

Thi Phuong Mai Nguyen

**Local People's Demand for Forest
Ecosystem Services and Drivers of Change
in Vo Nhai District, Northern Vietnam**



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Local People's Demand for Forest Ecosystem Services and Drivers of Change in Vo Nhai District, Northern Vietnam

Dissertation

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By

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Dedicated to
My parents, my husband and my son



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Summary

Originally defined as “*the benefits people obtain from ecosystems*” by The Millennium Ecosystem Assessment in 2003 based on Daily (1997) and Costanza et al (1997), ecosystem services (ES) includes provisioning services, regulating services, supporting services and cultural services. The ES concept was considered to be a mainstream in natural management at all levels of decision-making and it was applied in forest management in some countries. In Vietnam, ES related researches and programs have increased only during the recent five years, most of them focusing primarily on the evaluation of some marketable goods that can undergo economic assessments. The non-marketable values of ES and the social and cultural factors behind, receive inadequate attention.

From the framework of Ecosystem services and the context in Vietnam, the present study focuses on local people’s demands for forest ecosystem services (FES) and on drivers of changes that impact the forest - local people relationship in the Nghinh Tuong and Vu Chan communes, northern Vietnam. The research aims at identifying the local FES demand and the drivers of changes to support and optimize forest management and policy decision-making at the local scale. The demand of local people for FES refers to what they want and need (could be accessible or not due to some reasons) from local forests to serve their life. The requirements for forests depend on local social and cultural characteristics that may change over time by the changes in socio-economic development and management policies. FES supply assessment will be based on the satisfaction of local people for these FES and their perception of ecosystem changes over time to refer the match or mismatch between supply and demand at the research area.

After finding FES relevance and indicators for FES and drivers of change, both qualitative and quantitative data were collected through group interviews, household survey, individual expert interviews; and observations. The study showed the local people’s demand for FES at current time and their demand change over time. They have high demands of water supply, construction wood and fire wood. The FES supply, followed their assessment, has been reduced although supply of some FES still meet the local demand like water supply, medicinal plants and some non-timber forest products (NTFPs). FES usages between communes or between the poor and the non-poor are not much different. In contrast, a Dao family consumes fewer wood for construction and fuel wood than a Tay family, while it requires more NTFPs than the Tay. The forests have more effects on the local cultures, but forest cultural services received inadequate attention from local people. The research also indicated the mismatch between the local people demands and the governmental demands at national and local scale for FES.



Regarding to indirect drivers of change, government policies of forestry and rural development have great impacts on the forest ecosystems. People's awareness, which influenced by their social-economic backgrounds, also have effected on forest use and protection. Additionally, economic development and some social factors such as population growth, local customary and labour allocation were considered as internal indirect drivers of changes in the research areas. Besides all these mentioned endogenous drivers, external demands create pressure on forest resources rather than internal demand for some NTFPs.

From the findings, the research gave some recommendations that are followed three major issues (decision making, forestry economic development and local awareness improvement of FES) for sustainable forest management at local scale.



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Abbreviations

ES:	Ecosystem Services
FES:	Forest Ecosystem Serivces
FPES:	Forest Provisioning Ecosystem Services
MA:	Milliennium Ecosystem Assessment
NTFP:	Non-timber forest product
TS-PH:	Than Sa - Phuong Hoang Natural Conservation Area
TSPHMB:	Management board of Than Sa - Phuong Hoang natural conservation area



CHAPTER 1: INTRODUCTION

1.1. Forests and forest management in Vietnam

1.1.1. Current state of forests

Vietnam is situated along the eastern coast of the Indochina Peninsula in Southeast Asia with the territory of 330 972 km² (FAO 2014; World Bank 2016). On the map, Vietnam is an S-shaped strip of land, elongating 1650 kilometres from the northernmost point to the southernmost point. The country's diverse topography consists of hills, mountains, deltas, the coastline and the continental shelf, reflecting the long history of geology and topography formation in a monsoon, humid climate with strong weather exposure.

For forest management, forests in Vietnam are classified according to forest functions: production, protection, and special-use, as defined by the 1991 Forest Protection and Development Law. *Production forests* are used mainly for production and trading of wood, non-timber forest products, and for purposes of protection and regulation. *Protection forests* are used primarily for protection of ecosystem services, natural disasters prevention, and environmental protection. Unlike production or protection forests, *special-use forests* are designated to the goals of nature conservation, the protection of historical and cultural relics, and environmental protection. (The criteria of this classification are shown in appendix 4).

In 2014, Vietnam had 13.8 million hectares of classified forests including over 6.7 million hectares of production forests (approximately 49%), 4.56 million hectares of protection forests (33%), and about 2.1 million hectares of special - use forests (15%) (MARD 2015) (table 1.1). The national territory under forest cover increased from 27.8% in 1990 (Vu et al. 2011) to over 40% at current time (MARD 2015) as a result of the expansion of forest plantations and regeneration forests in the past two decades (de Queiroz et al. 2013). However, most of this area is plantation forests accounting for about 26.8% of forestry land. Natural forest rehabilitation has grown rather slowly (Vu et al. 2011). Indeed, “natural forests” occupy 73.2% of the total forest cover, but mostly are naturally regenerated forests rather than pristine forests. Primary forests are estimated to represented just 1% of the total forest cover (de Queiroz et al. 2013). Nonetheless, Vietnam has established 128 protected areas accounting for 11.7% of the total forest area. There are 30 national parks, 60 nature reserves and 38 landscape protection areas in the special use forest system (FSIV 2009).

**Table 1.1: Forest composition in Vietnam, 2014, by type and use category (in ha)**

Forest land type	Total	By use category			
		Special-use	Protection	Production	Other
A. Natural forest	10 100 186	2 008 254	3 938 689	4 059 302	93 941
1. Timber forests	8 305 870	1 603 909	3 196 969	3 435 391	69 601
2. Bamboo forest	397 199	46 095	115 094	231 395	4 615
3. Mixed forest	658 294	136 398	210 097	303 964	7 790
4. Mangrove	33 441	973	30 985	1 325	157
5. Limestone forest	705 426	220 878	385 544	87 226	11 777
B. Plantation forest	3 696 302	76 878	625 848	2 692 621	300 973
1. Stocked forest ^b	2 034 212	56 206	412 352	1 416 555	148 098
2. Unstocked forest ^c	1 047 297	13 800	146 629	813 019	73 850
3. Bamboo	99 360	200	7 308	90 935	917
4. Industrial trees (e.g. rubber)	464 390	2 900	34 513	350 039	76 939
5. Mangrove	51 061	3 772	24 047	22 073	1 170
Total	13 796 506	2 085 132	4 564 537	6 751 923	394 914

a. With hardwood forest stock (diameter of breast height ≥ 10 m³/ha)

b. With hardwood forest stock (diameter of breast height ≥ 10 m³/ha)

(Source: (MARD 2015))

The biodiversity of the Vietnam's forests is ranked very high, both in the region and worldwide due to the geographic position, the complicated topography and climate condition (Vu et al. 2011; de Queiroz et al. 2013). The biodiversity in Vietnam's forests includes the variety of natural forest ecosystems and their diversified composition of plant and animal species. In terms of flora, the abundance of plant species has created great economic and scientific values with hundreds of trees for commercial timber production; at least 40 bamboo species having commercial value; and there are thousands of herbal plants and hundreds of discovered species for producing myrrh, tannin and oil (MARD 2006; Vu et al. 2011). Regarding the fauna, Vietnam's forests have quite rich species compositions and a high level of endemism compared to neighbour countries (Vu et al. 2011). Besides their diversified species, Vietnam's forests do also have diversified forest ecologies. Following their ecological characteristics, natural forests are classified into eight major forest groups (MARD 2006), including (1) Evergreen closed tropical rain forest, (2) Semi-deciduous closed tropical humid forest, (3) Evergreen broad leaved forests on limestone, (4) Natural needle leaved forests, (5) Dry dipterocarp forests, (6) Mangrove forests, (7) Melaleuca cajuput, and (8) Bamboo forests (Vu et al. 2011).



1.1.2. Forest management system in Vietnam

Administratively, the forest management system in Vietnam is stratified into four levels, which are (1) central/national level, (2) provincial level, (3) district level, (4) commune level (see table 1.2). The tasks of government agencies and ministries in these different levels are regulated in a legal framework defined by Decree 23/2006/NĐ-CP. Tran et al. (2005) showed two basic kinds of institutions in the management system “*directing organizations*” and “*implementing organizations*”. The directing organizations establish general or on-paper plans while the implementing organizations including professional or special institutions practice the plans that the directing organizations appointed. It means that at the same level of the management system, the directing organizations have a slightly higher position and direct the implementing organizations. All administrative levels are under the control of the state (directing organizations).

Table 1.2: Different organizations of Vietnam’s forestry and forest land management system

Level	“ <i>Directing organizations</i> ”	“ <i>Implementing Organisation</i> ”
The 1 st level: Center	Government and National Assembly	Ministry of Agriculture and Rural Development (MARD) Director General of the Vietnam Forestry Administration (VNFOREST) Ministry of Natural Resources and Environment (MONRE)
The 2 nd level: Province	Provincial People’s Committee (PPC)	Department of Agriculture and Rural Development (DARD) <i>Division of Forest Protection</i> <i>Division of Forests</i> Department of Natural Resources and Environment (DONRE)
The 3 rd level: District	District People’s Committee (DPC)	Forest Protection Station Division of Agriculture and Rural Development Division of Natural Resources and Environment
The 4 th level: Commune	Commune People’s Committee (CPC)	Forestry and Agricultural staff Land management staff

(Source: Tran et al. 2005; Pham et al. 2011)

Below the commune level is the informal system of villages or hamlets that combine households in a single village which are led by the heads of the villages who are important connectors between national laws and existing customary law. The local organizations (such as associations of farmers, veterans, women, elderly, youth, etc.), groups of local households, particular households and individuals are the forestland recipients and directly work on protecting, conserving, and developing the allocated forests (Tran et al. 2005).



1.1.3. Forest development in Vietnam

Vietnam is a repository of global biodiversity, but also still contributes to the heavy losses of biodiversity that are caused by illegal trade and consumption of wildlife as well as forest degradation. To respond to the forest degradation and the serious decreases of forest cover to the lowest level in 1990, the Government has paid much attention to the development of forest resources and biodiversity conservation since then. Besides restricting the forestry sector, a series of laws and legal documents was promulgated relating to forest management and development, in which the Government gave high priority to forest rehabilitation. Vietnam also participates in most international agreements and conventions relevant to biodiversity and tropical forest conservation.

Concurrently with the efforts to develop forests and forestry, the Government focused on the socio-economic development for mountain communities, especially minority ethnic people, whose livelihoods depend on the forests and whose living standards are low. The policies of forest land allocation have given the rights of decision and management to local people motivating forest owners to use forest land in a sustainable way, increase forest-related income and support environment protection (Bui 2006). Land allocation also contributed to the sedentary livelihood for shifting farmers and reduced slash and burn forests for cultivation (Castella et al. 2006). Vietnam has received many financial and scientific supports from international and non-government organization for the conservation of biodiversity and forests (de Jong et al. 2006; Vu et al. 2011), of which, the protected area system has received the majority of investment (Vu et al. 2011).

1.2. Mountain forests and their relevance for local people

1.2.1. Mountainous areas and people in Vietnam

Vietnam has 63 provinces and cities, 19 of which are highland and mountainous provinces and other 23 provinces have mountains (CEMA 1998). Mountain areas occupy three quarters of Vietnam's territory. The Northern Mountains include the Northeast region, formed primarily by uplifted limestone ranging in altitudes, from 300 to 700 meters and the Northwest complex, dominated by the steep topography of the Hoang Lien mountain range, with the highest point, Fan Si Pan (3143m). The Truong Son range runs along the country's western border with Laos. Its complex geology gives rise to a diverse landscape and ranges mostly between 500 and 1500 meters. The Central Highlands, also known as *Tây Nguyên*, consist primarily of a series of plateaus and hills ranging in elevation from 500 meters to 1500 meters. These mountainous areas that comprise 90% of national forest land, over 70% of plants and animals species and over 90% of precious species, provide water, hydraulic power, timber, fuel wood, wild species, medicinal plants and many minerals for the whole country (Vo 2001; Vu 2001).



Mountainous areas are also the habitats of about 25 million people (Le 2001). More than 10 million mountainous residents (over 13%) are estimated to be ethnic minorities, representing 75% of the 53 ethnic minorities population in Vietnam (World Bank 2009). Living in complicated and diversified terrains, the mountainous population in Vietnam has some main features of residential distribution. Ethnic diversity is usual in many mountainous communes or districts (Le 2001; Ngo 2001). Mixed ethnic residence creates cultural exchanges and influences. However, each ethnic has developed in specific geographic areas. For example, *Viet Bac* (in the Northeast) is the residential place of the Tay and the Nung; The Central Highland is the main habitat of the Kho Me and the Nam Dao. Another important feature of ethnic people's distribution is that the development of each ethnic group is related to determined ecological spaces, called "*ethnical ecology*" (*sinh thái tộc người*) (Ngo 2001). Certain minorities, like the Tay, the Thai, the Nung, and the Muong in particular, more commonly live in the valleys within the mountain areas, and thus, have greater access to flat land and to reliable water supply. Other groups, such as the Mong and the Dao in particular, are often associated with higher altitudes and more mountainous slopes (Le 2001; Ngo 2001; World Bank 2009).

Distribution of many minority ethnic groups and sub-groups with their specific social and cultural features adapting to their natural living environments creates cultural diversity for mountainous areas in Vietnam. Cultural variety is represented through traditional social structures (like family, lineage and parentage, village, cultural landscape, etc.), physical and spiritual life, languages, traditional knowledge, adaptive strategies, social institutions, ethical norms and beliefs (Ngo 2001). The culture differences between ethnic groups create also the differences in economic development and integration (Le 2001). Some ethnic groups (especially groups of less than 1000 people) still depend on self-sufficient cultivation methods while some others adapted to new developments as in the lowland areas.

1.2.2. Forest dependency

There is rich evidence in the literature concerning the relations between forests and people. The forests provide multiple products and benefits such as land for cultivation, food, materials, medicine, etc., which are important for day-to-day living. Humans, especial forest people, exploit these products to meet essential parts of their nutritional, energy, and primary health needs and use them in different ways such as direct consumption, inputs for agricultural production, and materials for house construction. Doubtlessly, the forest is a key element of the habitat and of the social and cultural structure of those living within it. For example, the Khasis in India consider forests and every part of their natural produces as the central place into the sanctum of the Khasi religious rites, rituals and social ceremony besides being useful in their daily needs (Shangpliang 2010). Thus, the forest is also a dominant factor that shapes the physical