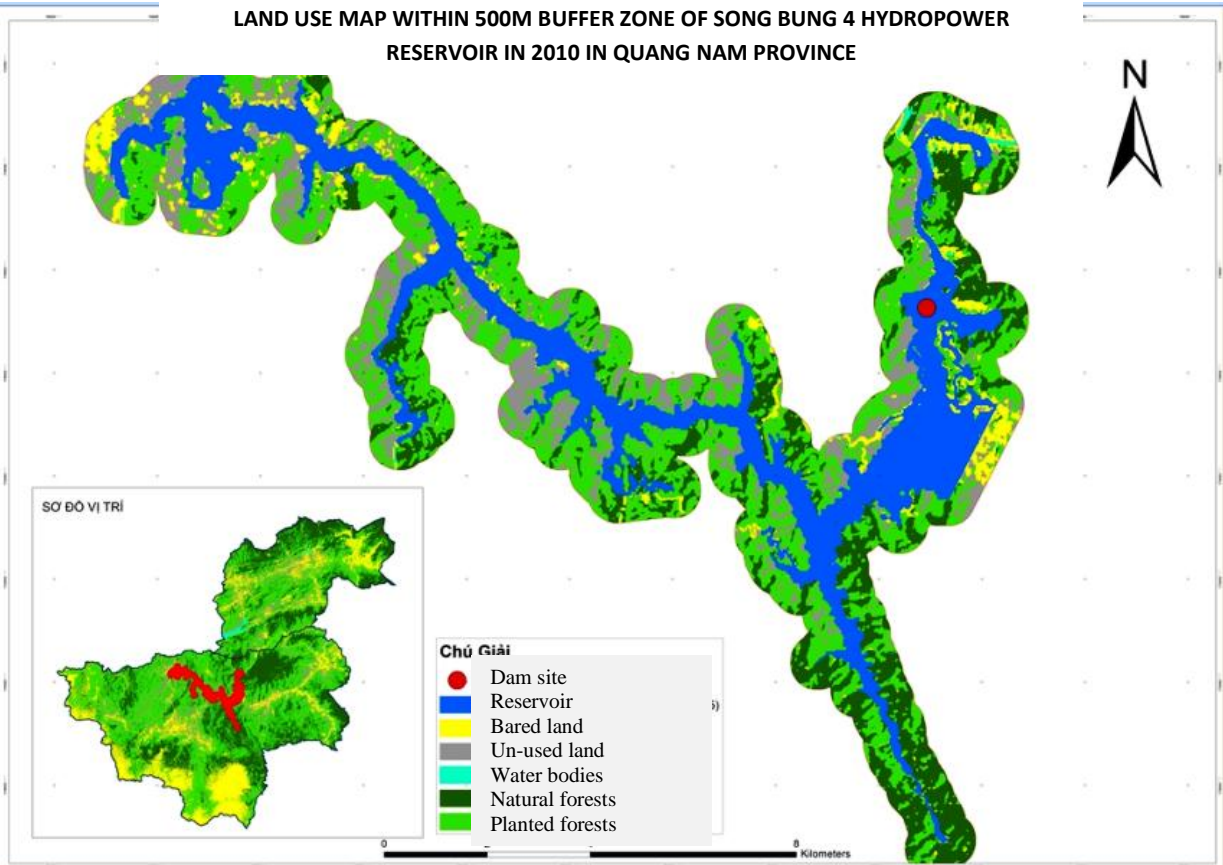


## Appendix 14. Forest land change map after building Song Bung 4 reservoir

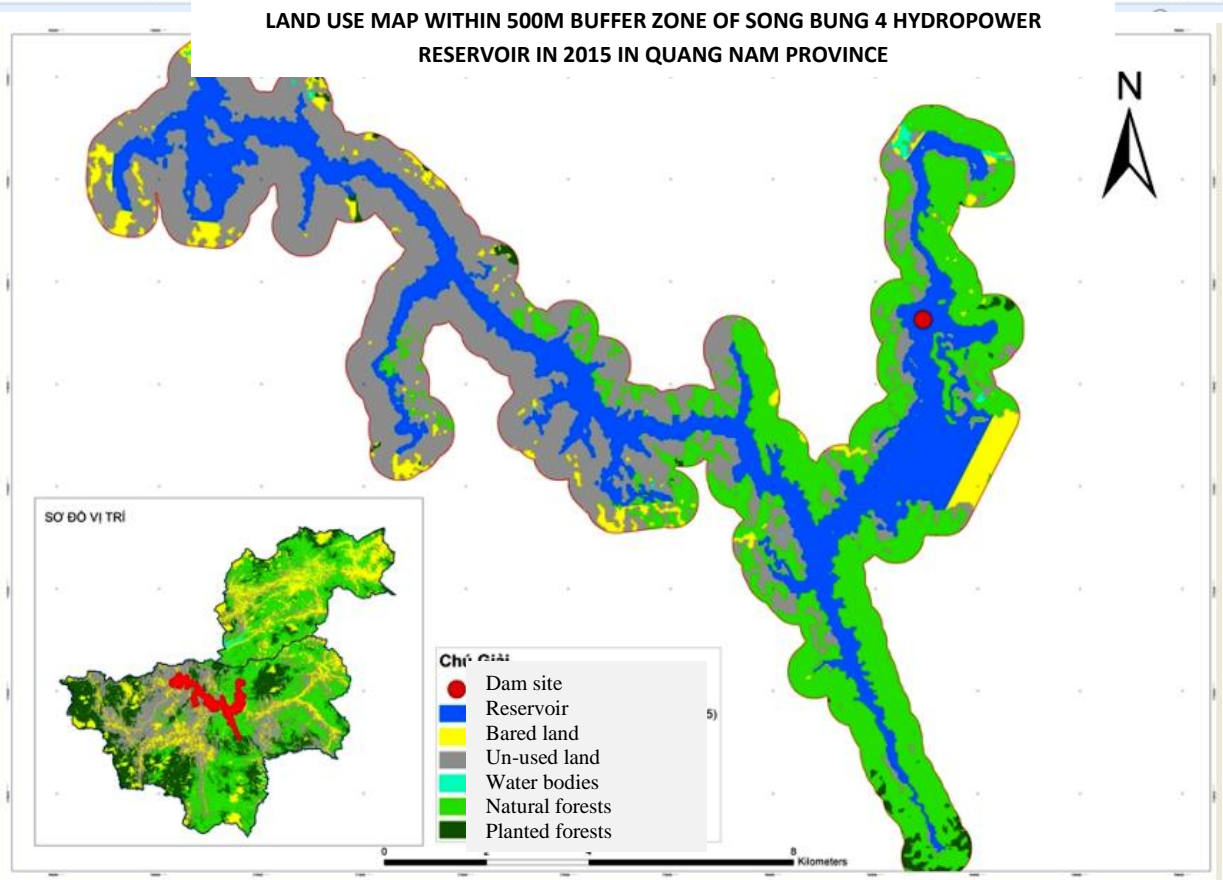
### LAND USE MAP OF SONG BUNG 4 WITHIN 500M BUFFER ZONE OF RESERVOIR IN 2015



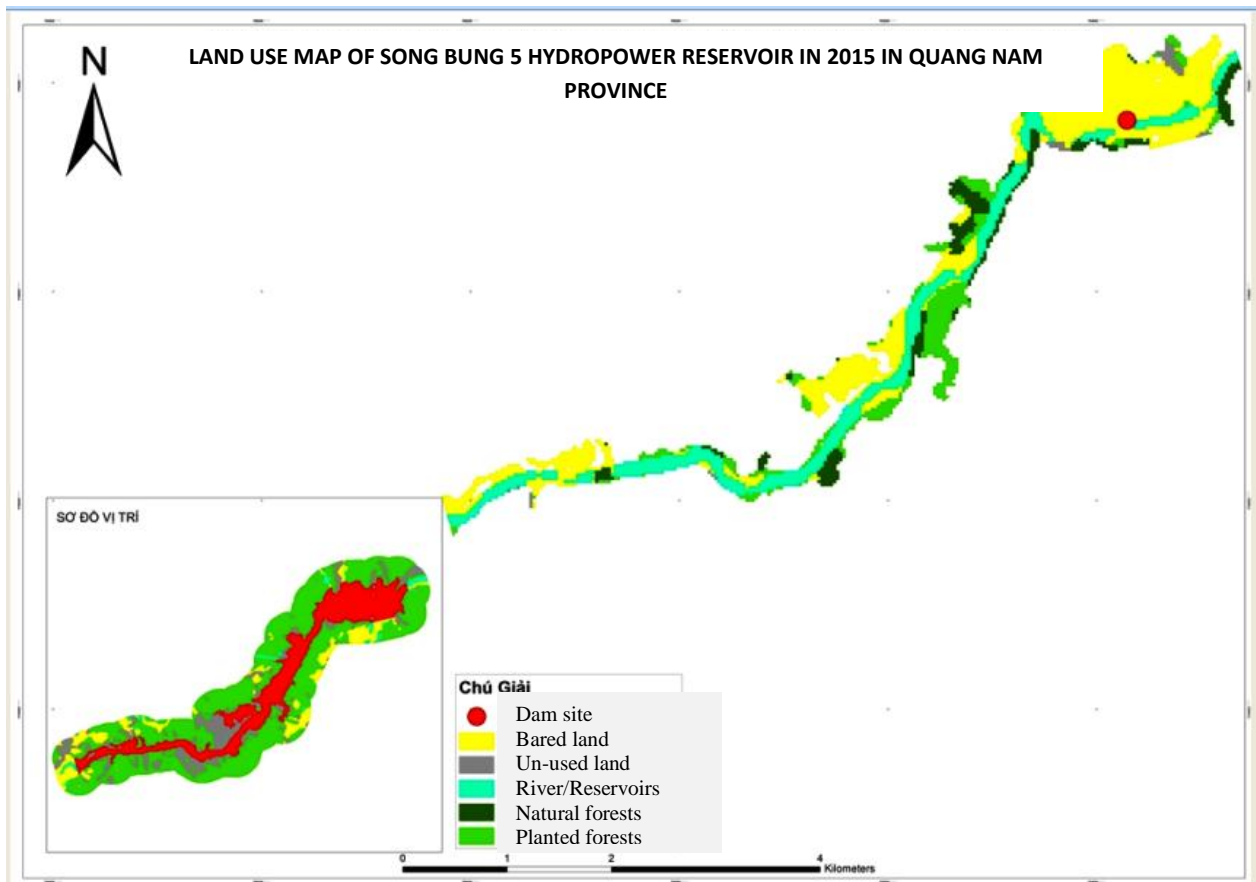
LAND USE MAP WITHIN 500M BUFFER ZONE OF SONG BUNG 4 HYDROPOWER RESERVOIR IN 2010 IN QUANG NAM PROVINCE



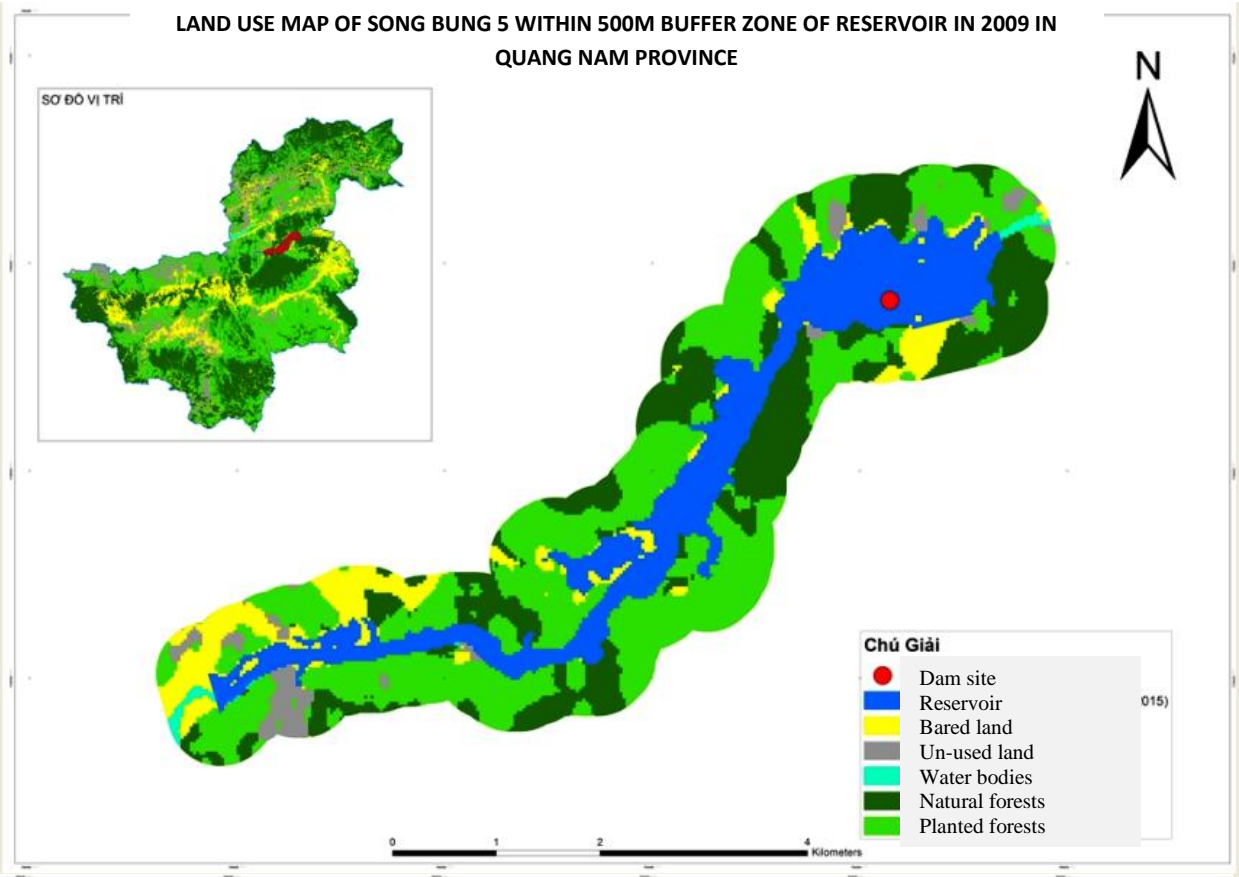
LAND USE MAP WITHIN 500M BUFFER ZONE OF SONG BUNG 4 HYDROPOWER RESERVOIR IN 2015 IN QUANG NAM PROVINCE



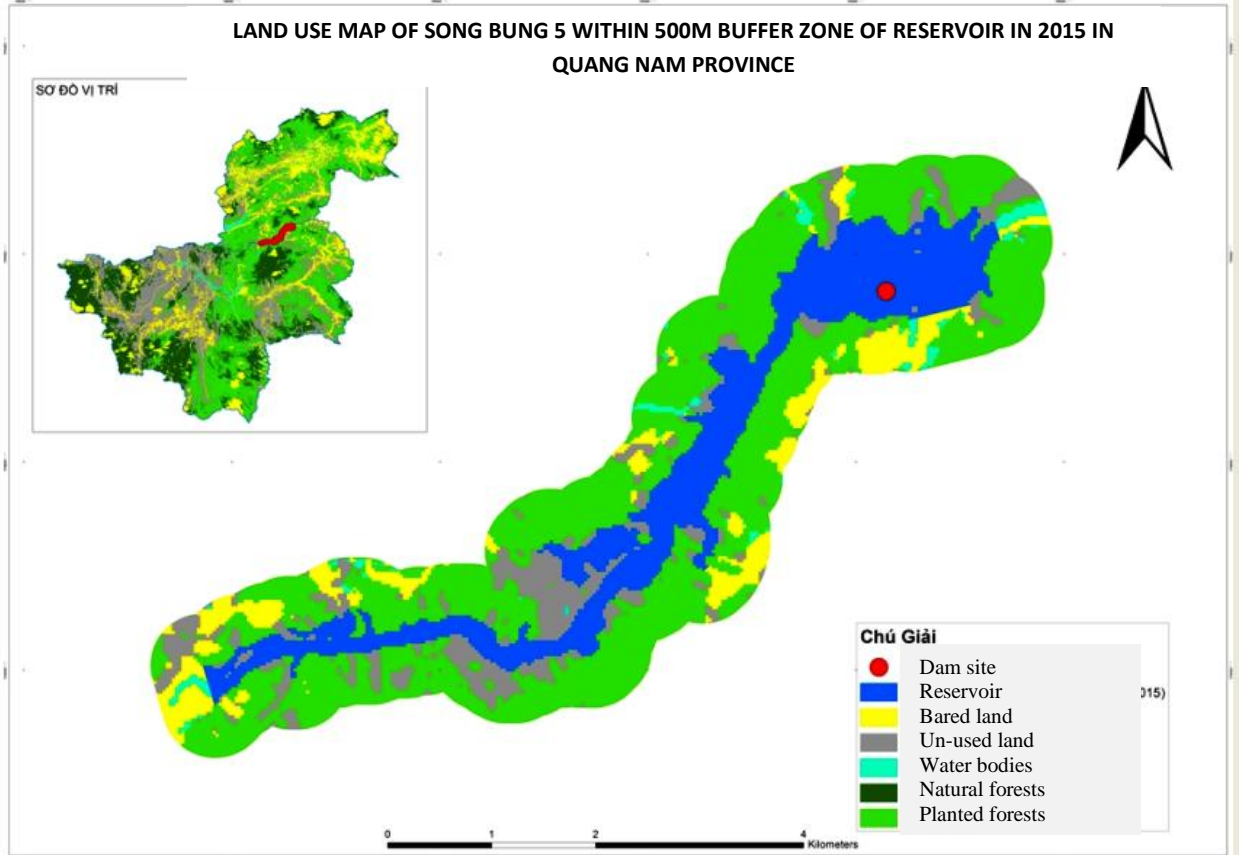
### Appendix 15. Forest land change map after building Song Bung 5 reservoir



LAND USE MAP OF SONG BUNG 5 WITHIN 500M BUFFER ZONE OF RESERVOIR IN 2009 IN QUANG NAM PROVINCE



LAND USE MAP OF SONG BUNG 5 WITHIN 500M BUFFER ZONE OF RESERVOIR IN 2015 IN QUANG NAM PROVINCE



### Appendix 16. List of participants of the workshop on alternative forest planting policy

Ref	Full name	Position	Institutions
1	Vuong Son Ba	Staff	Department of Agriculture and Rural Development (DARD) in Khanh Hoa province
2	Vo Quang Canh	Staff	Sub-department of forestry in Khanh Hoa province
3	Dinh Ngoc Quang	Deputy director	Fund of forest protection and development (FFPD) in Khanh Hoa province
4	Tran Phuc Kham	Vice-office head	Khanh Hoa Department of planning and investment
5	Tran An	Vice-office head	DARD in Binh Dinh province
6	Nguyen Hoai Thanh	Staff	Sub-department of forestry in Khanh Hoa province
7	Nguyen The Dung	Head	Sub-department of forestry in Binh Dinh province
8	Nguyen Duc Chien	Vice-head	FFPD in Binh Dinh province
9	Ngo Anh Tu	Vice-dean	Quy Nhon university
19	Nguyen Huu Xuan	Dean	Quy Nhon university
11	Ha Van Duc	Head	Sub-department of land management in Binh Dinh province
12	Huynh Van Toan	Head of office	Office for land registration in Binh Dinh province
13	Dang Cong Binh	Deputy director	Office for land registration in Binh Dinh province
14	Dang Le Huu Phuoc	Team leader	Office for land registration in Binh Dinh province
15	Nguyen Hong Lam	Staff	Sub-department of forestry in Gia Lai province
16	Vu Ngoc An	Deputy director	DARD in Gia Lai province
17	Nguyen Xuan Thuong	Head office	DARD in Gia Lai province
18	Tran Thi Le Hoa	Head office	DARD in Gia Lai province
19	Ho Minh Hoang	Director	FFPD in Kon Tum province
20	Nguyen Minh Quan Cuong	Staff	DARD in Kon Tum province
21	Ho Cong Vu	Staff	Sub-department of forestry in Kon Tum province
22	Nguyen Van Binh	Head office	Sub-department of forestry in

			Quảng Nam province
23	Mai Tan Len	Director	FFPD in Phu Yen province
24	Ton That Thinh	Deputy director	FFPD in Phu Yen province
25	Nguyen Duy Tuan	Head office	FFPD in Phu Yen province
26	Huynh Van Chuong	Vice rector	Hue University of Agriculture and Forestry
27	Pham Huu Ty	Principle researcher	Hue University of Agriculture and Forestry
28	Tran Huu Nghi	Director	Tropenbos International
29	Nguyen Quynh Thu	Staff	Tropenbos International
30	Ha Thi Tu Anh	Staff	Tropenbos International
31	Nguyen Van Hoa	Staff	Tropenbos International



## Appendix 17. Agenda of the workshop on alternative forest planting policy

**Time:** 26 December 2015

**Place:** Quy Nhon hotel, Quy Nhon city, Dinh Binh province, Viet Nam

Time	Activities	Facilitators
7:30 - 8:00	Reception	Organizers
8:00 - 8:05	Opening	Dr. Pham Huu Ty
8:15 - 8:30	Watching a video documenting the situation of alternative forest plantation by Viet Nam Television 1	Dr. Pham Huu Ty
8:30 - 8:45	Presentations on the situation and solutions for planting alternative forest plantation in some provinces in Central Viet Nam	Staffs in provinces
8:45 - 9:00	Presentation of research team on the initial findings of the study	Dr. Pham Huu Ty
9:00 - 9:15	Tea break	
9:15 - 10:15	Discussions on topics: - Topic 1: Identifying inappropriate provisions specified in the circulars, directives, and instructions for planting replacement after conversion purposes; and proposing to modify the proposed regulations aims to facilitate the implementation more favorable conditions to local agencies to implement - Topic 2: Discussing on land issues relating to policy of alternative forest planting programmes in localities; and proposing possible solutions to promote progress - Topic 3: Issues of governance, including the participation of local people, relevant stakeholders, coordination, transparency, fairness, sustainability	Group work - Topic 1: Facilitators Nguyen Quynh Thu and Ha Thi Tu Anh - TBI  - Topic 2: Facilitator Huynh Van Chuong  - Topic 3: Facilitator Dr Pham Huu Ty
10:15 - 11:15	Group reporting	Representatives of groups
11:15 - 11:45	General discussion	All participants
11:45 - 12:00	Closing	Dr. Pham Huu Ty
12:00 - 14:00	Lunch	All participants

## Appendix 18. Workshop photos



Presentation of local staff



Participants of the workshop



Sharing lessons learnt of local leaders



Discussion on specific topics



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