

**Report on the trade and utilisation of
Fokienia hodginsii
in Lao Cai and Son La provinces,
northern Vietnam**



Photo: Le Quang Trung/FFI

Nguyen Phi Truyen and Thomas Osborn (eds.)

Hanoi
February 2006

Copies of this report may be obtained from:

Hoang Lien Mountain Ecosystem Project
c/o Fauna & Flora International - Vietnam Conservation Support Programme
340, Nghi Tam, Hanoi, Vietnam.

Tel.: + 84 4 719 4117
Fax: + 84 4 719 4119
Email: vietnam@ffi.org.vn
Website: www.hoanglienson.org.vn

Suggested citation:

Full report:

Nguyen Phi Truyen and T. Osborn (eds.) (2006). Report on the trade and utilisation of *Fokienia hodginsii* in Lao Cai and Son La provinces, northern Vietnam. Fauna & Flora International – Vietnam Conservation Support Programme.

Chapter reports:

Nguyen Phi Truyen (2006) Legal trade of *Fokienia hodginsii*. In Nguyen Phi Truyen and T. Osborn (eds.) Report on the trade and utilisation of *Fokienia hodginsii* in Lao Cai and Son La provinces, northern Vietnam. Fauna & Flora International – Vietnam Conservation Support Programme.

Nguyen Van Duong, Le Duy Tan, Lo Van Thanh and Leo Van Bien (2006) Illegal trade of *Fokienia hodginsii*. In Nguyen Phi Truyen and T. Osborn (eds.) Report on the trade and utilisation of *Fokienia hodginsii* in Lao Cai and Son La provinces, northern Vietnam. Fauna & Flora International – Vietnam Conservation Support Programme.

Le Quang Trung, Le Trong Hai and Nguyen Manh Hiep (2006) Subsistence use of *Fokienia hodginsii*. In Nguyen Phi Truyen and T. Osborn (eds.) Report on the trade and utilisation of *Fokienia hodginsii* in Lao Cai and Son La provinces, northern Vietnam. Fauna & Flora International – Vietnam Conservation Support Programme.

Table of contents

Table of contents	iii
Abbreviations and acronyms	v
Unit conversion	v
Acknowledgements	vi
Executive Summary	vii
Introduction	3
1. Legal trade of <i>Fokienia hodginsii</i>	8
1.1 Information and collection methods	8
1.2 Results	10
1.2.1 Overview of national legislation surrounding trade and use	10
1.2.1.1 National harvesting regulations for <i>Fokienia hodginsii</i>	10
1.2.1.2 International import and export of <i>Fokienia hodginsii</i>	13
1.2.2 Current distribution of <i>Fokienia hodginsii</i> in Lao Cai and Son La	15
1.2.3 Legal logging quotas	15
1.2.4 Timber confiscations	17
1.2.5 Timber imports	21
1.2.5.1 National imports	21
1.2.5.2 International imports	21
1.2.6 Plantations	21
1.2.7 Processing workshop and transport routes	22
1.2.8 Provincial export of <i>Fokienia hodginsii</i>	24
1.2.9 Timber demand	27
1.3 Summary of the legal trade of <i>Fokienia hodginsii</i>	28
2. Illegal trade of <i>Fokienia hodginsii</i>	30
2.1 Introduction	30
2.2 Methods	31
2.3 Results	31
2.3.1 Illegal trade in Son La province	31
2.3.2 Illegal trade in Lao Cai province	38
2.4 Summary of the illegal trade survey	38
3. Subsistence use of <i>Fokienia hodginsii</i>	41
3.1 Survey methodology	41
3.2 Survey results	42
3.2.1 Exploitation, use and trade of <i>Fokienia hodginsii</i>	42
3.2.1.1 Exploitation	45
3.2.1.2 Use	48
3.2.1.3 Trade	51

3.2.2	Institutional issues	57
3.3	Summary of subsistence use of <i>Fokienia hodginsii</i>	58
4.	Conclusions	60
4.1	<i>Fokienia hodginsii</i> trade and use framework	60
4.2	Constraints of management and control of timber trade activities	62
4.3	Illegal <i>F. hodginsii</i> trade in Bac Yen and Van Ban districts	62
4.4	Subsistence use and trade of <i>Fokienia hodginsii</i>	63
4.5	Assessment on the level of threats posed to <i>Fokienia hodginsii</i>	64
5.	Discussion	67
5.1	Survey confidentiality	67
5.2	Levels of exploitation of <i>Fokienia hodginsii</i>	68
5.3	Local perceptions of <i>Fokienia hodginsii</i>	69
6.	Recommendations	71
6.1	Legislation and law enforcement	71
6.2	Local initiatives and issues	73
6.3	Biological research	74
6.4	Socio-economic research	75
7.	References	76
Annexes		80
	Annex 1: Training workshop report	80
	Annex 2: List of government legislation regarding <i>Fokienia hodginsii</i>	85
	Annex 3: Details of forested and natural areas in survey areas in Lao Cai and Son La provinces	88
	Annex 4: Violation types and associated penalty levels	90
	Annex 5: Forest protection and development law violations from 2001 to 25/11/2005	92
	Annex 6: Natural and socio-economic conditions of Nam Xay commune (Van Ban district) and Ngoc Chien commune (Muong La district)	94
	Annex 7: Actions to be taken as outlined in the National Action Plan on wildlife trade control	100
	Annex 8: Current status of knowledge regarding <i>F. hodginsii</i> standing volume and ecology	102
	Annex 9: Distribution of <i>Fokienia hodginsii</i> in Vietnam	106
Maps		5
	Map 1: Map showing relative positions of Lao Cai and Son La provinces in north-western Vietnam	5
	Map 2: Map showing survey districts in Son La province	6
	Map 3: Map showing Van Ban district	7
	Map 4a: Sketch map for <i>F. hodginsii</i> (Pomu) distribution in Nam Xay Commune	43
	Map 4b: Sketch map for <i>F. hodginsii</i> (Pomu) distribution in Ngoc Chien Commune	44

Abbreviations and acronyms

CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CRES	Centre for Natural Resources and Environmental Studies
DARD	Department of Agriculture and Rural Development
dDARD	District Department of Agriculture and Rural Development
pDARD	Provincial Department of Agriculture and Rural Development
dbh	Diameter at breast height
FDD	Forestry Development Department
FFI	Fauna and Flora International
FPD	Forest Protection Department
dFPD	District Forest Protection Department
nFPD	National Forest Protection Department
pFPD	Provincial Forest Protection Department
HLSP	Hoang Lien Son Project
MARD	Ministry of Agriculture and Rural Development
MoF	Ministry of Forestry
PC	People's Committee
dPC	District People's Committee
pPC	Provincial People's Committee
PRA	Participation Rapid Assessment
SFE	State Forest Enterprise
VND	Vietnamese Dong

Unit conversion

1 US\$ = 16,000 VND

Acknowledgements

This report would not have been possible without the generous financial assistance of the 'Flagship Species Fund' of the UK government's Department of Environment, Food & Rural Affairs (DEFRA).

In undertaking this work, the authors wish to acknowledge and thank the staff of FFI who assisted and facilitated research during this survey particularly Mark Infield, Steven Swan, Nguyen Bich Ha, Le Yen Anh, Hoang Lan Huong, Le Ry, Ly Van Trong and Nguyen Huu Dung.

Thanks are due to the staff of the Forest Protection Departments of Lao Cai and Son La provinces, Van Ban, Muong La and Bac Yen districts, and Nam Xay and Ngoc Chien communes for providing information and facilitating the work.

Also to the villagers of Nam Xay and Ngoc Chien for providing information and hospitality both of which provided a rewarding experience during this survey.

Thanks also go to Vu Ngoc Thanh for his wisdom during the training! And to Mai Ky Vinh for his beautiful maps!

Particular appreciation and thanks go to Pham Xuan Duong for his extensive field and report translations and for providing opinions when asked! And to Scott Robertson for guidance and provision of materials for the training and for his support and valuable comments on the research presented in this report.

Executive summary

Background

Fokienia hodginsii is a monotypic, ancient, 'living fossil', member of the Cupressaceae family. This conifer species is highly valued throughout its range, both economically and culturally, and forms an ecologically integral component of its shrinking habitat. It is endemic to Laos, Vietnam and southern China where it is widespread and, therefore, is currently listed as globally near-threatened (IUCN 2004). Within Vietnam, *F. hodginsii* is being extensively harvested leading to severe population fragmentation and local extinction, to supply lucrative domestic, and possibly foreign, markets.

This report is produced as part of the Fauna & Flora International Vietnam Conservation Support Programme within the activity framework of the European Union-funded *Community-based Conservation of the Hoang Lien Mountain Ecosystem Project*. The report aims to provide an overall picture of the use and trade of the conifer *Fokienia hodginsii* within Muong La and Bac Yen districts of Son La province (Map 2), and Van Ban district of Lao Cai province (Map 3).

Very little data is currently available on the trade and use of this species and it is feared that this species is now highly threatened within Vietnam. The following report presents the results of limited research in two provinces in northern Vietnam.

Research was conducted into three main areas:

1. Legal use and trade of the species in Vietnam;
2. The Illegal commercial trade and use of the species at the district level;
3. Subsistence use at the commune level.

Legal use and trade

The legal use and trade of *F. hodginsii* within Vietnam is restricted by law and currently poses only a limited threat to the continued survival of the species. The purpose of the legal sale of the timber is to generate income for the province while the purpose of legal purchase is generally a show of wealth (through construction and furniture making). Both sale and purchase of the timber are essentially superfluous; income from sale can be derived from alternative income generation mechanisms (especially in the provinces surveyed which have busy international border crossings).

Legal sale results from three potential source mechanisms: international import of timber; provincial quota allocation; and the legalizing of illegally harvested timber through confiscation and subsequent government auction. The first method has been addressed: there is currently no legal international import (or export) of *F. hodginsii* in Vietnam. The second method must undergo several legal assessments throughout the application and harvesting process and supporting legislation appears strong: there is no evidence from this survey to suggest illegal timber exploitation through this process. Between 2001 and 2005 Son La was provided with a quota of 4,404 m³ (harvested through Muong La and Phu Yen State Forest Enterprises - SFEs) and Lao Cai a quota of 1,954.8 m³ (through Van Ban SFE).

The third method is more controversial. Timber sourced from confiscations of illegally harvested timber is auctioned by the province and the resulting revenue is returned to the state. The problem arises in that this method itself does not lend incentive to preventing illegal harvesting; on the contrary, if illegal harvesting were strictly enforced then confiscations would decline and the state would lose revenue from auctions. The process itself potentially allows for illegal timber to be laundered under state sanctions through poor enforcement which in turn encourages illegal exploitation. Under this process it is often the loggers (often local farmers in need of income) from whom the timber is confiscated that are targeted for punishment rather than the subsequent trader. Currently, violations of the law are punishable by fines, or in extreme cases, criminal proceedings. However, loggers often have little or no money or assets and so many infringements go unpunished. Throughout this system a vicious circle exacerbates the problem and leaves the poor remaining poor while the rich dealers get richer. Such a position only serves to undermine protection of the species and conceivably increase its over-exploitation.

While the above mechanism remains possible, actual confiscations from 2001 to 2005 by the forest protection authorities have remained relatively low: Muong La: 51.5 m³; Bac Yen: 291.2 m³; and Van Ban: 119.0 m³. The number of recorded violations involving *F. hodginsii* have also remained low: Muong La: 71 violations of which the most common violation was illegal transportation; fines enforced totaled 66 million VND; Bac Yen: 72 violations of which the most common violation was illegal harvesting; fines enforced totaled 221 million VND; Van Ban: 143 violations of which the most common violation was illegal transportation; fines enforced totaled 156 million VND.

There are two possible reasons for the low confiscations and recorded violations: firstly that there is little illegal *F. hodginsii* timber in the market, or secondly that the forest protection authorities are not proactively confiscating timber (or not recording confiscations). This report shows that the former is certainly not the case.

Information gathered during this survey component focused on target districts. However, in order to produce a clearer and more accurate picture of overall trade dynamics information should be gathered from other districts within the province as well as bordering provinces. Limitations in the scope of the survey also preclude understanding end-use of legally sourced timber. It is possible (though speculative) that legally sourced timber may enter the illegal trade (such as international trade).

Illegal trade of *Fokienia hodginsii*

The illegal trade in *F. hodginsii* timber forms the largest component, in terms of volume, of the timber trade and use survey.

Where timber is illegally harvested and exploited locally, the timber is transported through little used routes, often under cover of darkness, to processing shops or traders houses. Such timber is usually 'mixed' with legally purchased *F. hodginsii* timber from state auctions. In these cases it is often very difficult to assess the legality of the timber. While auctioned timber must carry the official Forest Protection stamp for authenticity, once the timber has been processed, or part processed, the stamp is no longer in evidence and the illegally sourced timber can then be sold as legal wood. This process is very common in all localities, is difficult to control and succeeds, in part, due to poor

enforcement (checking of log books¹ etc). Traders at the district level appear to employ local loggers for the majority of locally sold timber. Local loggers also often carry small timber blocks for sale in local markets as and when cash is in short supply.

In many cases, timber is harvested from forests and exported (hidden under other goods) directly out of the source district to larger towns in adjacent provinces (such as Viet Tri in Phu Tho province and Nghia Lo in Yen Bai province) to supply wealthy households. For example, it is estimated that approximately 80% of the average 100 - 130 m³ /month of illegally harvested *F. hodginsii* timber from Bac Yen district is exported out of the district. In these cases again local loggers are usually hired by timber dealers to cut the timber. In other areas, loggers are brought in to an area to harvest the timber, for example in Ngoc Chien commune of Muong La district.

F. hodginsii timber market prices are generally slightly higher than those for auctioned timber, especially in the large town or cities. In Bac Yen prices vary from 3 ½ – 7 million VND/m³. In Phu Yen prices are generally 3 ½ – 4 million VND/m³ for logs; high quality timber can sell for 6 million VND/m³. *F. hodginsii* wood bought directly from Muong La costs only 2 – 3 million VND/m³ while market prices in Son La town for logs or pre-processed timber are approximately 7 ½ - 8 million VND/m³. The profits gained by traders in, for example, Muong La can be 3 – 4 times that of local loggers in the commune. Economics for *F. hodginsii* timber therefore point to greater profit for sellers in the larger towns than locally. The mechanism usually sees traders from the larger towns exploiting the timber at the local level and transporting to the larger towns for increased financial benefit.

This survey component provides a 'snapshot' of the illegal *F. hodginsii* timber trade. Results suggest that the illegal trade network is highly complex with timber being distributed widely around northern Vietnam. End-use of the timber remains unclear within this extended network and there are likely to be many trade linkages that are not covered by the survey.

Subsistence use of *Fokienia hodginsii*

At the local (communal and village) level, *F. hodginsii* timber is most often used for local construction purposes, such as house building. According to local loggers from the survey areas there are three types of *F. hodginsii* tree, of which the tree providing yellow wood is the most widely used and traded commercially. Traditionally most *F. hodginsii* trees are harvested when they have attained a dbh of greater than 100 cm but increasingly trees of smaller girth are being felled due to harvest pressure. Harvesting of *F. hodginsii* can be conducted year-round and time taken to harvest and pre-process timber at the extraction site varies depending on the size of the labour force and amount of timber required. The amount of *F. hodginsii* timber used depends on ethnic traditions: Thai people use more timber in house construction than H'mong or Dao. Amount extracted is also a function of wealth and social standing with larger, richer households extracting the greater amounts. Usage of the timber over time has remained relatively constant and volumes required have been a function of population increase.

¹ Official log books are used to record the amounts and types of timber passing through a workshop. In principle law enforcement agents (such as FPD staff) must check these books regularly to confirm legal compliance. In reality these books are not often officially checked leading to opportunities for law infringement.

In most areas surveyed, while subsistence use has remained relatively stable, illegal trade has increased dramatically. In Nam Xay commune, some local farmers have decided to farm Cardamom (*Amomum aromaticum*) which brings high income at low personal risk; in these cases local people are less involved in timber trade. Nevertheless, the (potentially negative) impact of widespread cultivation of Cardamom has not been sufficiently researched to suggest it as a suitable replacement for *F. hodginsii* harvesting.

The subsistence use survey provides information mainly regarding use of *F. hodginsii* by three ethnic groups. Use-patterns of other ethnicities have not been assessed, nor have use-patterns in areas without *F. hodginsii*-containing forest. Crucial to understanding sustainable harvesting issues is an assessment of the age of harvested trees. Such information was not available during this survey.

Enforcement and corruption

According to local informants in all areas surveyed, overt enforcement of the law regarding *F. hodginsii* has increased over the last five years. However, it is clear from this report that still far too little is being done to curb illegal activities. The number of recorded violations is low, and the amount of confiscated timber and corresponding penalties are low; little or no checking of official log books are being undertaken. In comparison, the limited information gathered during these surveys has already suggested a high level of trade in *F. hodginsii* timber with local reports of continued high exploitation organized by timber traders. Many areas need to be addressed, including low staffing levels of forest protection authorities, low salaries, poor equipment, safety for enforcement officials against reprisals and a lack of incentives for encouraging enforcement. However, perhaps the single most damaging aspect is corruption of officials. During this investigation there was evidence of corruption from very senior positions in the provincial government and forest protection authorities to low ranking officials. Until the issue of corruption is addressed it is likely that any remedial actions will be ineffective (FAO 2005). Corruption needs to be addressed from a top down approach with senior corrupt officials being replaced initially and increased penalties being distributed amongst officials found to be breaking the law.

The illegal trade of *F. hodginsii* timber poses the largest direct threat to the continued existence of this species in Vietnam with a conservatively estimated 80 – 90% of all traded *F. hodginsii* timber of illegal origin. Trade is demand driven and with increasing prosperity within the country demand is also increasing. Legislation must target initially those who facilitate the trade, particularly the traders. Local people who use the species for subsistence rely on the use of *F. hodginsii* and have little option but to use it, nor can penalties be easily applied to them. Measures should be taken to work with local people through more sustainable use of the forest for subsistence use in general and actively involve them in working against the destructive timber trade.

Recommendations

A number of recommendations are made to attempt to address the illegal trade of *F. hodginsii*. These are presented in the relevant chapter in this report. However, several recommendations listed here are of greater, immediate importance and these recommendations should be considered priority actions.

Under current conditions, trade and use of *F. hodginsii* is likely to be unsustainable. Actions need to target timber traders and consumers which drive the market; and change law enforcement practices to make them more effective and efficient.

However, too much information still remains unknown regarding the sustainable use and trade of *F. hodginsii* within Vietnam. This report shows that the species is certainly under serious threat of continued survival but cannot categorically state when final populations are likely to be lost. Much information is required including current standing volumes of timber, and the species ecology and regeneration in order to assess the potential sustainable harvesting of trees. More research needs to be conducted on the illegal trade of the timber to get a clearer idea of volumes of *F. hodginsii* timber in on the market. However, such research takes time and with exploitation continuing at current levels results may appear too late. A complete ban on legal *F. hodginsii* use would both help to provide time and facilitate enforcement (i.e. all *F. hodginsii* timber on the market would then become illegal and could not be hidden amongst legal, auctioned timber). Concomitant with the duration of the ban other activities should be undertaken to reassess the status of the species both ecologically and in the trade, and the enforcement mechanism strengthened. A review of such information when available would assist in assessing the duration of the ban and whether continuation would be necessary.

Overriding requirement

Measures must be developed to **combat corruption** amongst law enforcement agencies and officials. Severe punishments and removal from position must be implemented against any official found to be corrupt or abusing their position. Until enforcement officials act entirely within the law the following recommendations are unlikely to succeed.

Priority legislation and law enforcement

- **Introduce a temporary ban on the entire legal trade of *F. hodginsii*. This ban should be enforced until such time as corruption has reduced and enforcement increased (until at least 2010 when the situation should be reviewed). Included must be the cessation of auctioning of *F. hodginsii* timber (which should be stockpiled until the review has been conducted).**
- Abolish provincial harvesting quotas with immediate effect. New quota applications should not be approved.
- Maintain the current ban on international import and export of *F. hodginsii*.
- Develop legislation to close the loophole allowing any species of illegally harvested timber to be hidden in legal consignments. All timber dealers must be registered (with registered premises) and demonstrate a clear paper trail from purchase to sale. Buyers should maintain the same paper trail to ensure transparency. Forest protection agencies, or a multi-task force, should be charged with regular and frequent spot checks on workshops and assess log books thoroughly. Severe penalties must be administered to those who

mismanage the paper trail and who are found to be trading in illegally sourced timber.

- Forest rangers must be given more comprehensive training in law enforcement skills, including measures on personal safety and investigation techniques, for timber and other forest resource management issues (such as wildlife).
- Develop incentives and/or a reward scheme acknowledging rangers' and other law enforcement officials' high quality work.
- Local authorities such as the pPC should develop more concrete, transparent legislation for local communities, particularly for sensitive areas such as dams. Such legislation should be made easily available to local communities through district and communal PCs.
- Illegal timber activities and subsequent penalties should be enforced thoroughly and brought to a swift conclusion. In order for this to occur, the entire chain of enforcement needs to be strengthened at all levels and involving the appropriate government authorities including FPD, customs, police, border police and judiciary. Such enforcement needs to be ensured *at all times*.
- Increase provincial and district cross-border cooperation of FPD to prevent outsiders crossing borders to extract timber and other forest products. For example, currently there is some collaboration between Son La and Yen Bai pPCs, but none between pFPDs. Increased enforcement activity during the common hours of law transgression (such as at night and lunch times) should also be established.
- Develop a national campaign targeting end users of *F. hodginsii* and raising awareness of the issues of *F. hodginsii* trade and use; and informing users and traders of illegal timber of the penalties associated with illegal activities.

Priority local initiatives and issues

- Natural resource management roles of local authorities, such as project planning and monitoring, should be shared with local people, thus reducing staff workload while increasing management effectiveness².
- Make local people responsible for the forest with *F. hodginsii* through the development of stewardship initiatives and a reward scheme for adequate protection of the trees. Such a scheme could allow *F. hodginsii* inclusion into activities under Decision 304³.

² See Asian Development Bank (1997), GTZ (2004) and International Development Research Centre (2005) for examples of successful approaches.

³ Decision 304/2005/QĐ-TTg dated 23/11/05 by the Prime Minister on *the pilot allotment of forests and contractual assignment of forests for protection to ethnic minority households and communities in hamlets and villages in the central highlands provinces*.

- Increase awareness in local communities regarding the values of *F. hodginsii*, the risks of over-exploitation and sustainable use of the timber.
- Research high-income, legal alternatives to *F. hodginsii* harvesting for trade. Such alternatives should recognize suitable management of activities both from an economic and environmental perspective.
- Research and develop community-managed nurseries selling seedlings to government reforestation and production schemes.

Priority biological research

Current levels of information regarding the biology, and particularly ecology of *F. hodginsii* are limited. However, this information is crucial in addressing questions of conservation and sustainable harvesting, including regeneration, of the species *in situ*.

Using remote sensing data and field surveys select test areas to:

- Estimate approximate standing volume of *F. hodginsii* forest
- Assess regeneration of *F. hodginsii*;
- Conduct age class mapping;
- Estimate densities of trees in various forest types at different altitudes;
- Assess the impact of selective logging of *F. hodginsii* on the forest ecosystem in general

Other biological research is also recommended in order to assess the potential for alternatives to the use of *F. hodginsii*:

- Research viable timber and cash crop alternatives to *F. hodginsii*

Priority socio-economic research

- Further research into the trade in illegal *F. hodginsii* should be conducted to produce a clearer picture of the current situation regarding the exploitation of this species. The results presented in this report only provide a 'snapshot' of current activities and larger amounts of data would elucidate the trade mechanism further. It is also recommended that a similar survey be undertaken in the same locations after two years to assess any changes in activities relating to *F. hodginsii*.

Introduction

Lao Cai and Son La are two upland mountainous provinces in the north of Vietnam containing international borders with China and Laos respectively (see Map 1). These provinces are home to many ethnic groups who display strong traditional and cultural practices, including Dao and H'mong from Lao Cai and Thai from Son La. Basic statistics regarding land and forest area are provided in Table 1.

Table 1: Basic statistics for Lao Cai and Son La provinces

Statistics \ province	Lao Cai	Son La
Number of districts	8	10
Number of large towns/cities	1	1
Natural area (ha)	635,708.0	1,405,500.7
Forest land (ha)	419,576.3	916,149.4
Natural forest (ha)	224,839	497,429.0
Forest cover (%)	43.2	37.2

Source: Lao Cai and Son La PCs

Forests of the two provinces are not only significant in relation to the protection of watershed areas but also generate considerable economic benefits, especially for the local people. The forests contain numerous rare and nationally protected animal and plant species including many orchid and conifer species.

One such conifer species is *Fokienia hodginsii*, an increasingly rare species that is highly valued in Vietnam for its special qualities and one that has large economic value for local residents. This monospecific species is restricted in its natural range to Southern China, northern Laos and Vietnam; within Vietnam some of the largest natural areas still containing important populations of the species are found within Yen Bai, Son La and Lao Cai provinces, most notably along the Hoang Lien Son mountain range (see Map 1). The species appears to be altitude restricted and is found scattered or in small, pure stands in mixed evergreen forests at altitudes ranging from 900 - 2,500 m above mean sea level (Anon 1996).

It is typically these forest areas that are home to the ethnic minority groups. These people often have a low living standard, poor healthcare and education with a high degree of poverty (see Annex 6). They are also heavily reliant on forest products both for subsistence and to provide income through trade. Traditionally, for many of these ethnic groups, the subsistence use of *F. hodginsii* has been a part of their culture and it is common for the wood to be used in construction (mainly), for coffin production and also for household furniture and implements (see section 3.2.1.2).

However, it is not solely subsistence use by local people that has affected standing populations of *F. hodginsii*. Over the last 15 years the trade in *F. hodginsii* timber and wood products has boomed with a massive apparent decrease in standing population sizes and viability (Osborn 2004). This decrease in *F. hodginsii* populations has raised concerns over the continued existence of viable populations of this slow-growing species in Vietnam and it is thought that illegal trade may pose the species' greatest threat.

In recent years, the Government of Vietnam has introduced many laws to protect and limit use of this wood (see section 1.2.1 and Annex 2). International export of this timber has been banned and restrictions placed on legal harvesting, permitting only the harvest of dead or dying wood. Nevertheless, trade in illegally harvested wood has continued to the extent that the tree has become either locally extinct or extremely scarce in many localities in northern Vietnam.

In 2004, the Government of Vietnam produced an Action Plan to strengthen the control of trade in wild fauna and flora to 2010⁴. Its overall objective is to 'enhance the effectiveness and efficiency of wildlife trade controls by relevant enforcement agencies to prevent the illegal wildlife trade [including flora], striving toward sustainable governance and use of wildlife resources, and contributing to the implementation of the National Strategy for Environmental Protection to 2010.' While it is too early to assess results to date (the initial assessment has not yet been completed) this report hopes to highlight some of the requirements and actions necessary for tackling the illegal trade in *F. hodginsii* timber. This report aims to fulfill Article 1, Action 13 of the Action Plan in 'Assessing the status, characteristics and trends in legal and illegal market demand.....Recommending solutions for the management and control of the legal and illegal markets' for *F. hodginsii*.

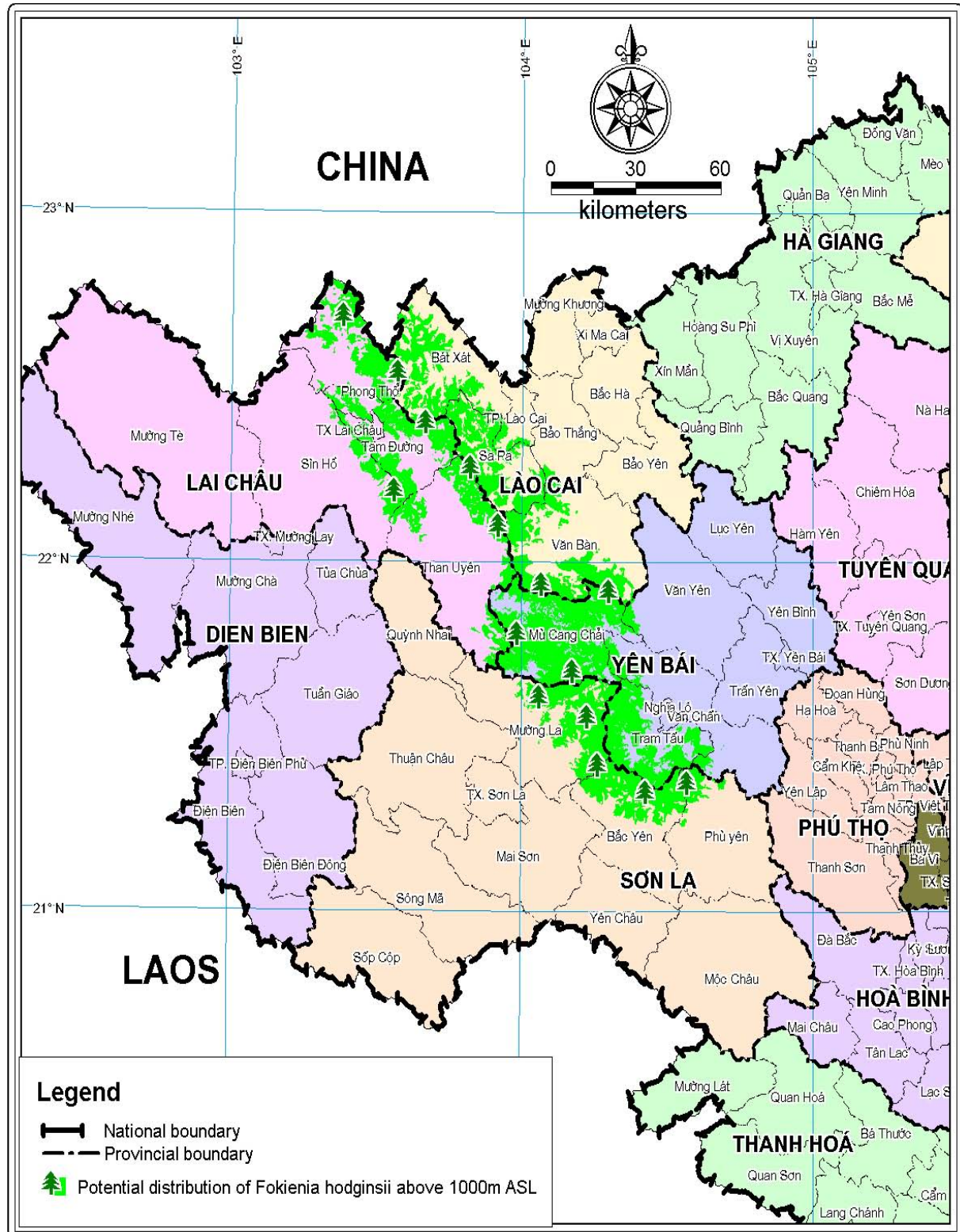
This study is undertaken through the Fauna & Flora International Vietnam Conservation Support Programme within the activity framework of the Community-based Conservation of the Hoang Lien Mountain Ecosystem Project. Following on from the report 'Preparation and implementation of a strategy for the management of *Fokienia hodginsii* in Vietnam by 2008' (Osborn 2004), this report presents research on the three major components affecting *F. hodginsii* survival in sites in Lao Cai and Son La:

1. Information regarding the legislative framework for legal harvesting of *F. hodginsii* in the target areas together with data on quotas allocated;
2. Information regarding illegal trade dynamics of *F. hodginsii* in local towns;
3. Information on subsistence use and patterns of *F. hodginsii* by the target communities.

At the conception of this piece of research it was hoped that research into the above aspects could occur at the same sites in Van Ban and Muong La districts (in Lao Cai and Son La provinces respectively – see Maps 2 and 3) in order to maximize conformity of data, provide comparisons between sites and detail an overall 'snapshot' of the status of *F. hodginsii* in these areas. Unfortunately, permission from provincial authorities to conduct 'undercover' research into the illegal trade was not provided for the proposed target districts. The results therefore are not able to provide comprehensive data for select sites, nor provide detailed comparisons. They do, however, give general insights into practices and methods of *F. hodginsii* use and trade. It is hoped that the information presented in this report may be used in assisting the development of a management plan for *F. hodginsii* in Vietnam.

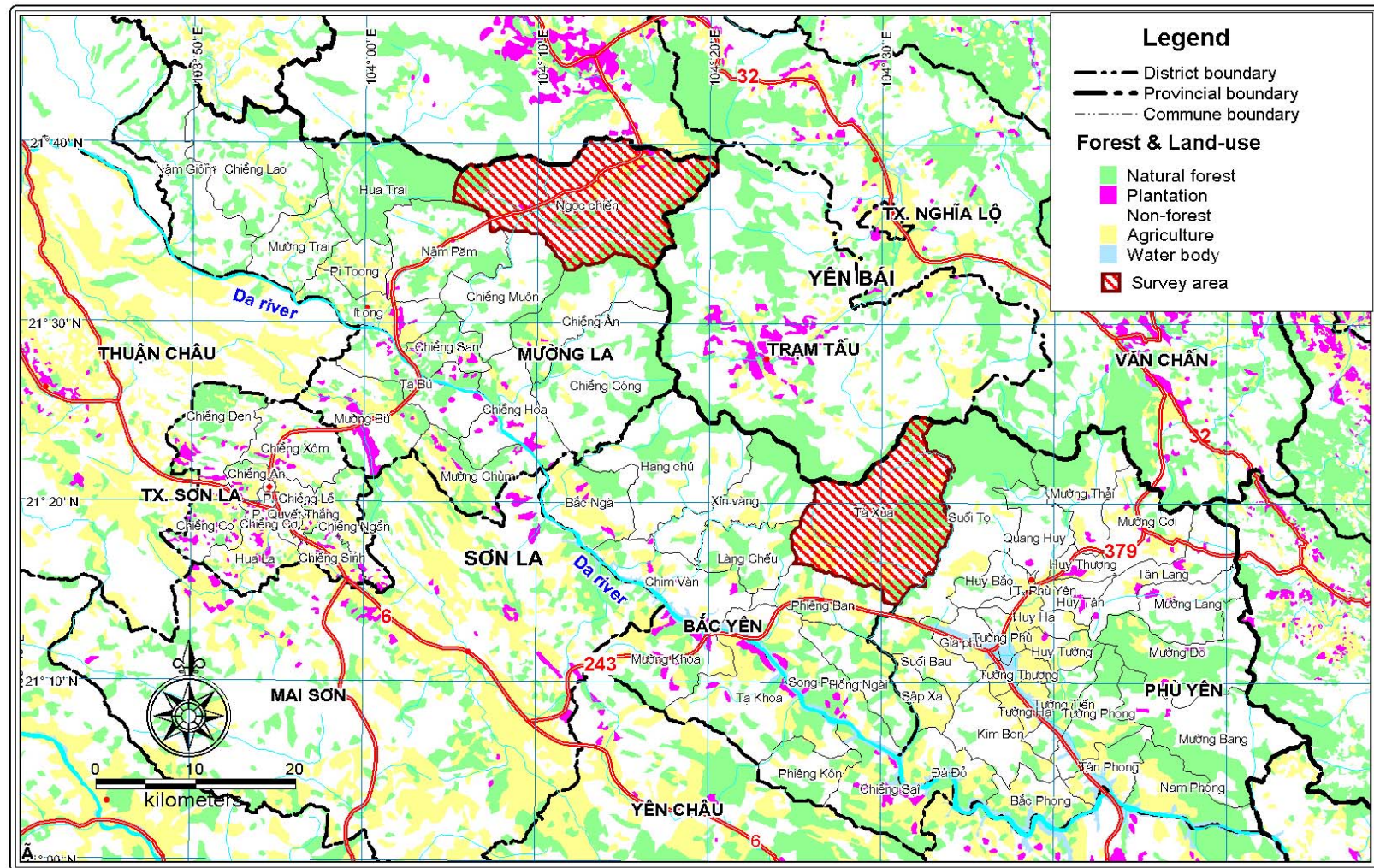
⁴ Under Decision 1021/2004/QĐ-TTg dated 27/09/04 on approving an Action Plan to strengthen the control of trade in wild fauna and flora to 2010.

Map 1: Map showing relative positions of Lao Cai and Son La provinces in north-western Vietnam.



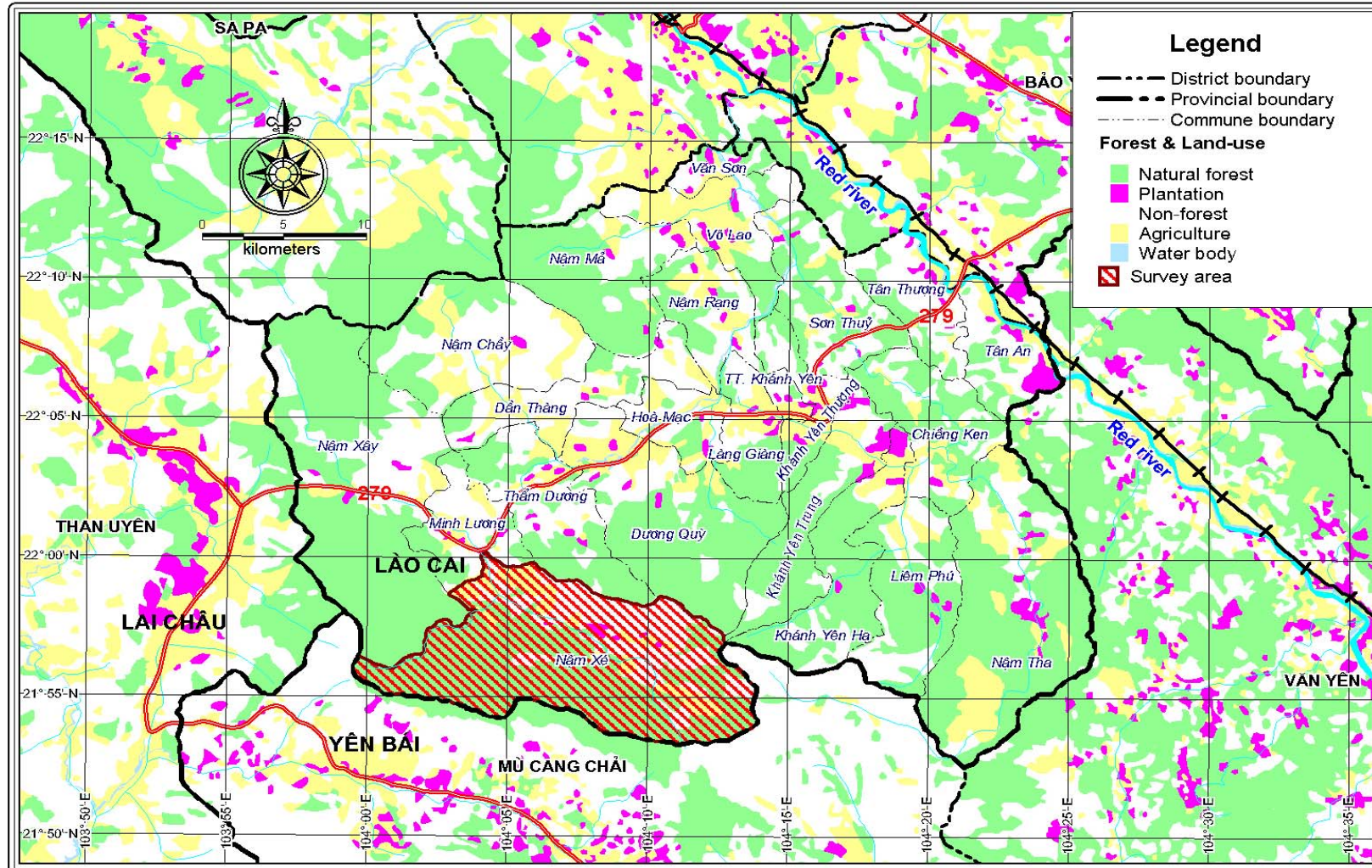
Map: Mai Ky Vinh

Map 2: Map showing survey districts in Son La province. Hatched areas show communes of particular interest during this survey.



Map: Mai Ky Vinh

Map 3: Map showing Van Ban district. Hatched area shows commune of particular interest during this survey.



Note: Nam Xay and Nam Xe commune names are incorrectly labeled and should be reversed.

Map: Mai Ky Vinh

Legal trade of *Fokienia hodginsii*

Nguyen Phi Truyen
National Forest Protection Department, Hanoi

1.1 Information collection and survey methods

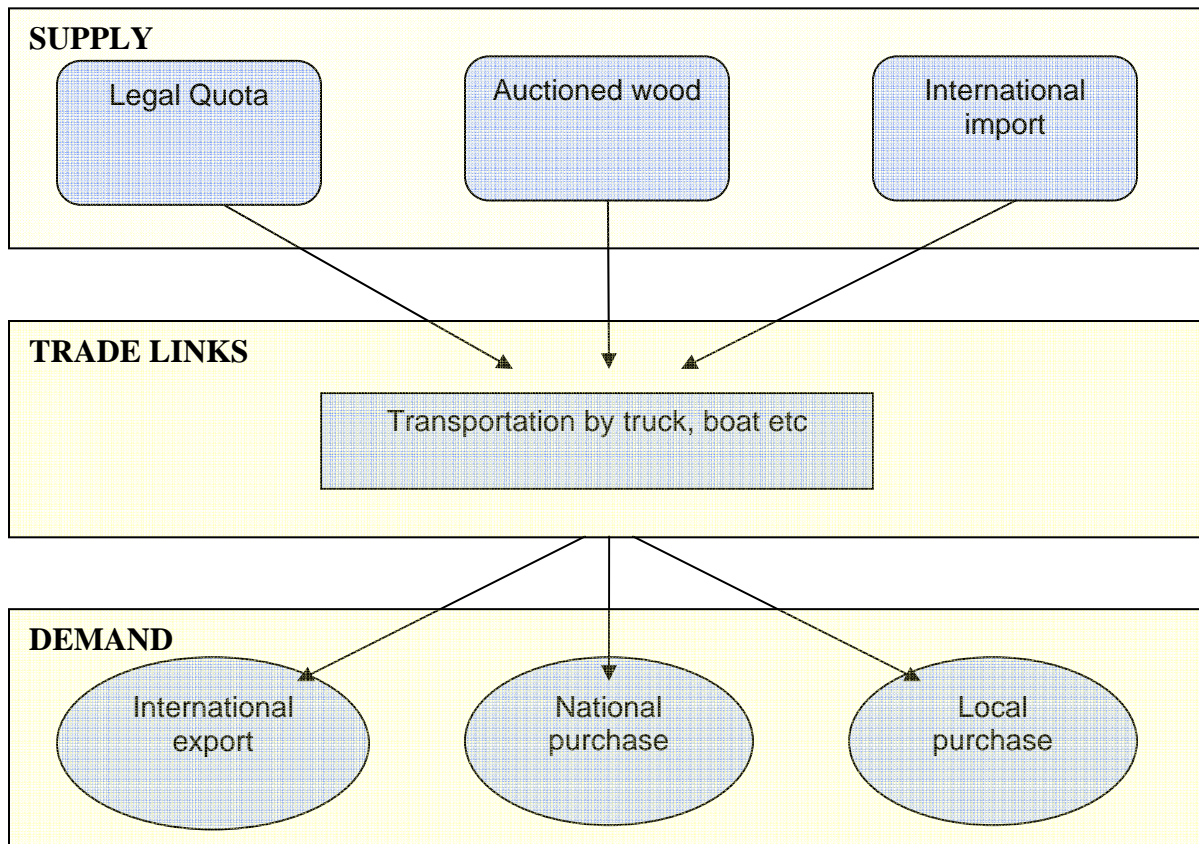
The survey into the legal harvest and utilisation of *Fokienia hodginsii* was conducted by the collation of information from official government documents. Several documents regarding national legislation were available at the national level (mostly presented in section 1.2.1) with most pertinent information regarding harvesting quotas, violations and other practical information was gathered at the provincial and district levels (presented in section 1.2.2). Information gathered at the national level included that surrounding the laws and legislation of *F. hodginsii* exploitation (and often timber in general), and supplementary information regarding the harvesting and utilisation, and legal violations, of *F. hodginsii* in Lao Cai and Son La provinces (including available district information). Further information was gathered during visits to the provinces and districts surveyed for this report. Information from these areas included details on: full harvesting quotas (both allocated and actual figures), provincial export and transportation, official timber processing companies in the survey areas, and *F. hodginsii*-related law violations and confiscations from 2001 to October 2005.

Information was gathered from a number of state sources including the Ministry of Agriculture and Rural Development (MARD), the national Forest Protection Department (nFPD), Lao Cai and Son La provincial Forest Protection Departments (pFPDs), Van Ban, Muong La and Bac Yen district Forest Protection Departments (dFPDs), and Van Ban and Muong La State Forest Enterprises (SFEs).

Original survey plans involved the gathering of data from two districts, Van ban and Muong La. However, with permission being denied for the survey into illegal trade and use of *F. hodginsii* in Muong La (see Introduction), information was also gathered for Bac Yen district. However, it is clear from the limited official information available that much information is incomplete (e.g. exact sources and associated amounts of confiscated timber). What information was available is provided below.

The basic legal process of the trade and utilisation of *F. hodginsii* can be represented as a simple supply and demand chart (see figure 1).

Figure 1. Basic structure of legal *F. hodginsii* supply and demand



Legal sources of *F. hodginsii* can include both international imports (e.g. from China and/or Laos) and national imports (from other provinces), provincial harvesting quotas and the confiscation of illegally sourced timber. Imports may not necessarily reflect the natural range of *F. hodginsii* distribution as it is conceivable that the timber is transported through proxy countries or provinces (for example see Lawson's presentation (2004) on a high profile international case regarding the 'import' of Indonesian timber to Vietnam). Provincial harvesting quotas for *F. hodginsii* are based on requirements of the province of occurrence and, officially at least, are not demand driven (see section 1.2.1.1 and Box 2). Confiscations of illegally sourced *F. hodginsii* are conducted by FPDs with the timber subsequently 'legalised' through public auctions.

Transportation provides the link from supply to demand with the majority of legally sourced timber transported within Vietnam along national highways.

Demand for legally sourced *F. hodginsii* timber within Vietnam appears great. At the local (district or provincial level) the timber is used in private construction (for supports, walls, doors, window frames etc) and for furniture. Nationally, *F. hodginsii* can also be bought at local auction for private construction and furniture though much is allocated for government purposes. There is currently no legal international trade of *F. hodginsii* from Vietnamese-sourced timber.

1.2 Results

Results are divided initially into two main sections: a basic legislation overview regarding the trade and use of *F. hodginsii* followed by actual numbers and figures of legal data. The results are provided according to category (e.g. quotas, violations, transport routes etc) rather than according to geography (province) for ease of comparison.

1.2.1 Overview of national legislation surrounding trade and use

1.2.1.1 National harvesting regulations for *Fokienia hodginsii*

Exploitation of the species *Fokienia hodginsii* in Vietnam is legally controlled by the Ministry of Forestry under Decree 18⁵ (see Box 1). Decree 18 was amended in 2002 under Decree 48⁶ ND – CP (Council of Ministers 2002) though the status of *Fokienia* remained unchanged (and remained unchanged under official dispatch 3399⁷ which corrected mistakes made in Decision 48). Under Decree 48 the use of *F. hodginsii* is restricted. Further to these Decrees, Decisions 02⁸ and 04⁹ (of MARD) were issued in 1999 and 2004 respectively (though Decree 04 is not yet in operation) which were aimed at regulating timber and forest product exploitation. These Decisions attempted to regulate (and clarify) the type of wood that can be extracted from forests (dead wood), and the approval mechanism through which such wood can be extracted.

Box 1. Council of Ministers (1992) Decree 18 HDBT of the Council of Ministers determining the list of rare and precious flora and fauna and regulations for their management and protection. Signed 17 January 1992, Hanoi.

Fokienia is listed as a class II species of 'flora that has high economic value and is over-exploited, leading to a state of depletion and danger of extinction.' Article 6 of the same Decree states that for Group II species (including *Fokienia*):

'exploitation and use is restricted, in concrete terms, as follows:[timber trees] may be exploited only at restricted levels according to species, number, and area, and the planned quotas for each year must be approved by the Chairman of the Council of Ministers, and written permission must be obtained from the Minister of Forestry. During exploitation, the procedures and technical standards of the Ministry of Forestry must be correctly implemented. This type of wood may be used only for special building projects of the state, in the production of handicrafts, or in high grade furniture to be used domestically and for export. The export of raw or partially processed wood is forbidden.'

Decree 18 (Article 12) states that 'The Ministry of Forestry has responsibility for organising the implementation, guidance, supervision and inspection for carrying out this Decree with all levels, sectors, organisations, and units through out the entire country; coordinating with all Ministries and sectors involved in creating and enforcing procedures and technical standards in the exploitation and use of rare and precious forest flora and fauna. Article 13 of the same decree states that 'The People's Committees at all levels are responsible for organising implementation and guidance, and for monitoring the execution of this Decree within their local areas of responsibility, under the general guidance of the Ministry of Forestry.'

⁵ Decree 18-HDBT dated 17/01/1992 *regulating the list of precious plants and animals and protection mechanisms.*

⁶ Decree 48/2002/ND – CP dated 22/04/2002 *amending and supplementing of the list of precious forest plant and animal species*

⁷ Official Dispatch 3399/2002/VPCP – NN *correcting errors in Decree 48*

⁸ Decision 02/1999/QĐ-BNN-KL dated 05/01/1999 *regulating timber and forest product harvesting*

⁹ Decision 04/2004/QĐ-BNN_KL dated 02/02/2004 *regulating timber and forest product harvesting*

Demand for the timber is high and, as can be seen from the Decrees and Decisions listed above, legally restricted. In legal terms there are only two methods of sale of *F. hodginsii*: through state sanctioned application by state bodies (and subsequent quota allocation), or through confiscation of illegally harvested timber. State sanctioned applications are made directly to the SFE (which is allowed to exploit *F. hodginsii* on behalf of the pPC) for planned exploitation, or the Department of Finance or provincial FPDs for the purchase of confiscated timber. It is not required for the applicant to approach either MARD or the pPC (though in practice, when large amounts of timber are required, many applications are made through the provincial People's Committee as transactions are often easier through this approach). Confiscated timber is also often put up for auction by the provincial FPD and such timber can also be purchased by local sawmills for the production of furniture or items such as doors, frames etc. This timber, once confiscated and auctioned, is provided with an official FPD stamp¹⁰.

Applications for harvest are made by the pPC who use harvesting of *F. hodginsii* as an income generating mechanism. Quotas are allocated by the government according to conformity of applications with the law as stated in Decision 02 (and Decision 04) and are not demand driven. In theory, therefore, a province can harvest the timber without previous orders from other pPCs. However, with such high demand for the wood it is rare in practice for purchase not to occur especially as timber prices are controlled by the pPCs themselves.

Once an application has been made for the purchase of *F. hodginsii* from a SFE, the SFE will produce documentation for permit application to the approval authorities. The provincial DARD then verifies and approves the application and submits to the provincial People's Committee. Following agreement by the pPC the application is submitted to MARD, further verified and approved and finally submitted to the Government. Upon agreement in writing from the Government, the pPC releases a decision for permitting the exploitation of the wood by the SFE (as per Decision 02). During exploitation and timber transportation the SFE activities are placed under the supervision of DARD, dFPD and the district Department of Forestry (see box 2 for further details).

Harvesting permission is usually provided by the government for a period of approximately 12 – 15 months (rarely longer in exceptional cases) as stated in Decision 02 (and Decision 04). If harvesting has not been completed within the allocated time then the pPC must submit another application asking for a harvesting extension.

Revenue derived from the sale of *F. hodginsii* goes directly from the pPC requesting the timber to the pPC of the province of extraction. However, it is necessary for the 'extracting' pPC to transfer funds in advance to the SFE for costs to be incurred during timber extraction.

As mentioned above only the state may harvest *F. hodginsii*. It is, therefore, technically illegal for local people living in or near *F. hodginsii* forest to harvest this timber for subsistence use (e.g. house building). However, in reality this illegal harvesting is very difficult to control and many of the state authorities (e.g. FPDs) 'turn a blind eye' if houses are constructed out of *F. hodginsii* timber. Theoretically, house builders using such timber should be fined, jailed or their assets seized. However, in most cases local people have neither finances nor assets with which to pay administrative fines, and a

¹⁰ According to Decision no. 69/2000/QĐ-BNN-KL dated 26/6/2001 on the *issuance of regulations of the management and use of tree cutting hammer and forest ranger hammer*.

prison sentence does not avoid the underlying necessity of house construction materials. In cases where it is clear that more than the requisite amount of timber for house building has been harvested then penalties are more usually enforced.

Box 2. Legal harvesting process for *F. hodginsii*

Once the SFE has received an order for a quantity of *F. hodginsii* the SFE must proceed through a process to apply for permission for harvest. This permission is ultimately provided by the Prime Minister of Vietnam. This process follows rules laid down in the Regulation of Timber and Forest Product Harvesting issues attached to Decision 02/1999/QĐ-BNN-PTLN dated 05/01/1999 of MARD:

- design the exploitation of *F. hodginsii* timber by:
 - harvesting only dying or dead trees that have died through fire, old age, pest or disease affliction;
 - clearly identifying harvest area demarcations;
 - measure, count and mark trees with a diameter at breast height (dbh) of greater than 25cm;
 - calculating the volume of the main product (trunk)
 - estimating the available amount of small usable timber pieces (other)
- produce a document outlining the above information

This process is conducted by the SFE but supervised by the provincial DARD which assesses field activities and produces a summary of the information. The documentation is forwarded (by the pDARD Director) to the pPC. It is the pPC who then submit the package to MARD.

MARD subsequently assign the Forest Development Department (FDD) (currently within the Department of Forestry) to verify the documentation through nationally available data. Should any discrepancy or irregularity be found then the FDD reports the problem to MARD and a field survey is conducted. If the application is in order then MARD submits the documentation to the Prime Minister (in theory) who then, upon the advisement of the Department of Agriculture (DoA), signs for harvesting permission.

Decision 02 also provides a mechanism to ensure no over-harvesting of *F. hodginsii*:

- Article 36: forest owners must supervise and regularly monitor harvesting activities and instruct the harvest following the approved harvest design, in cutting correctly identified trees, in complying with correct harvesting procedures and processes, and the harvesting of the correct volume and type of timber;
- Article 37: At harvest time expiration, the forest owners and harvesting units must conduct site checks, compare the results with the agreed documents and contract and make an overall assessment;
- Article 42: following the harvest time expiration, pDARD must close the forest and survey completed activities (often advised by the pFDD). Harvests must be inspected and officially documented (conducted by the pFDD in cooperation with the pFPD);
- Article 43: pFPD and dFPD must inspect the timber harvest and officially stamp the timber to prove legality. Violations that are discovered are charged by the FPDs according to current regulations (see Annex 3).

Notes:

- Harvesting permits are not granted in response to demand. Permits are only granted when the harvesting procedures are in line with the current State regulations; if the pPC documents are not according to current state regulations they may be rejected;
- MARD is the governing body which confirms correct harvesting procedures (based on silvicultural techniques, sustainable species development etc as outlined in the Regulation on Timber and Forest Product Harvesting attached to Decision 02).

1.2.1.2 International import and export of *Fokienia hodginsii*

Several legislation documents have been passed by the State prohibiting the commercial export trade of *F. hodginsii*.

Decision 664¹¹ on exportation of timber and forest products governed exports from 1995 until 2001. This decision outlined instructions on regulating product groups mainly produced from timber, and providing instruction on exportation procedures. It also prohibited the exportation of some types of timber, forest products and products processed from timber. Several other legislative documents were also produced (see box 3 for details) including Decision 821¹² specifically for *F. hodginsii* harvesting and derived products' export.

Decision 46¹³ provides guidelines on the import and export of goods (including timber and timber products) for the period 2001 – 2005. Under Decision 46, all logs and sawn timber from natural forest, firewood and charcoal from timber or firewood originating from natural forests (of all timber species including *Fokienia*) are banned for international export. No mention is made for processed wood materials (e.g. furniture etc.) nor does Decision 46 make provision for timber produced within plantations i.e. such timber is not banned for export. Decision 46 also allows the import of any timber.

F. hodginsii is not currently listed under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) (see <http://www.cites.org/>).

There is currently no legal international import or export of *F. hodginsii* timber in Vietnam.

¹¹ Decision no.664-TTg dated 18/10/1995 on *exportation of timber and forest products*.

¹² Decision no. 821-TTg dated 06/11/1996 on *F. hodginsii* wood products' harvest and exportation.

¹³ Decision 46/2001/QĐ – TTg dated 04/04/2001 on *commodity import and export management in 2001 – 2005*.

Box 3. Legislation on the import and export of *F. hodginsii* and derived products from 1995 to 2005

Decision no.664-TTg dated 18/10/1995 of the Prime Minister on exportation of timber and forest products governed exports from 1995 until 2001. It prohibited the exportation of some types of timber, forest products and products processed from timber including:

- Timber logs of all types (Clause 2, article 2);
- All part processed or non-processed lumber (planks) of all types and sizes (Clause 3, article 2);
- Fine processed timber floor boards of timber from group IIA (including *F. hodginsii*) (Clause 7, article 2).

Inter ministerial Circular of MARD – MOT – General Department of Customs no. 01-TTLB dated 22/12/1995 guiding the implementation of Decision no.664

- Clear explanation of various types of timber, timber products and other forest products prohibited for export;
- Clear explanation of various types of timber, timber products and other forest products requiring permit from MARD for customs clearance;
- Regulations on the application for the export of permitted timber, timber products and other forest products
- Regulations on customs clearance procedures

Decision no.821-TTg dated 06/11/1996 of the Prime Minister on *F. hodginsii* harvesting and related products exportation.

- Forest containing *F. hodginsii* closed for general exploitation;
- MARD assigned to instruct localities with *F. hodginsii*-containing forest in their management and protection, and the administering of violation penalties;
- Regulations produced on the treatment of *F. hodginsii* timber and related products;
- Final products must correspond to the standards and criteria outlined in Decision 664 for export; those not corresponding to Decision 664 but still corresponding to Decision 624 must be inventoried (quantity and types);
- *F. hodginsii* logs, pre-processed and processed timber inventoried (and not further processed until MARD produced government-sanctioned solutions for their use.

Decision no.46/2001/QĐ-TTg dated 04/4/2001 of the Prime Minister on the management of commodity export and import in 2001 – 2005.

- List of commodities prohibited for export, including timber logs and lumber (planks) from national natural forests;
- List of commodities under the professional management of MARD, including rare forest plants.

Circular no. 62/2001/TT-BNN&PTNT dated 05/6/2001 of MARD guiding import-export of commodities under the professional management of MARD according to Decision no. 46 (see below for details).

Circular no. 72/2001/TT-BNN dated 09/7/2001 of MARD amending and supplementing Circular no. 62.

- Prohibiting the export of timber logs and lumber (planks) from national natural forests;
- Products produced from rare and precious timber in group IIA (Decree 48) are only permitted for export in the forms of handicraft and superior quality wood furniture; border gate customs clearance procedures required for export.

1.2.2 Current distribution of *Fokienia hodginsii* in Lao Cai and Son La

Lao Cai

According to a report produced in 1996 by the Forest Inventory and Planning Institute (FIPI 1996) Lao Cai province had four districts with populations of *F. hodginsii* (Bat Sat, Sa Pa, Van Ban and Than Uyen districts). However, 2004 records maintained at Lao Cai provincial FPD state that *F. hodginsii* is now only established in 14 communes of two districts of the province: Van Ban district which contains 53,947 ha of natural forest land (in seven communes) and Sa Pa district which has 23,603 ha of natural forest land (in seven communes). Annex 3 provides further details.

Son La

2004 records maintained at Son La provincial FPD state that *F. hodginsii* was then established in 17 communes of six districts of the province: Thuan Chau district which contains 11,901.87ha of natural forest land (in two communes), Moc Chau with 23,328.84ha (in two communes), Phu Yen with 8,157.40ha (in two communes), Muong La with 40,608.99ha (in six communes), Bac Yen with 15,895.22ha (in three communes) and Mai Son with 7,371.17ha (in two communes). Annex 3 provides further details.

1.2.3 Legal logging quotas

Van Ban State Forest Enterprise

Van Ban SFE is the only SFE in Lao Cai province that has been granted permission for the legal harvesting of *F. hodginsii* timber since 2001. Van Ban SFE, which was established in 1992, is assigned to manage 19,112.6 ha of forest land, of which 847 ha comprise plantation forest and 18,265.6 ha natural forest. Permission is granted by Lao Cai People's Committee to the SFE to harvest a maximum of 2,000 m³ logs from natural forest annually; as well as logs, the SFE has been allowed to harvest 6,512.8 m³ of other timber (branches) and 2,069.4 tons of *F. hodginsii* roots. However, the actual amount of wood harvested is much less and has been restricted due to difficulties in extraction (poor and limited transportation in remote areas combined with harsh topographical (and weather) conditions. In total only approximately 1,778 m³ of sawn timber has been legally harvested to date with approx. 177 tons of roots (see Table 2 for details).

Table 2: Details of quotas, communes and areas of extraction, actual amounts of extraction and provincial government decisions providing permission for extraction of *F. hodginsii* for Van Ban SFE (Lao Cai province)

Year	Permitted quota		Actual amounts extracted		Communes of extraction	Extraction area (ha)	Provincial Government Decision
	Timber (m ³)	Roots (tons)	Timber (m ³)	Roots (tons)			
2002	1,205.5	2,069.4	262.7	31.6	Khanh Yen Ha Liem Phu Nam Tha Duong Quy	253.0	287/QDUB 15/07/2002
2003	1,729.0	0	870.8	145.3	Khanh Yen Ha, Liem Phu Duong Quy	263.0	599/QDUB 23/12/2003
2004	2,483.3	0	213.6	0	Khanh Yen Ha, Liem Phu Duong Quy Khanh Yen Trung Nam Tha Nam Xe	221.6	342/QDUB 22/12/2004
2005	1,095.0	0	430.8*	0	Khanh Yen Ha Liem Phu Duong Quy Khanh Yen Trung Nam Tha Nam Xe	104.8	369/QDUB 20/07/2005
Total	6,512.8	2,069.4	1,777.9	176.9			

Source: Lao Cai FPD

* = until October 2005

Due to complicated topography and difficulties in extraction the actual amounts of timber extracted is much lower than the quota provided. Overall only 27.3% of the total extraction quota for timber, and 8.5% for roots, has been achieved.

Muong La (Muong Bu) and Phu Yen State Forest Enterprises

Son La province contains five SFEs: Muong La, Phu Yen, Moc Chau, Song Ma, and Song Ma Special Products, but of these only Muong La and Phu Yen SFEs have been given permission to harvest *F. hodginsii* timber legally. Following field surveys, harvesting design and approval by various authorities (See section 1.2.1.1 and Box 2) the provincial PC agreed in 2001 to the harvesting of 4,394.9 m³ of *F. hodginsii*¹⁴ from Muong La and Phu Yen SFEs. An annual harvest quota was not provided and the figure provided was for the total quota over the five years. Correspondingly, annual harvesting figures were not recorded; rather extraction was continuous in the permitted areas until the quotas for those areas had been reached. Between 2001 and October 2005 the SFEs have, between them, harvested 4,394.94 m³ of *F. hodginsii* timber. Of this total amount, Muong La has harvested 2,833.0 m³ and Phu Yen SFE 1,562.0 m³ (see Table 3 for details).

¹⁴ According to Decision 3610/QĐUB of the province dated 17/8/2001 on *harvesting quotas for Son La province*.

Table 3: Details of communal quotas and actual amounts of extraction of *F. hodginsii*, and the date of completed extraction for Muong La and Phu Yen SFEs (Son La province)

SFE	Commune	Quota (m ³)	Actual amount extracted (m ³)	Notes
Muong La	Nam Pam	458.4	458.4	Completed in 2004
	Ngoc Chien	585.4	585.4	
	Hua Trai	417.0	417.0	
	Chieng Cong	490.5	490.5	Completed in 2005
	Chieng An	509.7	509.7	
	Chieng Muon	372.0	0	Not undertaken*
	Muong La total	2,833.0	2,256.0	
Phu Yen	Suoi To	1,038.0	776.3	Completed in 2002**
	Muong Thai	533.0	282.7	
	Phu Yen total	1,571.0	1,059.0	
Grand total		4,394.9	3,314.9	

Source: Son La FPD

* = extraction not undertaken due to difficult topography and transportation; ** = extraction finished

Due to complicated topography and difficulties in extraction the actual amounts of timber extracted from several communes (Chieng Muon in Muong La district and Suoi To and Muong Thai in Phu Yen district) is lower than the quota provided. Overall only 75.4% of the total extraction quota has been achieved (79.6% from Muong La SFE and 67.8% from Phu Yen SFE).

1.2.4 Timber confiscations

Lao Cai province

The provincial Lao Cai FPD includes a staff of 10 rangers, two forest product checking stations and one mobile task force. In recent years, the provincial FPD has processed numerous cases regarding violation of forestry law with most violations involving illegal timber transportation, trade and the exploitation of forest products (see Table 4).

Table 4a: Summary of violation cases of the forestry law in Lao Cai from 2001 – Oct. 2005

Violation description	Unit	Year				
		2001	2002	2003	2004	10/2005
Illegal harvesting	Case	80	79	97	52	41
Deforestation	Case	17	22	22	29	20
Forest burning	Case	5	14	53	9	17
Illegal trade	Case	449	337	472	328	235
Illegal storage and processing	Case	1	23	43	13	15
Other	Case	0	0	10	12	7
Total number of violations		552	475	697	443	335

Source: Lao Cai FPD

Table 4b: Table showing number of penalties per penalty type for violations in Lao Cai from 2001 – Oct. 2005

Penalty type	Unit	Year				
		2001	2002	2003	2004	10/2005
Administrative	Case	417	339	672	469	365
Cash fine	1,000 VND	296.1	248.6	572.3	518.8	419.1
Timber confiscation	m ³ logs	139.5	108.6	352.4	213.0	119.7
	m ³ planks	219.6	42.6	251.2	291.0	170.8
Criminal	Case	7	7	6	0	0
Total number of penalties administered		424	346	678	469	365

Source: Lao Cai FPD

Notes:

Figures in Table 4b may include the previous years discovered violation cases without charge (for some violation cases the duration for punishment can be prolonged to 60 days therefore the cases discovered at the end of previous year were counted as the next year charged violation cases).

Data in Tables 4a and b are forestry violations for timber in general. Data specifically for districts were not available at the provincial level at the time of this survey. For data regarding *F. hodginsii* confiscations in Van Ban see Table 5.

Figure 2: Confiscated *F. hodginsii* timber held at Van Ban FPD



Photo: Le Quang Trung/FFI

Van Ban district

According to information maintained at Van Ban FPD 143 violation cases related to *F. hodginsii* were recorded between 2001 – October 2005. In total, 2.02 m³ of logs and 116.95 m³ planks were confiscated (see Figure 2), with fines totaling 156,289,000 VND. The most common violation recorded was illegal *F. hodginsii* timber transportation while recorded cases of illegal harvesting were small. Recorded violation cases in general in recent years have not been severe with administrative fines only being distributed to violators (see Table 5); no recorded cases have warranted criminal charges since 2001. Penalty delimitations are provided in Annex 4.

Table 5: Summary of violations related to *F. hodginsii* timber recorded at Van Ban FPD from 2001 - 10/2005

Year	Violation type				Total no. violations	Timber volume confiscated		Fine (1,000 VND)
	Illegal harvesting	Illegal transportation	Illegal processing	Illegal storage		Log (m ³)	Planks (m ³)	
2001	4	31	1	0	36	-	41.51	36,194
2002	2	30	6	0	38	-	28.46	22,440
2003	5	26	1	0	32	0.10	24.40	34,150
2004	3	17	2	0	22	1.92	14.32	17,036
10/2005	0	14	1	0	15	-	8.26	46,469
Total	14	118	11	0	143	2.02	116.95	156,289

Source: Van Ban FPD

Son La province

Son La FPD includes of 10 forest protection rangers, one forest product checking station and one mobile task force. In recent years, the provincial FPD has processed numerous cases regarding violation of forestry law with most violations involving illegal timber transportation, trade and the storage of *F. hodginsii* timber. Although the number of recorded violations in 2005 is reduced in general serious violations i.e. those punishable with prison sentences, have been on the increase reflecting the serious situation of *F. hodginsii* exploitation within the province (see Table 6a and b for details).

Table 6a: Summary of violation cases of the forestry law in Son La from 2001 – Oct. 2005

Violation description	Unit	Year				
		2001	2002	2003	2004	10/2005
Illegal harvesting	Case	204	174	164	154	113
Deforestation	Case	207	258	269	374	216
Forest burning	Case	16	9	29	57	65
Illegal trade	Case	585	520	606	578	203
Illegal storage and processing	Case	146	141	112	144	85
Other	Case	11	12	20	44	33
Total number of violations		1,169	1,114	1,200	1,351	715

Source: Lao Cai FPD

Table 6b: Table showing number of penalties per penalty type for violations in Son La from 2001 – Oct. 2005

Penalty type	Unit	Year				
		2001	2002	2003	2004	10/2005
Administrative	Case	1,095	1,057	1,187	1,291	623
Cash fine	1,000 VND	918.0	1,214.1	n/a	1,756.7	986.5
Timber confiscation	m ³	520.5	649.1	n/a	951.0	470.7
Criminal	Case	0	9	9	13	12
Total number of cases		424	346	678	469	365

Source: Son La FPD

n/a = data not available

Data in Tables 6a and b are forestry violations for timber in general. Data specifically for districts were not available at the provincial level at the time of this survey. For data regarding *F. hodginsii* confiscations in Muong La and Bac Yen see Table 7.

Muong La district

According to information maintained at Muong La FPD 71 violation cases related to *F. hodginsii* were recorded between 2001 – October 2005 (see Table 7). In total, 51.48 m³ timber was confiscated, with fines given out totaling 66,600,000 VND. The most common violation recorded was illegal *F. hodginsii* timber transportation and harvesting. Recorded violation cases in general in recent years have not been severe with administrative fines only being distributed to violators; no recorded cases have warranted criminal charges since 2001. Penalty delimitations are provided in Annex 4.

Bac Yen district

Bac Yen district lies to the North-east of Son La Town. According to 2005 records (UBND Bac Yen 2005) the natural area covered by the district was 109,092.4 ha. Of this forest land constitutes 71,894.4 ha (natural forest was 38,622.4 ha, planted forest was 533.2 ha and unplanted (bare) land was 32,838.8 ha) with a total forest coverage of 35.8%. Forest coverage in Bac Yen district was one of the largest of all districts in Son La province. The district has 13 communes and one township. Bac Yen district currently (in 2004) maintains 18,076.0 ha of forests and forest lands belonging to the Ta Xua nature reserve management board (which also manages contiguous nature reserve forest in Phu Yen district). According to the same survey (UBND Bac Yen 2005) the natural forest area that contains *F. hodginsii* was 15,895.2 ha allocated in three communes (see Annex 3).

According to information maintained at Bac Yen FPD 73 violation cases related to *F. hodginsii* were recorded between 2001 – October 2005 (see Table 7). In total, 234.0 m³ logs and 57.2 m³ of planks were confiscated, with fines given out totaling 221,768,000 VND. The most common violation recorded was illegal *F. hodginsii* timber transportation and harvesting. Recorded violation cases in general in recent years have not been severe with administrative fines only being distributed to violators; no recorded cases have warranted criminal charges since 2001. Penalty delimitations are provided in Annex 3.

It should be noted that the living standards of local people living close to the *F. hodginsii* forests in Bac Yen is very low. The majority of farmers are H'mong with some Thai, Muong and Dao ethnic groups. Between 2001 and 2003 local farmers burned over 10 ha of *F. hodginsii* forest to provide land for crop cultivation. Most other *F. hodginsii* harvests recorded (by Bac Yen FPD) are small-scale, conducted mainly by individual households, and transported by manpower by forest tracks to Phu Yen district (particularly Suoi To, Ao Ho and Suoi Sat communes) where the timber is sold to timber barons. Other details are provided in Table 7 below.

Table 7: Summary of violations related to *F. hodginsii* timber recorded at Muong La and Bac Yen FPDs from 2001 - 10/2005

District	Year	Violation type				Total no. violations	Timber volume confiscated		Fine (1,000 VND)
		Illegal harvesting	Illegal transportation	Illegal processing	Illegal storage		Log (m ³)	Planks (m ³)	
Muong La	2001	0	2	0	0	2	0	1.5	4,700
	2002	7	7	0	0	14	0	14.2	1,400
	2003	2	2	0	9	13	0	5.73	6,270
	2004	5	12	8	1	26	0	23.3	28,170
	10/2005	3	8	4	1	16	0	6.8	26,060
	Total	17	31	12	11	71	0	51.5	66,600
Bac Yen	2001	8	1	0	0	9	40.9	0.1	174,630
	2002	9	2	5	0	16	134.3	11.6	27,000
	2003	12	4	0	1	17	58.8	14.8	2,351
	2004	6	12	0	2	20	0	22.7	8,037
	10/2005	1	5	0	4	10	0	8.1	9,750
	Total	36	24	5	7	72	234.0	57.2	221,768

Source: Muong La and Bac Yen FPDs

1.2.5 Timber imports

1.2.5.1 National imports

F. hodginsii timber or timber products are not currently imported into either Son La or Lao Cai provinces from any other province within Vietnam.

1.2.5.2 International Imports

Son La has two major border crossings with Laos: Pa Hang (Moc Chau district) and Chieng Khuong (Song Ma district); Lao Cai has only one major border crossing: Lao Cai City. *F. hodginsii* timber or timber products are not currently legally imported into either Son La or Lao Cai provinces from any other country (i.e. China or Laos) – see section 1.2.1.2 for legislation regarding imports and exports of *F. hodginsii* wood.

1.2.6 Plantations

At present, Van Ban is administering a *F. hodginsii* restocking programme. However the area is not significant, with trees still small. No further data are available.

Son La, to date, does not currently have any *F. hodginsii* plantation plans.

1.2.7 Processing workshops and transport routes

In general, together with the socio-economic development of the country, national transportation routes are increasingly developed. Timber and wood products are transported by road, waterways and even by trains (e.g. between Hanoi and Lao Cai). However, the transportation system in the surveyed districts is still limited, especially at the communal level. Timber is harvested from the forests through the use of manual saws, and then conveyed by buffalo or manpower to roadways where it is then uploaded onto motorbikes, cars, buses, trucks or boats. Harvesting sites are normally far from these uploading sites, often in areas of difficult terrain, and local transportation faces many challenges.

The socio-economic conditions of the surveyed districts are generally poorly developed (see Annex 6). Private forest product processing facilities are usually poorly equipped, few in number, of a relatively low capacity and produce fairly simple products for local subsistence use.

Van Ban District

Transportation routes

- Road:

- o National road no. 279 is 70 km long, and connects Bao Yen and Than Uyen districts (Lai Chau province);
- o Inter provincial road no. 79 is about 20 km long, from Xuan Giao junction (Bao Thang Bridge) to Khe Lech bridge;
- o Inter communal road is about 50 km long, with large parts of the road being soil based; many sections of the road also have steep slopes making traveling, especially during the rainy season, very difficult.

- Waterways:

- o The Cham Stream is 30 km long; it originates from Sa Pa district and flows down to Bao Thang (Ngoi Nhu);
- o The Nhu Stream is about 50 km long; it originates from Van Yen (Yen Bai province) and flows to Khe Chan Bridge (Cham Stream).

Timber processing facilities

Van Ban SFE has one timber processing workshop in the township and one 'rough' paper production workshop. In addition the district has six timber processing units:

- Quyet thang forest product processing cooperative, in Khanh Yen township;
- Bao Ngoc forest product processing cooperative, in Khanh Yen Thuong commune;
- Huy Quang carpenter shop, in Khanh Yen Thuong commune;
- Ha Chien carpenter shop, in Khanh Yen township;
- Bug Canh timber saw workshop, in Lang Giang commune;
- Viet Tuyen Ltd., in Vo Lao commune.

Of the six timber processing units only two have chain saws (Huy Quang carpenter shop and Ha Chien carpenter shop); all units have only one disk saw each of with low capacity.

Muong La District

Transportation routes

- Roads:
 - o National road no. 6 is about 230 km long, from Thuan Chau town to Mai Son, Yen Chau and Moc Chau;
 - o Inter provincial road no. 37 is about 120 km long, connecting with Road no. 6 to Yen Chau, Bac Yen, Phu Yen and Thanh Son (Phu Thọ province) districts;
 - o Two inter district roads: Quynh Nhai road to National road no. 6 is about 70 km; Road 4G connects Road no. 105 (Ma River) with Road no. 6 and is about 100 km.
- Waterways:
 - o The Da River is about 250 km long, from Lai Chau province flowing through Son La (Quynh Nhai, Muong La, Bac Yen, Moc Chau and Phu Yen districts) down to Hoa Binh province;
 - o The Ma River is about 120 km, from Lai Chau through Song Ma district to the People's Democratic Republic of Laos.

Timber processing facilities

Muong La district has 10 timber processing units, two of which have chain saws, with the rest of the units employing multifunctional saws from China. The timber processing units have all been issued with forest product import-export recording books by the district FPD though the books appear not to be updated regularly; data regarding *F. hodginsii* was missing from all books from the 10 units. The 10 legal timber processing units in the district are:

- Luong Dai Dung timber processing workshop in Nam Pam, a part of the Son La forest product processing company;
- Nguyen Dac Xuan timber processing workshop in the former Ban Dang ferry, a part of the Song Da material production company no. 12;
- three timber processing shops in sub quarter no. 1: Nguyen Tien Thu, Cao Van Giang and Bui Hung Manh;
- two timber processing shops in sub quarter no. 2: Le Minh Hieu and Tran Van Bong;
- Wood processing workshop of Mr. Nguyen Van Kien in sub quarter no. 3;
- two timber processing shops in sub quarter no. 4: Nguyen Ngọc Sang and Bui Van Phong.

Bac Yen District

Transportation routes

- Roads:
 - o Road no. 12. is interdistrict road linking from Road no. 6 passing Bac Yen to Phu Yen;
- Waterways:
 - o Da River flowing through Muong La, Bac Yen, Moc Chau to Hoa Binh province.

Timber processing facilities

Bac Yen District does not contain any legal timber processing workshops; the district has just four small carpenter shops which use small disk saws and planers to make utensils and furniture for local subsistent use only. These shops are still provided timber import-export recording books by the district FPD though there is no information available on whether or not these books are maintained:

- Shop of Mr. Nguyen Van Quy and Mr. Nguyen Van Hung, in sub quarter no. 2 of Bac Yen township;
- Shop of Mr. Vuong Van Cuong, in Phieng Bang 1, Bac Yen;
- Shop of Mr. Nguyen Van Mạnh, in Phieng Bang 3, Bac Yen.

1.2.8 Provincial export of *F. hodginsii*

F. hodginsii is listed as a precious wood within group IIA of Decree 48. As such, when the timber of *F. hodginsii* is exported from the province of origin, special transportation permits are required; these permits are issued by the provincial FPD. Statistical data (supplied by the Lao Cai and Son La FPDs) regarding the legal transport of *F. hodginsii* out of Lao Cai and Son La provinces are provided below.

Lao Cai Province

After legal harvesting the timber is transported to Van Ban SFE or the town processing workshops by truck and processed. Timber exported out of Van Ban SFE is in the form of sawn wood.

Timber sold to other provinces in Vietnam consist of both legally harvested wood and confiscated timber; however, in Lao Cai most confiscated wood is auctioned locally with only approx. 2.1% of the total provincial export of *F. hodginsii* consisting of confiscated timber (see Table 8). Auction prices are provided in Table 13, section 2.4).

Table 8: Summary of special transportation permits for *F. hodginsii* granted by Lao Cai FPD from 2001 to 2005

Year	Origin of export	Destination	Source	
			Legal harvest (m ³)	Confiscation (m ³)
2001	Van Ban SFE	Hanoi	172.90	
	Van Ban SFE	Vinh Phuc	90.38	
	Van Ban SFE	Hai Phong	66.45	
			Total: 329.72	
2002	Van Ban SFE	Hanoi	108.47	
	Van Ban SFE	Vinh Phuc	49.62	
			Total: 158.09	
2003	Van Ban SFE	Hanoi	457.96	9.60
	Township	Hanoi		20.80
	Van Ban SFE	Hai Phong	2.22	
	Van Ban SFE	Hai Duong	31.25	
	Van Ban SFE	Vinh Yen	1.49	
	Van Ban SFE	Vinh Phuc	67.68	
			Total: 591.00	
2004	Van Ban SFE	Hanoi	204.76	
	Van Ban SFE	Quang Ninh	38.07	
	Van Ban SFE	Hai Phong	26.28	
	Van Ban SFE	Nam Dinh		2.54
	Township	Ha Nam		0.73
			Total: 272.38	

2005	Van Ban SFE	Hanoi	215.86	
	Van Ban SFE	Hai Phong	37.26	
	Van Ban SFE	Thai Nguyen	1.49	
	Van Ban SFE	Hai Duong	1.50	
	Van Ban SFE	Hung Yen	1.61	
	Township	Ha Tay	2.11	
			Total: 259.83	
Total			Grand total: 1,611.34	

Source: Lao Cai FPD

The total volume of *F. hodginsii* timber transported out of Lao Cai province from 2001-2005 was 1,611.01 m³ planks, of which legally harvested timber constituted 1,577.34 m³ and timber from confiscations amounted to 33.68 m³ planks. Timber was mainly transported mainly to Hanoi, Vinh Phuc and Hai Phong (see Table 9).

Table 9: Volumes of *F. hodginsii* timber from Lao Cai and their destinations from 2001 - 10/2005

No.	Destination	Volume (m ³ planks)		
		Confiscation	Legal harvest	Total
1	Hanoi	30.40	1,159.94	1,190.35
2	Vinh Phuc		209.26	209.26
3	Hai Phong		132.20	132.20
4	Hai Duong		32.75	32.75
5	Quang Ninh		38.07	38.07
6	Nam Dinh	2.54		2.54
7	Ha Nam	0.73		0.73
8	Hung Yen		1.61	1.61
9	Ha Tay		2.11	2.11
10	Thai Nguyen		1.49	1.49
	Total	33.68	1,577.34	1,611.01

Source: Lao Cai FPD

Son La Province

After legal harvesting the timber is transported to the SFEs and district centres by truck and processed. Timber exported out of the districts is in the form of sawn wood.

In Son La confiscated wood makes up approx. 17.2% of the provincial export of *F. hodginsii* timber most of which comes from Bac Yen and Phu Yen districts with the other districts auctioning timber locally (see Table 10). Auction prices are provided in Table 13, section 2.4).

Table 10: Summary of special transportation permits for *F. hodginsii* granted by Son La FPD from 2001 to 2005

Year	Origin of export	Destination	Source	
			Legal harvest (m ³)	Confiscation (m ³)
2001	Phu Yen	Hai Phong		5.02
	Son La	Hanoi	146.66	
	Muong La	Hanoi	9.60	
	Bac Yen	Vinh Phuc		8.05
	Phu Yen	Hanoi		3.46
			Total: 172.79	
2002	Son La	Hanoi	237.14	
	Phu Yen	Phu Thọ		9.67
	Phu Yen	Vinh Phuc		7.60
	Phu Yen	Ha Tay		5.06
	Phu Yen	Hung Yen		1.00
	Phu Yen	Hanoi		1.00
	Bac Yen	Ha Tay		30.96
	Bac Yen	Thai Binh		11.06
	Bac Yen	Hanoi		6.29
	Bac Yen	Vinh Phuc		6.79
			Total: 316.58	
2003	Phu Yen	Hoa Binh	8.00	3.00
	Phu Yen	Bac Ninh		1.70
	Phu Yen	Hanoi	154.01	11.70
	Phu Yen	Phu Thọ	25.62	10.48
	Phu Yen	Vinh Phuc	38.02	6.54
	Son La	Hanoi	442.27	1.05
	Bac Yen	Phu Thọ		34.71
	Bac Yen	Hanoi		8.98
	Bac Yen	Vinh Phuc		8.96
	Bac Yen	Ha Tay		8.58
	Thuan Chau	Hanoi		1.35
	Moc Chau	Hanoi		5.97
			Total 770.93	
2004	Son La	Hanoi	237.14	
	Phu Yen	Vinh Phuc		14.39
	Phu Yen	Phu Thọ		9.67
	Phu Yen	Hung Yen		1.00
	Phu Yen	Hanoi		1.00
	Phu Yen	Ha Tay		5.06
	Bac Yen	Ha Tay		30.96
	Bac Yen	Thai Binh		11.06
	Bac Yen	Vinh Phuc		6.79
	Bac Yen	Hanoi		6.29
			Total: 323.37	
2005	Phu Yen	Hai Phong		5.02
	Son La	Hanoi	146.66	
	Phu Yen	Hanoi		3.46
	Muong La	Hanoi	9.60	
	Bac Yen	Vinh Phuc		8.05
			Total: 172.79	
Total			Grand total: 1,756.46	

Source: Son La FPD

The total volume of *F. hodginsii* timber transported out of Son La province from 2001-2005 was 1,756.46 m³ planks, of which legally harvested timber constituted 1,454.73 m³ and timber from confiscations amounted to 301.73 m³ planks. Timber was mainly transported mainly to Hanoi, Hai Phong and Vinh Phuc (see Table 11).

Table 11: Volumes of *F. hodginsii* timber from Son La and their destinations from 2001 - 10/2005

No.	Destination	Volume (m ³ planks)		
		Confiscation	Legal harvest	Total
1	Hanoi	50.55	1,383.09	1,433.63
2	Hai Phong	10.04		10.04
3	Vinh Phuc	67.18	38.02	97.20
4	Phu Thọ	64.52	25.62	90.14
5	Ha Tay	80.62		80.62
6	Hung Yen	2.00		2.00
7	Thai Binh	22.12		22.12
8	Hoa Binh	3.00	8.00	11.00
9	Bac Ninh	1.70		1.70
	Total:	301.73	1,454.73	1,756.46

Source: Son La FPD

1.2.9 Timber demand

Lao Cai province

Actual amounts of legally harvested *F. hodginsii* timber extracted from 2001 – November 2005 from Lao Cai province was 1,777.89 m³. *F. hodginsii* timber legally d in the province amounted to 200.55 m³ or approx. 11.3%, whilst the remainder, 1,577.34 m³ or approx. 88.7%, was exported out of the province.

Confiscated *F. hodginsii* timber exported out of the province amounted to 33.68 m³ of planks and all originated from Van Ban (Van Ban FPD confiscated 116.95 m³ of planks and 2.02 m³ logs).

Son La province

Actual amounts of legally harvested *F. hodginsii* timber extracted from 2001 – November 2005 from Son La province was 3,314.91 m³, or 2,071.82 m³ planks (when processing wood it requires approx. 1.6 m³ of log to produce 1 m³ of plank). Legally harvested *F. hodginsii* timber d in the province amounted to 617.09 m³ or approx. 29.8%, whilst the remainder, 1,454.73 m³ or approx. 70.2%, was exported out of the province.

Confiscated *F. hodginsii* timber exported out of the province amounted to 301.73 m³ of planks, mainly from the districts of Phu Yen and Bac Yen. Muong La FPD confiscated 51.48 m³ of planks and logs but did not export out of the provinces. Bac Yen FPD confiscated 57.18 m³ planks and 234.00 m³ logs, of which 191.00 m³ was exported out of the province.

1.3 Summary of the legal trade of *F. hodginsii*

Exploitation of *F. hodginsii* is controlled under national Decrees 18 and 48 which state that the use of this timber is restricted. These decrees also state that quotas for the harvesting of this timber must be agreed previously by the Chairman of the Council of Ministers and currently by the Prime Minister. Quotas are provided to pPCs while SFEs actually undertake harvesting. The legal process of *F. hodginsii* harvesting is detailed in ministerial Decisions 02 and 04 which also state that only 'dead or dying' wood may be harvested.

A summary of data regarding quotas, violations and national export volumes of *F. hodginsii* in Van Ban, and Muong La and Bac Yen districts is provided in Table 12.

Table 12: Summary of data regarding quotas, violations and national export volumes of *F. hodginsii* in Van Ban, and Muong La and Bac Yen districts from 2001 – 2005.

Data type	District			
	Van Ban	Muong La	Bac Yen	Phu Yen
Total quota (m ³)	8,222.2	2,833.0	0	1,571.0
Actual volume extracted (m ³)	1,954.8	2,256.0	0	1,059.0
Number of violations	143	71	72	n/a
Most common violation	Illegal transportation	Illegal transportation	Illegal harvesting	n/a
Volume timber confiscated (m ³)	119.0	51.5	291.2	n/a
Total amount of fines (VND)	>156,000,000	> 66,000,000	> 221,000,000	n/a
Total provincial volume exported (m ³)	1,611.0 (Lao Cai)	1,756.5 (Son La)		

Notes:

n/a – information not collected

Harvesting of *F. hodginsii* in Lao Cai province is undertaken exclusively by Van Ban SFE; the total quota allocated to Lao Cai PC since 2001 amounts to 6,152.8 m³ of logs and 2,069.4 m³ of roots. Of this quota, only 1,777.9 m³ (29%) of logs and 176.9 m³ (9%) of roots have been harvested to date due to forest access and extraction difficulties. Harvesting of *F. hodginsii* timber in Son La province is undertaken by Muong La and Phu Yen SFEs; the total allocated to Son La PC since 2001 amounts to 4,394.9 m³, of which 3,314.9 m³ (75%) has been harvested to date, again due to forest access and extraction difficulties.

Violations in forestry law are punishable by fines and/or criminal proceedings (i.e. imprisonment). Where *F. hodginsii* timber is concerned such timber is also confiscated by the FPD. Of 2,502 forestry violations in Lao Cai since 2001, 143 (or approx. 6%) have been *F. hodginsii*-related from Van Ban alone. Within these 143 violations, 2.02 m³ of

logs and 116.95 m³ of planks have been confiscated, with fines exceeding 156,000,000 VND administered. Most of these violations were of illegal transportation.

In Son La 5,549 forestry violations have been recorded since 2001 with 143 (or approx. 3%) being *F. hodginsii*-related from Muong La and Bac Yen alone. Within these violations 234 m³ of logs (from Bac Yen alone – none from Muong La) and 108.7 m³ planks have been confiscated, with fines exceeding 288,000,000 VND administered (the majority from Bac Yen district). Most *F. hodginsii*-related violations in Muong La were of illegal transportation while most in Bac Yen were due to illegal harvesting.

National export (i.e. to provinces outside the province of extraction) is currently governed by Decision 02. Export of *F. hodginsii* timber from Son La province since 2001 amounted to 1,756.5 m³ of which 301.7 m³ was confiscated timber and 1,454.7 m³ legally harvested timber. Export of the wood from Lao Cai province since 2001 amounted to 1,611.0 m³ of which 33.7 m³ was confiscated timber and 1,577.3 m³ legally harvested timber.

Timber is harvested and collected by the relevant SFE and transported, often using manpower or buffalo, to registered sawmills where logs may be pre-processed. The timber is then transported to the purchasing provinces via numerous roadways (commonly) and waterways (rarely).

International import and export of *F. hodginsii* timber is regulated by Decision 46. Currently there is no legal international import or export in this wood.

Figure 3: Confiscated *F. hodginsii* wood is often auctioned and used in construction



Photo: Do Thi Thu Ha

Illegal trade of *Fokienia hodginsii*

Nguyen Van Duong¹, Le Duy Tan¹, Lo Van Thanh² and Leo Van Bien²

¹Lao Cai Forest Protection Department and ²Son La Forest Protection Department

2.1 Introduction

FFI's HLS Project works in Van Ban district and Muong La district of Lao Cai and Son La provinces respectively. Research into the illegal trade and use of *Fokienia hodginsii* was planned to occur in these two district centres. However, permission was not given by the Son La People's Committee to conduct survey work on the illegal trade of *F. hodginsii* timber in Muong La ostensibly due to issues surrounding the construction of the new Ta Bu hydropower dam, particularly with regards the relocation of local people living in the flood-area; nor was permission given by Lao Cai People's Committee to work in Van Ban due to reasons unknown. Within Son La province the research team was permitted to conduct research in Bac Yen district, with some small information gathering in Son La town and Phu Yen district. There was no permission provided for survey work anywhere within Lao Cai province; however, some information was acquired by chance in Van Ban.

The following results are provided by geographical location for convenience. Survey areas as outlined in the results are shown in Maps 2 and 3. Initially very limited work was undertaken in Son La provincial town. Subsequently, the survey team moved to Bac Yen district. Information gathered in Bac Yen also inferred that some timber was exported through Phu Yen district; the survey team also traveled to Phu Yen to gather what information they could. The survey team was not given permission by the pPC to conduct surveys into the illegal trade and use of *F. hodginsii* within Lao Cai province. As a result, the survey team was limited to gathering information on legal use. Such information is incorporated into Section 1.

Bac Yen is a small, highland district of Son La province. Its natural area covers 109,800 ha with a population of over 50,000 people. The major ethnic group of the district is H'mong accounting for approximately 50% of the district's population but concentrated away from the town centres. In reference to statistical data from 1995, forest areas with *F. hodginsii* trees was approx. 5,000 ha, concentrated mainly in three communes: Ta Xua, Xim Vang and Hang Chu (UBND Bac Yen district 1995). Unlike Muong La and Phu Yen districts there is no State Forest Enterprise (SFE) active in Bac Yen district.

Surveys were carried out in Phu Yen for only a short period of time (2 days). The decision to survey Phu Yen district resulted from information gathered from Bac Yen: that [unspecified] amounts of timber were being transported directly from Ta Xua commune to Phu Yen, missing out Bac Yen town entirely. The objective, therefore, of surveying Phu Yen was to attempt to quantify this volume of illegally harvested timber.

The survey team visited Van Ban to wait for the [non-forthcoming] permission and visited legal workshops. All the timber viewed (and data collected) represented legally auctioned timber which displayed the official FPD stamp and conformed with data gathered during research into legal trade and use (Section 1.2.1.1).

2.2 Methods

Surveys were conducted by FPD rangers from Lao Cai and Son La provinces. However, as many forest rangers lack the skills to carry out intelligence gathering investigations on the illegal timber trade, field surveys were preceded by a training workshop for FPD staff (see Annex 1) carried out by national and international experts in the timber trade. Training units were composed of:

- An introduction to the illegal trade in timber
- Illegal timber trade dynamics
- Regulation of the timber trade in Vietnam
- Investigation techniques
- Methodology development
- Information management

At the end of the workshop two FPD staff from each province journeyed to the sites of the survey to gather data. By assigning FPD staff to undertake survey work it was envisaged that the information gathered would be validated to national authorities.

The surveyors mainly gathered information on an *ad hoc* basis following leads and introductions where possible. A typical approach involved developing an undercover story (usually revolving around the supposed purchase of *F. hodginsii* timber) and asking a local person (motorbike taxi driver, shop owner etc) about *F. hodginsii*: cost, availability, sources, competence of local authorities, transportation, processing etc. This source may take the surveyor to timber dealers or workshops where further information could be gathered. The surveyors would visit as many timber workshops, and furniture shops, as possible. In this manner a broad picture of the timber trade network could be developed. Information was repeatedly gathered until informants provided no new information (i.e. information from new sources was repeated). Although it is inherently difficult to test accuracy of information on illegal activities accuracy was assumed to be greater where different informers provided the same information. The information gathered by the surveyors was recorded in log books (see Annex 1 for details) and subsequently used for report production.

Survey teams consisted of two FPD staff and the survey coordinator (and translator) within any one province. The number of man days research in each province totaled 15 though results were stifled to a greater or lesser extent due to permission issues.

2.3 Results

2.3.1 Son La province

Son La town

Very little information was gathered in Son La town and surveys were mainly conducted while waiting for permission to work in Bac Yen district. Many establishments suggested that it is now more difficult to acquire *F. hodginsii* products due to greater enforcement. The following results were gathered:

Supply:

- Three informants suggested that approx. 70% of all *F. hodginsii* timber entering Son La town is sourced from Muong La district

- All informants stated that all Muong La-sourced timber is received in Son La town as logs or pre-processed planks. This timber is subsequently processed into furniture, doors etc
- Timber confiscated by Son La FPD is auctioned in Son La town; auctions are usually held by the Son La Wood Processing Factory (which is owned by the Son La People's Committee) in Son La town (Son LA FPD pers. com.; two other sources also suggested that some small auctions are conducted covertly by Son La FPD for friends and relatives only
- According to two informants there are currently approx. 10 'large' sawmills (capacity not known) in Son La town each processing 2 – 3 m³/month *F. hodginsii* timber (though these are likely to be the official figures and are unlikely to necessarily reflect the real amounts).
- Confiscated wood in Son La town is currently bought from the government at auction. Two furniture shop informants allege that *F. hodginsii* wood was always available either through the legal auction or 'on order' (i.e. illegal purchase) from Muong La FPD.
 - Market price in Son La town for logs or pre-processed *F. hodginsii* timber is approx. 7.5 – 8 million VND/m³.
 - Auction price in Son La town for the same timber is currently 6.5 million VND/m³ (auction prices are set by the local provincial PC (in Son La town) or district PCs at their own discretion). Auctioned timber is usually sold in 'bulk' amounts so it is only the larger, wealthier sawmills or processing factories that have access to auctioned woods.
 - Wood (logs or pre-processed planks) bought directly from Muong La costs from 2 – 3 million VND/m³.

Trade links:

- Two shop informants allege that *F. hodginsii* timber (up to 10m³ at a local value of approx. 10 million VND per consignment) is transported from Muong La by truck along Road 37 and that illegal timber is often hidden under the truck's normal consignment. At the buyer's special request (and for an undisclosed sum) the Director of Muong La FPD will accompany the truck to assist transport through the checkpoint at Ngoc Chien, or false documents can be provided allowing the passage of *F. hodginsii* to Son La town. However, many sellers and/or buyers still attempt to bypass the FPD and large amounts are often confiscated by the district and provincial FPD
- Other routes are road 243 from Phu Yen and Bac Yen districts.

Demand:

- According to five shops surveyed, an 'average' sized furniture shop can expect to sell approximately 3 m³ of *F. hodginsii* furniture per month. Shops producing doors, frames and other construction products from *F. hodginsii* wood can expect to sell up to approx. 200 m² per month.
- Five shop owners stated that the majority of their buyers for *F. hodginsii* products (furniture or construction materials) are resident in Son La. Two sellers also said that some of the timber (an unspecified amount) is also transported to Hadong town in Ha Tay province (to supply the Hanoi market).

Bac Yen district

Surveys were initially hampered by the delay in getting permissions in Son La, and by the active attentions of the Bac Yen FPD. Indeed, the information provided by the major sawmills in Bac Yen town mirrored exactly the official information provided by district FPD during this survey. The implication of this suggests that either there is no illegal *F. hodginsii* activities currently being undertaken by these sawmills or that there is some form of communication between the sawmills and the local authorities. Nevertheless, some information was gathered by the survey team which seems to implicate these sawmills in illegal activities. Other than information regarding the use of legally auctioned *F. hodginsii* timber, no further information was forthcoming from these sawmills.

It is clear that while perhaps the exact volume and extent of illegal timber trade is not known senior district authorities are aware that it is occurring (Luong Van Nhung, Vice-chair Bac Yen PC *pers. com.*, Director Bac Yen FPD *pers. com.*)

Supply:

- According to both the dPC and all local informants *F. hodginsii* is harvested from the district by H'mong farmers from three communes (largest supplier is Ta Xua commune, site of the nature reserve); H'mong farmers from Ta Xua stated that most communal households have some *F. hodginsii* blocks (a 10cm x 20cm x 2m block = 0.04m³ sold at 120,000 VND) that can be sold in the market when money is required. These blocks are usually used by workshops in the production of furniture for Bac Yen residents.
- Four H'mong informants from Ta Xua said that within their commune there are three villages dealing in illegally harvested timber; of these Hang Dong 1 provides the majority of *F. hodginsii* timber at approx. 60 - 100 m³ per month (destination outside of Ta Xua but otherwise unknown) with another village, Pau 1 transporting approx. 7 m³ per month to Bac Yen town.
- Until 2004 permits were extended to Bac Yen PC for the legal harvesting of *F. hodginsii* deadwood (Bac Yen PC director *pers. com.*).
- Confiscated wood (Bac Yen FPD *pers. com.*): during the first 11 months of 2005, the district FPD seized eight consignments of illegally harvested *F. hodginsii*. Two cases (with a total volume of timber of approx. 1.5 m³ of planks) were being transported by a boat and hidden under maize; the other six cases were through H'mong farmers transporting a total of 2 m³ of wood from Ta Xua (farmers were not caught). See section 1.2.4 for further details of confiscations in Son La.
- Timber confiscated by the Bac Yen FPD is auctioned for the Bac Yen market. Auction prices are set by the Bac Yen People's Committee.
- Prices of timber (according to four informants) are as follows:
 - Auctioned timber: log 5 million VND/m³ / planks 6 million VND/m³
 - Local market prices for pre-processed planks and furniture are:
 - Plank of less than 2 m in length: 3 ½ million VND/m³
 - Plank of over 2 m in length with a 'good' surface: 6 million VND/m³
 - Plank of over 2 m in length and 50cm in width: 6 ½ million VND/m³
 - Extra large plank (80cm width): 7 million VND/set (for bed board)
 - Twin bed = 2 million VND/set
 - Chinese style sofa set = 6 million VND/set

Figure 4: H'mong villagers carrying blocks of *F. hodginsii* wood to sell at the local market



Photo: Do Thi Thu Ha

Trade links:

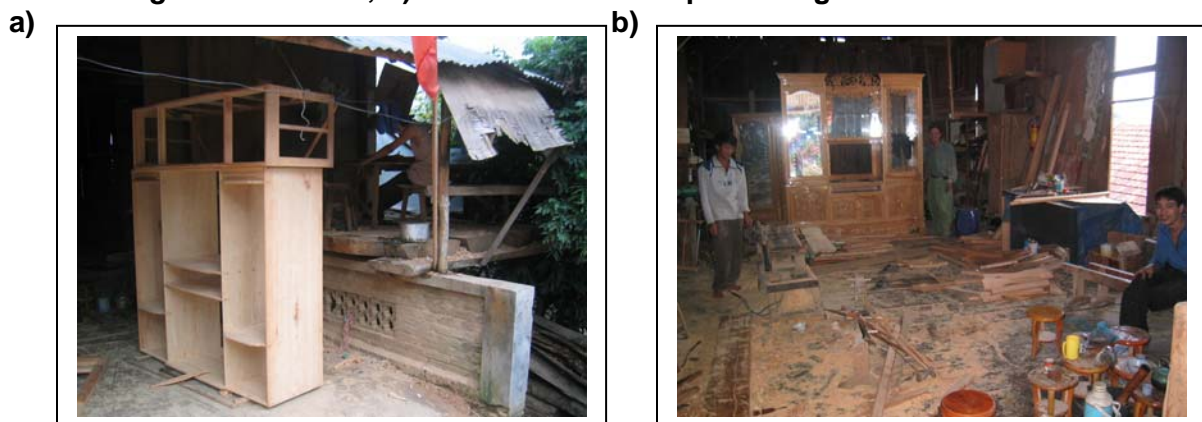
- According to four H'mong farmers from Ta Xua transportation of *F. hodginsii* timber occurs mainly through livestock and manpower. Where possible H'mong farmers carry the timber to avoid damage and maintain high timber quality. The majority of timber is carried to Road 243 where it is picked up by trucks, cars or buses and exported out of the district. Some timber is transported to Bac Yen town where it is sold to local sawmills and used for furniture making.
- According to two informants, timber is also floated down the river [Song] Da to Bac Yen town. However, this method of transportation has reduced in scale over the last five years due to confiscations. Currently approx. 10 m³/month is currently transported by river to Bac Yen town.
- Five informants suggested that the majority (exact amounts unknown) of illegally harvested timber is transported during the hours of darkness to avoid the authorities; other convenient times of local sale/transport are mealtimes.
- Two informants stated that most storage of *F. hodginsii* timber occurs at timber shops or timber shop owners homes due to worry over theft. Amounts at the time of survey thought to be stored in the surveyed area amounts to be approx. 40 - 50 m³.

Demand:

- Many informants (number not clear) claimed that the majority (see summary for estimate of volume) of timber illegally harvested in Bac Yen district is bought by timber dealers from Viet Tri town, Phu Tho province (for the Hanoi market).
- Two furniture workshops said that some timber (see summary for estimate of volume) is used in Bac Yen town and sold as furniture.

- Information provided by four H'mong farmers from Ta Xua suggest that a sizeable amount of timber is illegally harvested by local farmers and used for subsistence use (house building); an average of approx. 10 m³ *F. hodginsii* timber is used in the construction of one [H'mong] house.
- Three local informants alleged that in September 2005 the Vice-Director of Son La People's Committee purchased approximately 100 m³ of logs from a timber dealer in Bac Yen town and himself supervised the loading of timber into the trucks. Information from one of the informants suggests that the district FPD provided false papers for the timber facilitating its transportation to Son La town.
- Bac Yen has only five timber processing shops; one doesn't process *F. hodginsii* timber, another two are very small. The two largest are run by brothers and together process (for local furniture) approximately 12 m³/month in their shop including auctioned timber (although official confiscation data says that only approx. 4 m³ was confiscated from the whole of Bac Yen district in the first 11 months of 2005). While surveys conducted in the workshops produced data, this information was only for auctioned amounts. It was impossible to collect further data on illegal activities (workshop data mirrored official confiscation data). Further information on *F. hodginsii* timber volumes was provided by two to three secondary sources around each workshop.
- According to individual shop workers, three shops also purchase timber for transportation out of the province. One shop transports 20 m³ per month; another approx. 40 m³ per month; another approx. 50 m³ per month.
- According to many informants (number not provided) people caught with illegally sourced *Fokienia* allegedly pay bribes to law enforcement staff
- Total illegally sourced *Fokienia* is estimated (minimum) from this data at:
 - 80 - 100 m³/month on average for transport to Viet Tri (and/or other areas outside of Son La province)
 - 25 - 30 m³/month on average for processing (furniture making) in Bac Yen town
 - Variable amounts for special, one-off consignments (such as the 100 m³ for the Son La People's Committee Vice-Chair).

Figure 5: A Bac Yen workshop showing a) exterior with a semi-finished *F. hodginsii* wardrobe; b) inside the workshop showing a finished wardrobe



Photos: Thomas Osborn/FFI

Phu Yen district

Limited information was made available to the survey team due in part to the short duration of the team in Phu Yen.

Supply:

- Two workshop owners suggested that small volumes of timber derive from villages in Phu Yen district.
- Two informants suggested that most *F. hodginsii* timber (trees) can be found at Na village; other areas include Chem and Chu villages (Gia Phu commune). One informant said that another area where timber is harvested is Van Chan village, just across the provincial border in Yen Bai province.
- Two informants suggest that approx. 10 – 15 m³ *F. hodginsii* timber is sourced from Ta Xua commune, Bac Yen district.
- The largest workshop in the district employs 20 workers (according to the workshop owner).
- The wife of the (allegedly) largest dealer in illegal *F. hodginsii* timber works as the accountant for Phu Yen SFE (*pers. com.*).
- Three informants stated that all the major timber dealers buy auctioned *F. hodginsii* and the associated legal paperwork is used to 'hide' the illegal timber.
- Prices gathered from three workshops give 3 ½ – 4 million VND/m³ for *F. hodginsii* logs; high quality timber can sell for 6 million VND/m³. A sofa set (two single chairs and one double chair) would cost approx. 6 million VND



Figure 6: Inside a *F. hodginsii* timber workshop in Phu Yen district

Photo: Thomas Osborn/FFI

Trade links:

- Four informants claim that illegally harvested *F. hodginsii* is transported by road from Chem village, Gia Phu commune to Van Yen town; the timber is then often unloaded and transported further by river. Trucks usually carry approx. 2 m³ per journey.
- The same informants also state that timber is also harvested from Chu village and transported by truck (7 – 8 m³ per truck), and often accompanied by *F. hodginsii*-carrying motorbikes, to Van Yen town, and also unloaded and further

transported by river. The timber baron involved in this operation also arranges truck passage through the checkpoint.

- One informer with a shop near the bus station reported that buses leaving Phu Yen regularly carry up to 2 m³ *F. hodginsii* timber per journey.
- Two informants reported that *F. hodginsii* timber from Ta Xua commune (Bac Yen district) is usually transported by trucks (hidden under consignments of maize) to lowland regions e.g. Viet Tri.



Photos: Thomas Osborn/FFI



Figure 7: A variety of products made from *F. hodginsii* timber in Phu Yen district including a) a Buddha statue; b) chairs; and c) assorted Buddha figurines

Demand:

- Information from numerous sources (8 – 10) suggests the presence of five traders dealing in large volumes of illegal *F. hodginsii*; volumes of up to approx. 100 m³ per month were suggested by these informants.
- One shop owner reported that Phu Yen timber workshops deal with only Phu Yen sourced *F. hodginsii*.
- The same shop owner stated that only approx. 10% of *F. hodginsii* timber derived from Phu Yen stays within the district; the majority of the rest is exported to Son La town. A very small amount of Phu Yen *F. hodginsii* timber is transported to Viet Tri.
- Most of the timber transported to Son La is as finished products e.g. furniture and figurines (see Figure 7).
- One informant suggested that more than 45 m³ *F. hodginsii* timber is transported to Son La town every month.

2.3.2 Lao Cai province

Van Ban district

Some very small amount of information was gathered by chance indicating that there are some illegal activities occurring in Van Ban district. One source, who is a retired timber dealer living in Van Ban, provided the following information:

Supply:

- Auctioned timber in Van Ban sells for approx. 2 ½ million VND/m³. In Lao Cai this price can increase to 9 ½ – 10 million VND/m³.
- Timber is supplied generally by H'mong and/or Dao farmers who carry blocks of timber (10 cm x 20 cm x 2.2 m) along back paths (often between 4 – 5 pm) to avoid detection. Blocks are sold to shops when farmers require money, or according to demand
- Loggers harvest *F. hodginsii* all year around and hide the timber in the forest (e.g. under piles of leaves). Timber is brought to Van Ban according to demand.
- Access to *F. hodginsii* forests is very good; it is possible for trucks to collect the timber directly.

Trade links:

- Illegally harvested timber is regularly transported out of Van Ban on public buses. The volume usually carried is approx. 0.5 m³; such volumes are allowed through checkpoints and information suggests that some amounts of money are passed to the authorities to allow passage. Larger volumes are usually not allowed passage. There are about 11 – 12 buses per day giving a total daily export of 5.5 – 6 m³ per day (or 165 – 186 m³ per month).
- Timber is also transported by river. Approx. 2 – 3 m³ can be tied beneath bamboo rafts to float through the district. This timber is then loaded onto trucks and sold to Lao Cai and China.

Demand:

- Harvesting of *F. hodginsii* is a regular occurrence. However, transportation of the timber to Van Ban town is usually demand driven. Information suggests that any amount of timber is always available.
- One shop in Lao Cai selling *F. hodginsii* beds bought them (as finished products) from Phu Yen district, Son La province. These articles did not have legal papers associated with them.

2.4 Summary of the illegal trade survey

The following information is informant-based and is reflective of the general illegal trade situation. It is likely that some information may be inaccurate and incomplete:

Approximately 70% of all *F. hodginsii* timber in Son La town originates from Muong La District. Timber from Muong La and Bac Yen districts is transported along roads 37 and 243 respectively from these two districts in the form of logs or pre-processed timber. This timber is subsequently processed into furniture, ornaments or construction

materials. In contrast, *F. hodginsii* wood from Phu Yen district is generally already processed before transport (again along road 243) to Son La town. Reasons provided suggest that Muong La and Bac Yen do not have as skilled carpenters as either Phu Yen or Son La town. The different districts of supply are such that any amount of *F. hodginsii* wood is available 'on demand.'

Bac Yen district currently has fairly high levels of *F. hodginsii* timber exploitation though informant information suggests that the amount passing through Bac Yen town has decreased over the last few years. The largest commune supplier of *F. hodginsii* in the district is Ta Xua commune which also holds 4,272.2 ha of nature reserve. Within Ta Xua commune, Hang Dong 1 village harvests the most *F. hodginsii* for illegal sale (60 – 100 m³ per month). Most Ta Xua timber is transported by manpower to road 243 where it is bought by timber dealers and transported to Viet Tri town in Phu Tho province. Other, smaller amounts of timber are often carried to the road and transported to Bac Yen by vehicle (motorbike or truck) or by floating down the river where the timber is 'laundered' by local timber dealers (i.e. the illegally harvested timber is mixed with legal, auctioned timber). Blocks (0.04m³) of *F. hodginsii* are also sold in the market (for 120,000 VND) by H'mong farmers from Hang Chu and Xim Vang commune when money is required. Local timber workshops are small appear to have limited capacity. Approximately 100 - 130 m³ /month on average of *F. hodginsii* timber is estimated to be illegally harvested from Bac Yen district with approx. 80% exported out of the district.

Phu Yen district holds one major SFE that is licensed to harvest *F. hodginsii*. However, the district also has high levels of illegal harvesting of the timber with an estimated 100 m³ *F. hodginsii* timber being processed by local dealers. Of this the majority originates from Phu Yen with only about 10 – 15 m³ from Bac Yen (Ta Xua commune). Approximately 10% of Phu Yen-derived timber remains in Phu Yen town with most of the remainder processed and exported to Son La town (a small amount is also transported to Viet Tri town). It is conservatively estimated that 50 – 60 m³/month of processed *F. hodginsii* is exported to Son La town.

Information from Van Ban district in Lao Cai province is limited. While informants agree that the amount of illegally harvested *F. hodginsii* passing through Van Ban town has overtly decreased over the last five years it is clearly still occurring. Access to *F. hodginsii*-containing forest is good and informant information suggests that loggers in the communes harvest *F. hodginsii* all the year but transport to Van Ban town according to demand; and that any volume required can be purchased. H'mong and Dao farmers from the communes carry blocks of *F. hodginsii* wood by 'back' ways to the town when money is required.

Prices for auctioned *F. hodginsii* timber vary between communes, district towns and provincial towns (see Table 13). In Lao Cai province auctioned timber (logs or pre-processed) in Van Ban sells for approx. 2 ½ million VND/m³ while in Lao Cai city this price can increase to 9 ½ million VND/m³. In Son La province auctioned timber (logs or pre-processed) sell for 5 – 6 million VND/m³ (Bac Yen) or 6 ½ million VND/m³ in Son La town.

Market prices for *F. hodginsii* timber are generally slightly higher, especially in the large town or cities (see Table 13). In Phu Yen prices are generally 3 ½ – 4 million VND/m³ for logs; high quality timber can sell for 6 million VND/m³. In Bac Yen prices vary from 3 ½ – 7 million VND/m³. Market prices in Son La for logs or pre-processed timber are approx. 7

½ - 8 million VND/m³ while wood bought directly from Muong La costs only 2 – 3 million VND/m³.

Table 13: Costs of *F. hodginsii* timber purchased from local auctions and local markets

Timber purchase type	Location					
	Son La town	Muong La	Bac Yen	Phu Yen	Lao Cai	Van Ban
Auctioned timber (million VND/m³)	6.5	N/A	5 - 6	N/A	9.5	2.5
Market (million VND/m³)	7.5 - 8	2 - 3	3.5 - 7	3.5 – 4 (-6)	N/A	N/A

Source: survey informants

Notes: Auctioned timber constitutes legal timber (see section 1); market timber is illegally sourced timber.

Subsistence use of *Fokienia hodginsii*

Le Quang Trung, Le Trong Hai, Nguyen Manh Hiep
Centre for Natural Resources and Environmental Studies

Research into subsistence use was designed to complement the research into both legal and illegal harvest and trade surveys. To this end the subsistence surveyors worked in two communes with high levels of extant standing *F. hodginsii* forest within the target districts: Nam Xay commune in Van Ban district (Lao Cai province) and Ngoc Chien commune in Muong La district (Son La province).

3.1 Survey methodology

As is clear from section 2, research into activities regarding use and trade of *F. hodginsii* timber is sensitive (and potentially threatening) and the situation is the same at the local (communal) level as district and provincial levels. The survey was, therefore, conducted under the guise of a general socio-economic survey rather than purely as a survey focussed on *F. hodginsii* use and trade.

The methodologies, techniques and tools applied during this survey include:

1. Collection and analysis of secondary data from local (commune and district) authorities relating to:
 - the socio-economic condition of the surveyed sites; including location and topography, land statistics and use, population demographics, education and healthcare and household economic activities (presented in Annex 6);
 - background information on *F. hodginsii* harvesting and utilisation including areas of harvest, scale of harvest, timber transportation methods and construction practices;
2. Direct observation (including photography where possible);
3. In-depth interviews with key informants such as communal staff, village heads, forest rangers, leaders of mass organizations, farmers, loggers, hunters and teachers, according to availability;
4. Household interviews in Nam Xay (Tu Thuong, Ta Nang (including Nam Xi Tan hamlet) and Tu Ha villages) and Ngoc Chien (Muong Chien, Khau Vai and Ban Luot villages) communes based on semi-structured questionnaires. Questions were based on, but not exclusive to:
 - Ecological aspects; including size of trees harvested, distance to harvest sites and tree types;
 - Subsistence use; including households use and amounts used for construction;
 - Livelihoods; including land use and cultural practices;
 - Trade; including prices for timber and local trade dynamics.

Information and analysis were conducted by three researchers (see above). Research was conducted for approximately a half to one day in district and/or communal centres, and one day in each village (or three man days research per village). Interviews were

conducted initially with the village head (or vice-head) followed by several key informants and then with individual households. While every effort was made to interview thoroughly as many key informants as possible, results were restricted by availability. Similarly, approx. 30 households from each village were interviewed. Households were selected to proportionally reflect different ethnicities and socio-economic status within villages where available.

3.2 Survey results

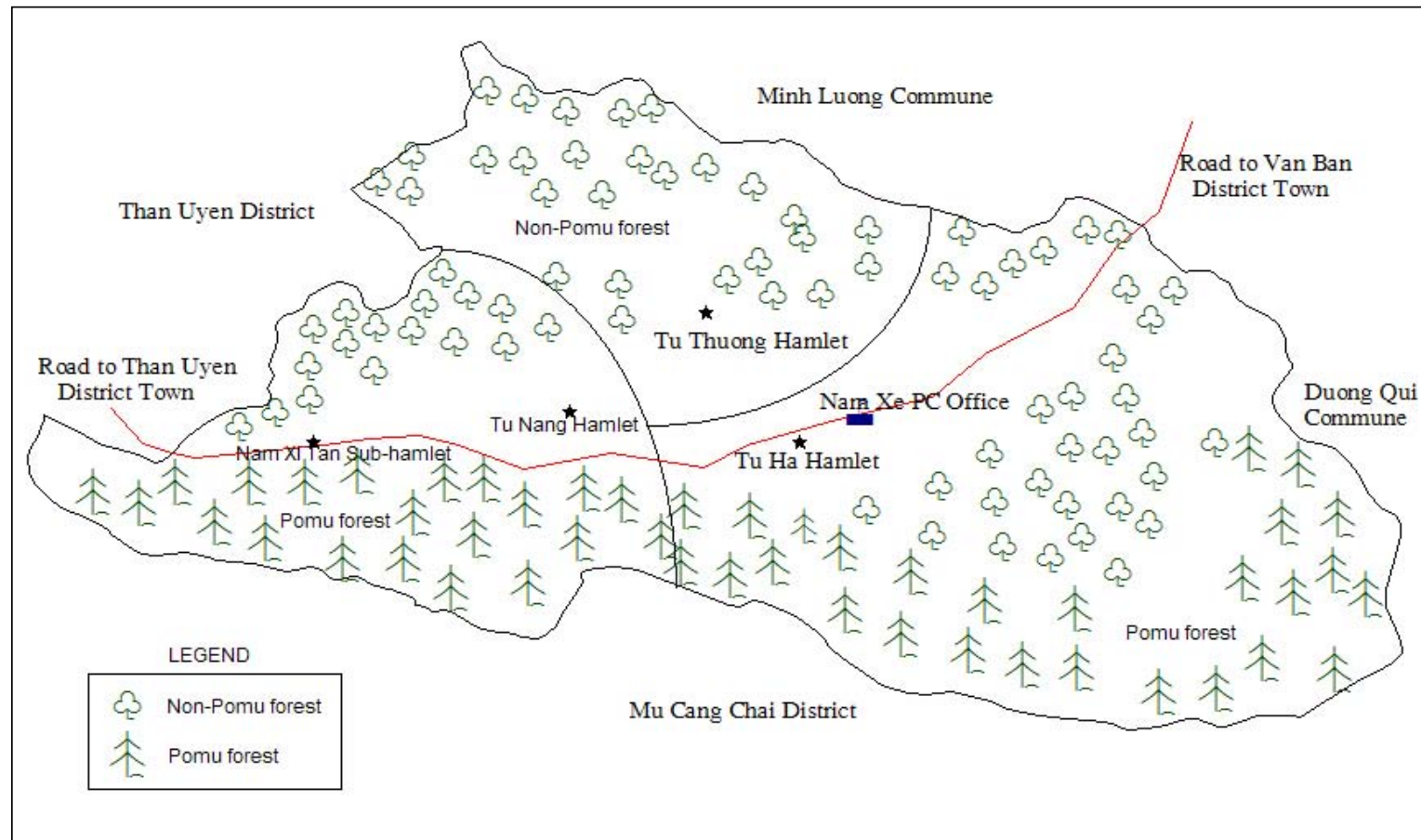
The following results are a synthesis of information provided by all informants. Information is presented based on majority consensus though, where appropriate, individual accounts are also provided. This report is, therefore, presented as an overview of subsistence use in the survey areas.

3.2.1 Exploitation, use and trade of *F. hodginsii*

Approximate ranges of *F. hodginsii*-containing forest in the two communes is presented in Maps 4a and b. The maps in the figure are not to scale and are provided as an indication of areas of current *F. hodginsii*-containing forest in the two communes only. Map details were gathered from a combination of local authorities' records (no reference available), interviews with key informants and households in surveyed local villages and personal observation.

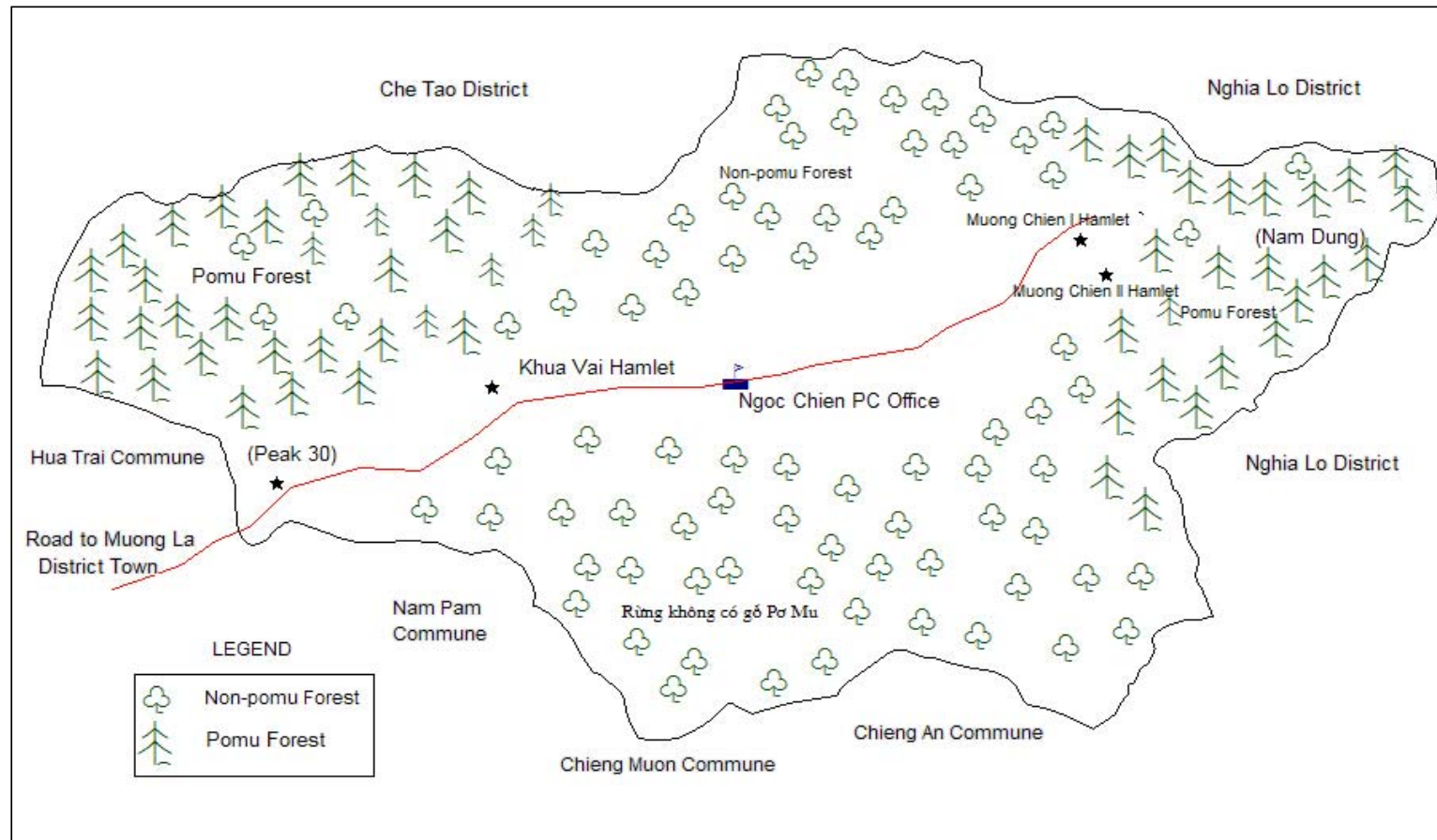
Further map details are provided in Maps 2 and 3.

Map 4a: Sketchmap for *F. hodginsii* (Pomu) distribution in Nam Xay Commune (not to scale)



Note: 'Nam Xe PC Office' should read 'Nam Xay PC Office'; for '*F. hodginsii*' read 'Pomu'

Map 4b: Sketchmap for *F. hodginsii* (Pomu) distribution in Ngoc Chien Commune (not to scale)



3.2.1.1 Exploitation

Tree size and types

According to all local people interviewed in Ta Nang village of Nam Xay commune, loggers that harvest *F. hodginsii* timber for house construction normally fell trees with a diameter of 80 to 100 cm. However, trees with a diameter of 50 cm in easily accessed areas that are convenient for cutting are also felled for splitting into flat boards. Before 1997, people in Ngoc Chien commune only harvested *F. hodginsii* trees which were over 100 cm in diameter (the high quality timber then used for export while the lower quality timber was kept for house construction), but in recent years, due to a decrease in available timber stock, trees with a diameter of less than 50 cm are also being felled. Evidence from personal observation suggests that loggers in Muong Chien village are currently selling logs with a diameter of less than 40 cm (ϕ 40 x 100cm).

Trees with a trunk diameter of over 100 cm can often provide a minimum 8 m³ of timber. However, *F. hodginsii* trees often grow on rock cliffs on high mountain peaks (trees in these areas are subject to high winds so often trees are more stunted) and have very short trunks. Such exposed trees, of over 100 cm in diameter, provide only approximately 2 m³ of timber.

Local people in both survey communes state that there are three types of *F. hodginsii* wood: white, yellow and black wood (see Table 14). As the timber characteristics of these three types are different loggers, must carefully consider which tree to cut before felling.

Table 14 Advantages and disadvantages of the three types of *F. hodginsii* wood

Type of <i>F. hodginsii</i>	Advantages	Disadvantages
White	Light weight and easy to cut	Most susceptible to pests such as woodworm; less resistant to harsh weather conditions
Black	Beautiful finish	Very heavy
Yellow	Bright colour; fine grain; not susceptible to woodworm; not very heavy	None stated

Source: Inhabitants of Nam Xay and Ngoc Chien communes

White *F. hodginsii* is the most brittle and susceptible to woodworm and harsh weather conditions (perhaps due to low oil content) and is seen as the least desirable colour; it is the cheapest of the three types. Black *F. hodginsii* wood takes a beautiful red colour after processing but is the heaviest type; this timber is now rarely harvested as transportation (manpower) in complicated terrains can be very difficult. Yellow *F. hodginsii* is the timber most often harvested by local people because it's bright colour, fine grain and non-susceptibility to woodworm, in addition to its advantage of not being too heavy for transportation; it is the most expensive of the three types. Unfortunately there is no data regarding abundance or distribution of the three types; nor any firm taxonomic differences noted. Loggers differentiate between them by carving the trunk of the tree in question.

This report deals with aspects of this yellow *F. hodginsii* as the other two types are rarely used, and only when the yellow type is unavailable.

Extraction times

According to interviews with local people, trees are cut during the dry season. The months of harvest are usually from October to May when the weather is driest and most convenient for both harvesting and transportation. *F. hodginsii* timber is also be cut at any time of the month in contrast to many other timber species (e.g. *Michelia medriocris*, *Manglietia dandyi*, *Cinnamomum tonkinensis*, *Morus alba*, and *Fagraea fragrans*) which local people cut and pre-process (sawing) around the 20th of the lunar calendar month; local people believe that harvesting before this date leaves the timber open to attack by woodworm and other pests.

Distance to extraction sites

According to interviews with local households, distances to forest that contains *F. hodginsii* are increasing with time. As can be seen from the maps in Maps 4a and b the forest in closest proximity to the commune centres consists of forest without *F. hodginsii*. This is most clearly seen in Map 4b of Ngoc Chien commune. Verbal information gathered during this survey suggests that the distances from the commune centres, and also outlying villages, to *F. hodginsii*-containing forest is increasing due to high harvesting pressure. Areas of extraction are defined by ease of extraction i.e. both distance to suitable trees and topography. In Nam Xay commune, while the distance from the house to the harvest site depends on the house location, the house closest to the harvest site is approx. two hours walk to *F. hodginsii*-containing forest (in Nam Xi Tan hamlet) and a further six hours to the area of extraction (where the larger trees are found). Tu Thuong village no longer contains harvestable *F. hodginsii* trees.

According to households in all surveyed villages in Ngoc Chien commune, the easiest exploitable timber is currently found in two areas: Peak 30 (Khau Vai village) and Nam Nghêc (also known as Nam Dung) (Muong Chien village). Two years ago, local farmers from Khau Vai village harvesting from Peak 30 needed only 1-2 hours of walking to reach harvest sites; now they need greater preparation as the walk is approx. 3-4 hours to reach sites of timber exploitation. Loggers in Muong Chien who want to harvest *F. hodginsii* need go further than the people in Khau Vai (exploitation here is conducted not only by loggers of Ngoc Chien but also of Nghia Lo (Yen Bai province)); the nearest location for exploitation is approx. 3-4 hours away but only for small amounts of timber (and small trees). For larger trees and larger amounts loggers must walk for the whole day.

Extraction processes

Most *F. hodginsii* harvesters are local men of 16 to 45 years of age, or are from other regions arriving to work on the harvest.

Different ethnic groups have different timber harvesting practices (according to household interviews in each commune):

Ngoc Chien:

- For Thai practices only the men log, process and transport timber;
- The H'mong have a clearer division of labour: the men cut and saw the timber, the woman assist in timber transportation and food provision, and the children harvest the *F. hodginsii* roots for the production of wood tapers (for lighting fires).

Nam Xay:

- There are only two villages involved in the harvesting of *F. hodginsii* timber, Tu Hạ and Ta Nang, due to their proximity to the suitable *F. hodginsii* forests. Both villages consist of H'mong and Dao people. In both of these villages it is mostly the men who harvest, process and transport the timber.

Trees are felled and often pre-processed (i.e. sawn into blocks, planks etc) on-site at the area of felling for ease of extraction. Information from interviews suggests a number of different tools are used in timber processing:

- Hand held axe: used to cut trees down. The major disadvantage of this method is the substantial waste of timber when cutting down a large diameter tree. For example trees of >1m diameter must be felled at a height of approx. one metre above the ground and a loss of over 0.75 m³ of prime timber. Hammers and axes are now rarely used in felling trees.
- Ripsaw: used to saw logs into blocks and planks for different timber uses. Usage requires two people pushing and pulling synchronously to saw the timber. This type of saw is most often used to fell trees as it involves less wastage of timber and operation generates less noise than other methods.
- Handsaw: used to split timber into pieces. The advantages of the handsaw are its light weight, and ease for conveyance and manipulation. Its disadvantage lies in its limited usability (only used to split small logs and cannot be used for sawing trees).
- Motor saw: mainly used to split timber, cut trees down, and trim the branches. Major disadvantages of the motor saw include the fuel requirement (petrol), maintenance and high monetary investment. Only the SFEs and forest rangers are authorized for the use of a motor saw in timber harvesting and forest fire prevention purposes.

Transportation of timber

Due to high and mountainous topography in most of the surveyed areas the common transportation means is still through manpower. If the volume of timber to be transported is small and light one person is needed (e.g. carrying short logs, wall boards, small girders or square lumber), but with large and heavy timber two to six persons are required (e.g. carrying large bed boards, tall poles). In Nam Xay people also often use buffalo for conveying timber in relatively flat areas (but not in Ngoc Chien due to a lack of flat areas). Winches are only used in areas with very steep slopes when manpower is insufficient.

Harvesters

Other than farmers and loggers of local villages there are also people in neighboring communes that participate in the harvesting and transportation of *F. hodginsii*. For example, residents of Nam Xi Tan village said many people from Mu Thang commune, Than Uyen district, Lai Chau province come to harvest *F. hodginsii* in forest areas belonging to Nam Xay commune; in forest areas of Ngoc Chien commune loggers from Nghia Lo town, Yen Bai province also come to harvest. Additionally, according to farmers from Khau Vai village, some “timber barons”, or large-scale timber dealers (number unknown), hire people from lowland regions such as Ha Tay and Vinh Phuc provinces to log *F. hodginsii* trees from Peak 30 of Ngoc Chien commune. It is likely that many loggers from Nghia Lo and such areas are harvesting for trade purposes rather than subsistence use *per se*.

In a previous survey in Na Nheo village of Van Ban district (Tran Chi Trung and Mai Van Thanh, 2004) it was stated that the H'mong people would sell a certain quantity of *F. hodginsii* timber at a very low income (around 200,000 – 300,000 VND/m³). This survey, however, found that the mechanism usually employed sees farmers advanced cash by the traders with subsequent harvesting and delivery¹⁵. In Ngoc Chien commune traders are alleged to pay 50% costs in advance with the remainder paid upon delivery. Timber harvest in Ngoc Chien is one of the most (if not the most) important activities for generating household income.

As well as the above loggers, logging is still undertaken legally by Van Ban and Muong Bu SFEs which have quotas for *F. hodginsii* and other low grade timbers (see section 1.2.3 for legal harvesting quotas by these SFEs) (*pers. com.* local informants). Local people from Khau Vai village, Ngoc Chien commune said that Muong Bu SFE still harvests all the year round both low quality timbers and *F. hodginsii* timber. Low quality timber logs of greater than 20 cm diameter, cut by motor saw and hand saw, are often seen. For *F. hodginsii*, timber is cut into pieces of 220 cm x 12 cm x 12 cm. Local people are then hired to carry timber out of the forest, with strong labourers able to earn 40,000 VND per day, and weaker labourers 25,000 – 30,000 VND through carrying timber. Van Ban SFE harvests most of its timber from Duong Qui and Nam Xe communes. Harvesting from Nam Xay commune also occurs but on a much reduced scale (about 7 m³ per year). Information suggests that the SFEs are only allowed to harvest trees that have reached peak maturity, when the diameter of the trunk is about 120 cm (after peak maturity trees of *F. hodginsii* often become hollow and die) (Van Ban FPD *pers. com.*). It is not known how old trees are (on average) when this diameter is reached.

3.2.1.2 Use

According to the surveys in Nam Xay and Ngoc Chien communes, local people in these areas harvested *F. hodginsii* mainly for house construction, fine art handicraft products (such as furniture) and coffin construction. Of these uses house construction forms the largest use group. This is particularly true in Ngoc Chien commune where most local people are ethnic Thai who typically construct large stilt houses almost entirely of *F. hodginsii* timber. Amounts of *F. hodginsii* timber required to build a traditional Thai house in Muong Chien 1 village, Ngoc Chien commune is provided in Box 4. According to a Thai house builder in Muong Chien 1 village, since 1997, 6-7 new *F. hodginsii* houses are constructed annually. Assuming that the average timber volume of a house approximates to 24.6 m³ then 147.6 – 172.2 m³ of *F. hodginsii* is harvested for new house construction annually for Muong Chien 1 village only.

Data on the length of time required for house construction cannot easily be estimated. Each situation is different and time is usually dependent on the number of people involved in harvesting and extraction, as well as house building itself. However, it is likely that these factors in turn are influenced by the wealth and/or standing of the house builder: the wealthier the builder the more people can be employed to assist with harvesting, extraction and building and the faster the house will be built (authors' own data).

Data on total communal use of *F. hodginsii* for construction is not available and is dependent on a number of factors including the size and location of the house, the

¹⁵ According to household surveys, in cases where the harvester becomes sick or otherwise unable to harvest the timber the harvester (and family) become indebted to the timber trader.

number of individuals residing in the house, customs of the different ethnicities, and socio-economic and political situations at any given time. Nevertheless, a crude calculation of the current situation in Ngoc Chien can be estimated. As can be seen from Box 4 over 24 m³ of *F. hodginsii* timber is required to construct one 'average' Thai house. Ngoc Chien commune currently has 1,331 households; according to the Ngoc Chien PC (*pers. com*), over 90% of households in the commune build their houses from *F. hodginsii*. If it is assumed that all those households building from *F. hodginsii* timber utilize the same amount of timber as the example given in Box 4 then approx. 29,500 m³ *F. hodginsii* timber has been harvested for construction purposes in the commune (data is for houses currently standing in the commune). There is no data on longevity of houses built from *F. hodginsii*; however, roof tiles made from the wood need to be replaced after approx. 30 years.

Box 4 Amount of *F. hodginsii* timber used to build a 'typical' Thai house in Muong Chien 1 village, Ngoc Chien commune

A typical Thai house may have a floor area of approx. 144 m² and five compartments (or rooms). Amount of timber needed would be:

Component	Number required	Total volume required (m ³)
Tall poles	10	2.16
Short poles	26	3.74
Girders	100	6.00
Beams	12	1.01
Wall boards	-	2.55
Floor boards	-	3.61
Roof tiles	-	5.50
Total		24.60

Source: Mr Lo Van Xuan, housebuilder in Muong Chien 1 village

However, for H'mong and Dao people in Nam Xay commune the volume of *F. hodginsii* timber used for house construction is much less. Floors are generally mud based (houses are built on the ground rather than on stilts as with the Thai), bamboo is more often used and roofing materials are now often fibre cement-based. Other timbers are usually used in H'mong house construction such as *Morus alba*, *Michelia mediocris*, *Cinnamomum tonkinensis* and *Vatica odorata*. In this area one house requires only 8-12 m³ of ready-made *F. hodginsii* timber materials on average for poles, girders, beams and wallboards¹⁶. Very few H'mong houses in Nam Xi Tan village only are built purely from *F. hodginsii* timber and even here the roofs are not constructed from *F. hodginsii* tiles.

Furniture constructed of *F. hodginsii* is also used at the subsistence level. However, with *F. hodginsii* trees becoming increasingly remote many families are turning to purchasing

¹⁶ One H'mong informant from Nam Xay, Mr. Ly A Chung, said his house was built in 2003 using two *F. hodginsii* trees, each of over 100 cm in diameter and more than 10 m in length. The house consisted of 11 m³ of *F. hodginsii* timber in total. To obtain this amount of timber for building a house it would need eight persons (four pairs of saw workers) working continuously for approximately one week to cut the timber; it would then take a further two days to transport the timber from the saw site to the construction site.

pre-made furniture rather than undertaking the laborious timber extraction and carving themselves. This is particularly true in Nam Xay commune where the high income earned through the farming of Cardamom (*Amomum aromaticum*) allows purchase of high value *F. hodginsii* products¹⁷. In Ngoc Chien commune some households will reserve timber and hire experienced craftsmen from other regions who are used to making furniture from this timber. Some households also use the wood to make looms. Residents from Ngoc Chien commune also use *F. hodginsii* timber for household utensils more than those from Nam Xay commune.

Figure 8: H'mong couple from Tu Thuong village, Nam Xay commune, with *F. hodginsii* furniture in their house



Photo: Le Quang Trung/FFI

Coffins made from *F. hodginsii* timber are widely used due to the wood's non-susceptibility to woodworm. Information on average coffin size (amount of wood required) and cost was not available.

Some H'mong and Dao people also used to extract *F. hodginsii* essential oil from the roots and use this oil for medicine and for selling though the practice is now not common. Some Dao traditional doctors/herbalists are said to also use *F. hodginsii*

¹⁷ One interviewed family from Tu Thuong village had recently returned from Minh Luong commune where they bought a sofa suite made from *F. hodginsii*. When questioned as to why the items were purchased rather than made by the family they answered that buying the final product is quick and more efficient than making it themselves. Further, because the *Amomum aromaticum* season this year brought him enough money, he is even able to buy furniture and other items, such as a motorbike. In addition, he faces no fears of the furniture being confiscated or himself being fined for logging as the furniture was bought 'legally', i.e. from auctioned timber.

leaves as a medicine for some trauma and bad cold treatments. Neither of these applications was observed.

F. hodginsii timber or other *F. hodginsii* parts are rarely used for firewood as the trees are found too far from the village and transportation is difficult. Other, poorer timbers can be found closer to villages and are used preferentially.

3.2.1.3 Trade

Other than exploitation for house construction, the people in Ngoc Chien commune, in particular Khau Vai, Ban Luot and Muong Chien villages, also harvest the timber for sale as their main income (as opposed to when it's needed – see below). Harvesting for sale is very popular in Ngoc Chien as it is very easy to sell timber across the provincial border to Yen Bai province (indeed most (unspecified amount) timber is transported to Yen Bai). Most men resident in these villages are involved in timber cutting and transportation, and especially *F. hodginsii* timber because it commands the highest price amongst those local timber tree species that are procured by many timber traders. Households that do not participate in timber logging are often considered poor.

In Nam Xay commune particularly, local people also harvest *F. hodginsii* timber for sale when needed (i.e. when cash is needed timber is brought to the market and sold). Timber is also sold in small amounts to bus or truck drivers (*pers. obs.*). Recently, however, with the expansion of Cardamom (*Amomum aromaticum*) as a high value cash crop (and due to less legal restrictions on Cardamom production), many families have ceased the harvesting of timber for cash.

Figure 9: A logger carries a plank of *F. hodginsii* through Ban Luot village, Ngoc Chien commune



Photo: Le Quang Trung/FFI

Tables 15a and b below provides timber prices for Ngoc Chien and Nam Xay communes respectively.

Table 15a: Price of *F. hodginsii* timber sorted into size and use categories in Ngoc Chien commune

Timber category	Size L-W-H (cm)	Use	Selling price in village (VND)	Selling price in commune (VND)	Price in district (VND)	Notes
"Sofa bed"	250x80x10	For sofa bed (handcrafted sofa bed) manufacture	1 million	1.2 million	2 million	Not common
Flat board	220x80x3-5		200,000			Not common
"Lumber"	100x20x20	Multi purpose	80-100,000			Common
"Lumber"	250x40x5	Multi purpose	100,000	N/A	300,000	Most common size
"Lumber"	270x10x25	Mainly for door	90,000	N/A	300 – 350,000	
Main pole	600x20x18	For main pole of tilt house	300,000	N/A	N/A	Mainly used for house construction in the locality
Supporting pole	400x20x18	For supporting pole of tilt house	200,000	N/A	N/A	Mainly used for house construction in the locality
Girder	650x10x13	For house girder	N/A	N/A	N/A	Not for sale
Beam	400x10x15	Beam	N/A	N/A	N/A	Not for sale
Wall board	220-250x40-50x2	Surrounding wall of house	40-60,000	60,000	60-100,000	Rarely sold to people in district
Floor board	500-600x30-40x2.5	Tilt house flooring	N/A	N/A	N/A	Dependent on size of house
Roof board	100x40x2	Roofing	N/A	N/A	N/A	Not used much now; usually substituted with fiber cement roofing panel
Log	φ 40cm	Multi purpose	100,000	N/A	N/A	Not common

Source: Local informants

Table 15b: Price of *F. hodginsii* timber size and use categories in Nam Xay commune

Timber category	Size L-W-H (cm)	Use	Selling price in village (VND)	Selling price in junction of group 9 of Nam Xuan	Selling price in Than Uyen district	Notes
"Lumber"	250x10x15	Multi purpose	100,000	160,000	200,000	Common
"Lumber"	150x10x20	Multi purpose	100,000	140,000	200,000	Common
"Lumber"	150x30x10	Multi purpose	150,000	200,000	300,000	Common
Panel	220-250x40-50x3	For door panel	N/A	N/A	N/A	Common

Source: Local informants

Local *Fokienia hodginsii* trade mechanism

Simplified trade and use diagrams for Nam Xay and Ngoc Chien communes are provided in Boxes 5a and b.

Trade of *F. hodginsii* in Nam Xay commune is mainly with Than Uyen town. In Nam Xay commune, people generally sell timber to bus drivers or truck drivers; these buyers only buy quality timber that has no cracks or artificial joints. This timber is then conveyed to Van Ban town or to Than Uyen. According to the people of Nam Xay the major harvesting (i.e. large amounts) in Nam Xay commune is conducted by people from Than Uyen and subsequently sold to a major timber dealer in Than Uyen district or, more normally, sold through a number of trading dealers with each dealer earning approx. 25 – 40,000 VND/0.01m³. To convey timber to Than Uyen town dealers hire motorbike taxi transportation from 1 to 2 o'clock pm (when the authorities are eating and sleeping). The majority of timber is piled at the junction of group 9 of Nam Xuan commune of Than Uyen district where there is a road connecting Than Uyen town to Van Ban and Sa Pa.

In Ngoc Chien commune, local people have observed that *F. hodginsii* timber harvesting for commercial sale has expanded in recent years with the construction of an asphalt road to Peak 30 (serving the building of the dam for Ngoc Chien hydro power plant). There are two key areas of *F. hodginsii* logging in Ngoc Chien commune: Peak 30 belonging to Khau Vai village, and Nam Nghec village (or Nam Dung village) close to Muong Chien village, which neighbors Nghia Lo district of Yen Bai province. At present, *F. hodginsii* is of limited availability in the Nam Nghec area due to exploitation by both Nghia Lo and Ngoc Chien people. Nghia Lo loggers are often seen in the forests by Muong Chien people. It takes Nghia Lo people two days to reach the logging sites, while Muong Chien people need only four hours to get there. Due to the fact that forests in Nam Nghec have already been overexploited, all Ngoc Chien loggers now visit Peak 30 to harvest *F. hodginsii*. Although *F. hodginsii* in this area is still abundant, loggers must still leave their houses in early morning to reach the site by noon.

Besides taking the wood for household consumption, loggers also sell the wood to buyers from Nghia Lo district (the timber is procured in Muong Chien village). Although Muong Chien village is the most remote in the commune motor vehicles from Nghia Lo still have good access via the newly asphalted road. Alternatively, deals are conducted

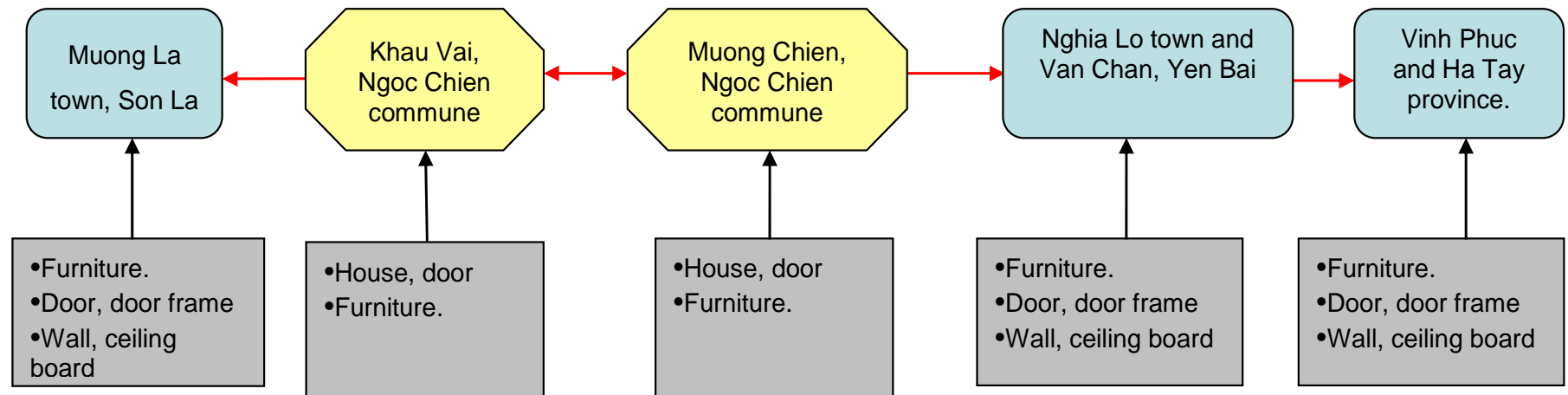
in Muong La town. Timber traders from Muong La town often travel to Khau Vai village (about 3 km from Peak 30) to procure timber which is then transported to Muong La for resale. Traders' profits are often very high compared to the purchasing price in Khau Vai. For example, a piece of lumber measuring 270x10x25 cm costs only 90,000 VND in Khau Vai village but can be sold for 300 - 350,000 VND in Muong La town (see Table 15a).

Figure 10: Local use and trade has helped denude hills in Nam Xi Tan hamlet, Nam Xay commune of much of the *F. hodginsii*-containing forest



Photo: Le Quang Trung/FFI

Box 5a: Diagram of trade and use of *F. hodginsii* harvested in Ngoc Chien commune, Muong La district



Notes:

Yellow boxes - sites of active research;

Blue boxes – areas where the timber is traded and/or used according to the results from this research;

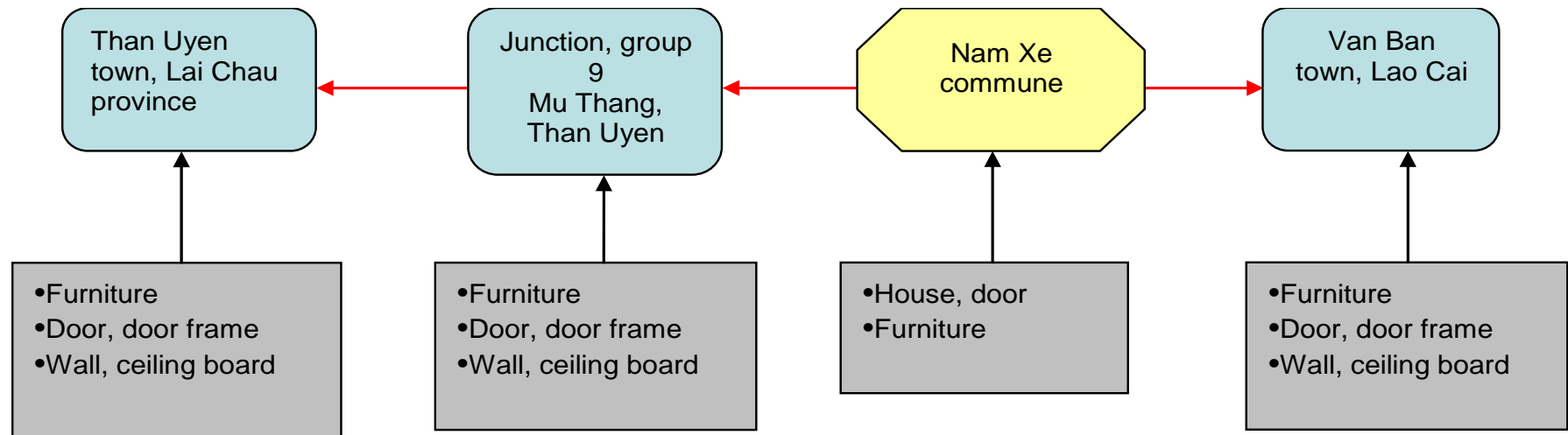
Purple boxes – *F. hodginsii* use groups in these areas;

Red arrows – movement of wood and/or products between areas;

Black arrows – indicate timber use in respective areas.

The above diagram is a general scheme based on the results produced during this survey and should not be taken as absolute.

Box 5b: Diagram of trade and use of *F. hodginsii* harvested in Nam Xay commune of Van Ban district



Notes:

Yellow boxes - sites of active research;

Blue boxes – areas where the timber is traded and/or used according to the results from this research;

Purple boxes – *F. hodginsii* use groups in these areas;

Red arrows – movement of wood and/or products between areas;

Black arrows – indicate timber use in respective areas.

The above diagram is a general scheme based on the results produced during this survey and should not be taken as absolute.
For Nam Xe commune read Nam Xay

3.2.2 Institutional issues

Land and forest allocation

Nam Xay commune: land and forest allocation has been implemented but land-tenure is still unclear in many cases, especially those where families divide (through marriage) and have not yet been extended land use books. Many families also cannot afford to pay for official land measurement which is necessary for land book allocation.

Ngoc Chien commune: land and forest allocation has not yet been implemented. Reasons provided by local people in this survey are similar to those for Nam Xay commune with the added issues surrounding the resettlement programme for households currently resident in the flooding area for the hydropower plant reservoir.

State Forest Enterprises

In 1992, Decree 18 (see section 1.2.1) came into force. This Decree contained management regulations for the protection of listed endangered flora and fauna species. However, during 1990-1996, Van Ban SFE had an undocumented agreement from the Lao Cai PC that allowed physically capable persons to exploit and sell timber (local informants' *pers. com.*). This unofficial logging permission greatly affected not just *F. hodginsii* but also many other high-value timbers such as *Michelia mediocris*, *Cinnamomum tonkinensis*, and *Vatica odorata*. Since 1996 – 7, with the introduction of Decrees forcing forest closure, and increased controls on the use and trade of *F. hodginsii* and other species, levels of exploitation have decreased. At present the SFE harvests according to its quota and hires labourers for “selective collection” of timber (e.g. collecting of dry branches and dead trees).

In Muong La district, Muong Bu SFE and other local authorities have allowed (unofficially i.e. by verbal agreement) local people and SFE workers to “tan thu” (take everything) all timber from areas that will be inundated by the new reservoir of the Tà Bu hydropower plant. However, according to local commune authorities (*pers. com.*), it is unclear if current timber extraction is occurring solely from permitted areas or not.

Forest rangers

Forest rangers are subjected to many difficulties and constraints with regard forest protection including harsh topographical conditions, large areas of forest for patrolling and an inadequate protection force (both with regards numbers, attitudes – lack of incentives - and equipment). Additionally, illegal loggers who do not reside in the local area are reckless and are often very aggressive. Upgraded roads also facilitate the transport of illegally harvested timber. Indeed, evidence of confiscations was limited with only small amounts of confiscated timber observed at both Van Ban and Muong La forest protection stations.

Local authorities

Although forest protection roles have been introduced to local authorities by decrees and decisions at all levels, their implementation has remained a problem. One of the clearest examples is evidence that village and communal authorities still log timber from the forest (according to communal authorities) (richer persons build bigger houses and the poorer build smaller ones) and therefore cannot enforce the law appropriately. Nor are there yet alternatives provided to provide incentives for the cessation of subsistence logging. Additionally the role of mass organizations, such as the Women's Union, War Veteran's Association, Farmers' Union, Youth Union and the People's Council in forest protection and development is unclear.

3.3 Summary of subsistence use of *Fokienia hodginsii*

The subsistence use of *F. hodginsii* timber in Nam Xay commune, Van Ban district, and Ngoc Chien commune, Muong La district, is widespread. All households in the surveyed villages use the timber to some extent.

Timber is most often used for local construction purposes, such as house building, but also for carving furniture. According to local people there are three types of *F. hodginsii* tree, of which the tree providing yellow wood is the most widely used (most suitable for construction and furniture making) and the type that is valuable and commercially available. Traditionally most *F. hodginsii* trees are harvested when they have attained a dbh of greater than 100 cm (c.f. legal harvests must be over 120 cm in diameter) but increasingly trees of smaller girth are being felled for use. The reason for this lies in the local exhaustion of larger trees resulting in long distances to harvest sites and/or selection of smaller trees closer to residences. Harvesting of *F. hodginsii* can be conducted year-round and time taken to harvest and pre-process timber at the extraction site varies depending on the size of the labour force and amount of timber required. The amount of *F. hodginsii* timber used depends largely on ethnic traditions with Thai people building entire stilt houses from the wood (on average approx. 25 m³ timber) while H'mong and Dao commonly limiting use to poles and roofing materials (up to 12 m³ timber). Amount extracted is also a function of wealth and social standing with larger, richer households extracting the greater amounts. Timber is also used locally for furniture and coffin making. In general, usage appears to have remained relatively constant over time and volumes required have been a function of population (or household numbers) increase; however, in some areas interviewees state that as *F. hodginsii* has become locally rarer, use has concomitantly decreased with several other timbers also utilized (see below).

F. hodginsii trade is also large in scale. Local farmers are often employed by timber dealers, either local traders or traders from larger, farther away towns. Some traders may also hire loggers from other areas to extract timber from these communes. Timber from Nam Xay commune is usually traded in Than Uyen town (Lai Chau province); timber from Ngoc Chien commune is most often traded in Nghia Lo town (Phu To province) or Muong La town. The profits gained by traders in Muong La can be 3 – 4 times that of local loggers in the commune. In most areas surveyed, while subsistence use has remained relatively stable, illegal trade has increased dramatically. In Nam Xay commune, some local farmers have decided to farm Cardamom which brings high income at low risk; in these cases local people are less involved in timber trade. However, while this is true for some farmers many others still conduct illegal harvesting for trade, and many loggers from outside the areas also continue to fell trees illegally for trade.

Enforcement of forest protection laws in the communes is difficult and hampered by poor forest ranger equipment, few ranger numbers, an increase in *F. hodginsii*-forest access and a lack of incentives for rangers conducting a difficult and dangerous job. This issue is compounded, for example, in Ngoc Chien commune by local authorities allowing the uncontrolled harvest of timber from areas of planned flooding from the Ta Bu hydropower dam. The threat of resettlement of some villages due to flooding has also meant that many, if not most, households in these villages have recently harvested enough *F. hodginsii* to build another house after resettlement (see figure 11).

Figure 11: *F. hodginsii* timber is harvested and stored under houses in Khau Vai village, Ngoc Chien commune in order to build new houses after resettlement



Photos: Le Quang Trung/FFI

Figure 12: Due to legal issues and the scarcity of *F. hodginsii* timber, some households in Nam Xay commune are beginning to use corrugated cement roofs instead of *F. hodginsii* roof tiles



Photo: Le Quang Trung/FFI

Conclusions

4.1 *Fokienia hodginsii* trade and use framework

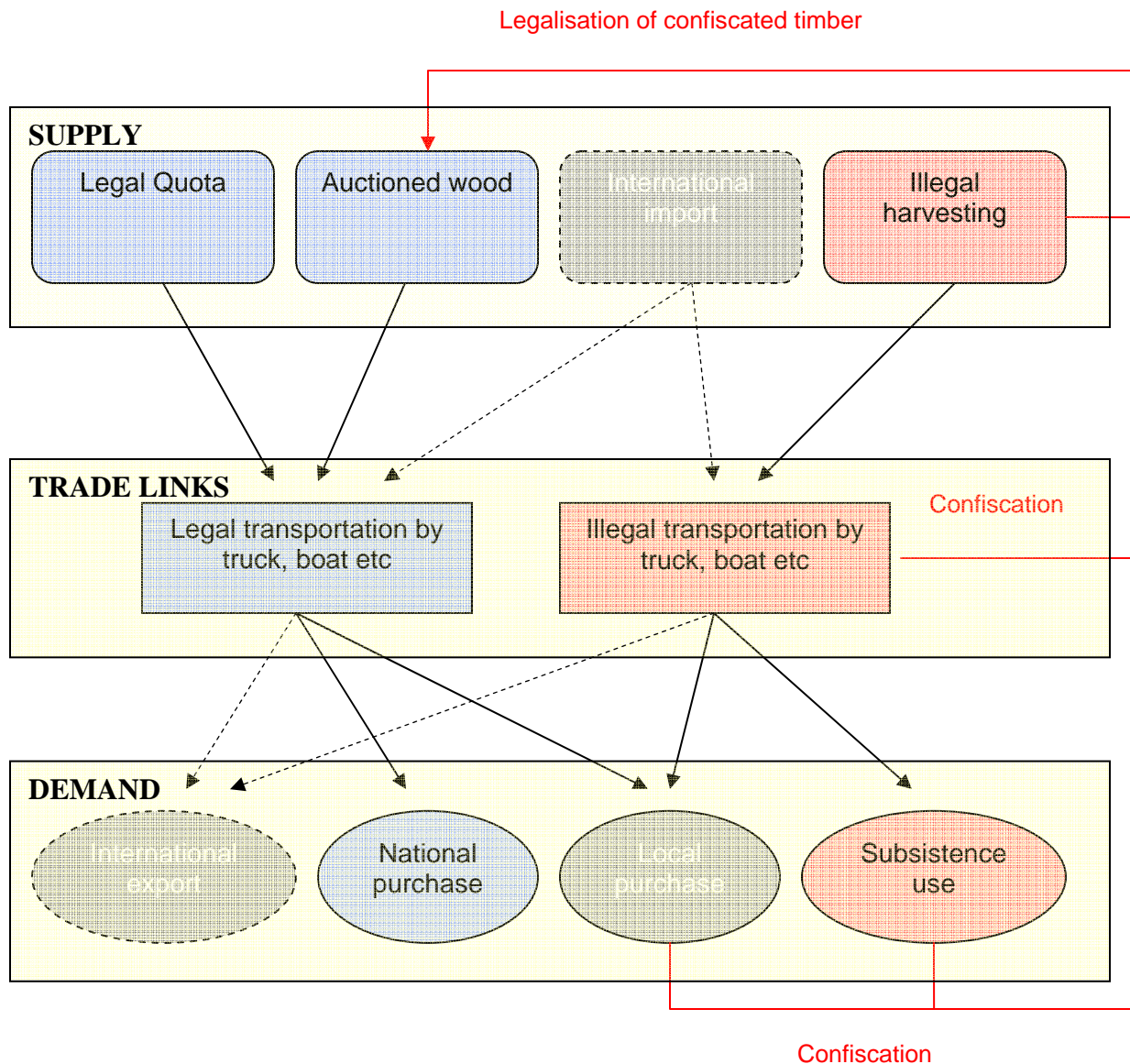
Figure 13 provides a basic, simplified framework for *F. hodginsii* which can also be adapted for other timber species. This framework is provided as a generalization that is applicable for any province in Vietnam within which *F. hodginsii* occurs. The trade framework for *F. hodginsii* can be divided into three main sections: supply, trade links and demand.

There are four potential supply sources for all the *F. hodginsii* timber currently in the Vietnam market:

- 1.) The government-sanctioned quota that allows a province to harvest the dead timber legally from their State Forest Enterprises (see section 1.2.1 for details). This timber is then sold to other pPCs for 'special' purposes (as per Decision 48 (see section 1.2.1)) and legally transported by truck or boat to the purchasing province. Much of this timber is used in decorating government buildings or making state furniture.
- 2.) Illegally harvested timber that has been confiscated by law enforcement agencies is auctioned to government bodies or legally-registered timber processing sawmills (or workshops). The legalised timber must carry an official FPD stamp for proof of legality. Such timber is regularly used for making doors and window frames and for other construction purposes or used to make furniture. It is generally the more wealthy persons who purchase such products.
- 3.) Timber can enter the country through an international border crossing. This timber can, in theory, be either legal or illegal. There is currently no legal international import or export of *F. hodginsii* into or out of Vietnam so any cross border movement of this wood is illegal.
- 4.) The last supply entity is that of illegally harvested timber. Such timber is abundant both in trade and subsistence use. Illegally harvested timber is utilized by local communities primarily for construction purposes.

However, the majority of such illegal timber enters the timber trade either because a.) local people require the income to subsist, and/or b.) income derived from the commercial trade of *F. hodginsii* timber can be very high. It is this timber that, when confiscated by local authorities, re-enters the framework via 'legalising' auctions.

Figure 13: Simple schematic representation of the *F. hodginsii* timber trade framework



Notes:

Blue colour represents legal activities only;
 Red colour represents illegal activities only;
 Grey colour represents both legal and illegal activities;
 There is currently no legal international import or export so these categories are 'dotted';
 Red lines represent confiscated illegally harvested timber and points of confiscations; this timber is subsequently auctioned and re-enters the framework as legal timber.

4.2 Constraints of management and control of legal timber trade activities

- The data collected on the *F. hodginsii* timber trade from 2001 to 2005 in the surveyed districts did not collect timber confiscation data from adjacent districts and it is likely that this sample is missing some illegal timber that originated from the survey area.
- The national economy of Vietnam is transforming into a socialist-orientated market economy. As a result forest protection regulations are increasingly opening up and so providing greater difficulties for forest protection in general and the protection of *F. hodginsii* in particular.
- Most local people living in areas containing *F. hodginsii* forest are from ethnic minority groups. These people often have poor education, poor healthcare, a low incomes, dependence on forest resources and lack access to alternative incomes. These are often the people who are harvesting timber illegally (often under contract by outside timber traders – see section 4.4 below) and, therefore, the people who are caught by the forest protection authorities. However, for many people, violations cannot be penalized through fines due to a lack of both disposable income and assets. In these cases no action is taken which in turn leads to poor law enforcement, not just with regard illegal forest activities, but also illegal activities in general.
- Access to *F. hodginsii* forests is increasing as transportation routes have been upgraded over recent years. Ease of timber transferal has increased and necessitates more thorough vehicle checks, documentation checks etc. However, with a greater number of vehicles on the roads these checks are increasingly difficult and comprehensive enforcement problematic.

4.3 Illegal *F. hodginsii* trade in Bac Yen and Van Ban districts

- Timber workshops in Bac Yen district (and Phu Yen district also) are using large quantities of illegal *F. hodginsii* timber, greater than can be explained through the purchase of auctioned timber alone. Therefore the supplying source of workshop timber is mainly through illegal harvesting.
- Transportation is conducted mainly through manual means to areas with roads access (and further to town if timber is sold on a small scale for household income only); timber is then transported by trucks, cars, motorbikes and other vehicles, or by river (for larger scale trade).
- Timber is generally exported out of Bac Yen as logs or pre-processed timber.
- According to local informants the level of trade of illegally sourced *F. hodginsii* timber appears to have decreased over the last few years due to both stricter law enforcement and increased logistical difficulties in timber harvesting (such as distance to large trees); however, much timber is still exported from the district (to towns such as Viet Tri in Phu Tho province) without passing through the district centre, Bac Yen town.
- Management work of forest protection authorities in Bac Yen is weak and not synchronous due to low technical capacity, a lack of incentives for law enforcement as well as poor topographical conditions and difficult access.
- Overlapping areas (i.e. cross border forests such as Ta Xua nature reserve which also crosses the district border into Phu Yen district) have not been assigned specialized management staff for forest protection.

- Trade in illegally sourced *F. hodginsii* in Van Ban has also decreased in recent years due, in part, to greater enforcement combined with an alternative, high value income in Cardamom production.
- While overt trade in *F. hodginsii* has apparently decreased any amount required is still available on request.

4.4 Subsistence use and trade of *Fokienia hodginsii* in Ngoc Chien commune, Muong La district and Nam Xay commune, Van Ban district

According to the surveys conducted in these two communes, the initial results suggest that the living conditions of people in these areas remain extremely difficult. Livelihoods of local people mainly consist of wet rice production, livestock rearing, upland cultivation, ineffective small household farms, and a major part of the population are involved in forest product exploitation activities (see Annex 6 for further details).

However, it appears that people living in Ngoc Chien commune harvest much more *F. hodginsii* timber than those from Nam Xay commune, mainly for the following reasons:

- Most of the population of Ngoc Chien commune consists of ethnic Thai. Thai people traditionally build stilt houses entirely of *F. hodginsii* while the H'mong and Dao, who comprise the majority in Nam Xay commune, use two to three times less in their house construction practices.
- The geographical location and topographical conditions of Ngoc Chien commune are easier for harvesting within the commune and for non-local harvesters traveling to the forest, as well as transportation of cut timber than people living in and around Nam Xay commune.
- The resettlement programme for local people currently living in the planned flooding areas of the new hydro-power plant has led to people cutting and storing timber for new house building in the resettlement areas.
- The policy of “tan thu” (collect everything), a method of reservoir basin cleaning and extraction of forest resources before inundation, has not been implemented, managed and controlled efficiently. Confusion has led to timber being extracted from areas that will not be flooded.
- Nam Xay people are still able to access nearby forests and cultivate Cardamom (*Amomum aromaticum*) which has high, legal economic trade value; many households earn a considerable income from cultivating this species and have chosen to earn money this way rather than through illegal logging of *F. hodginsii*.

It appears from these surveys that the exploitation, utilisation and trade of *F. hodginsii* timber by local people has decreased in recent years. The harvest of timber by local people for sale is not as extensive as before. There are many reasons for this situation (see section 3.2), including legislation and policy enforcement (particularly for Nam Xay commune and Van Ban as a whole). Though local people in Ngoc Chien and Nam Xay do have logging incidents, increasingly illegal harvesting issues revolve around outsiders who come to these two communes to exploit this high value timber. This survey has also made it clear that the driving force behind the illegal harvesting of *F. hodginsii* timber in these areas is less through extraction for subsistence use and more through requirements of timber traders supplying non-local markets.

4.5 Assessment on the level of threats posed to *Fokienia hodginsii*

In developing an assessment for *F. hodginsii* it is necessary to look at the main supply areas: legal harvesting through the quota system; volumes of timber entering auctions; international import; and illegal harvesting for subsistence and trade. Of these there is no international trade, and official figures for quotas and auctions can be derived from official records. Data for illegal activities, by their very nature, are hidden and records are not recorded. This area is, therefore, subject to a certain amount of speculation and data on *demand* (as opposed to just *supply*) must also be taken into account.

Data was gathered for areas in Son La and Lao Cai provinces. Unfortunately, due to problems with survey permission in some of these areas, data gathered is not uniform between surveys on the illegal trade in district towns and surveys on subsistence use. Nevertheless, broad extrapolations can be made particularly regarding subsistence use through consistency in use practices by local ethnic groups.

Son La

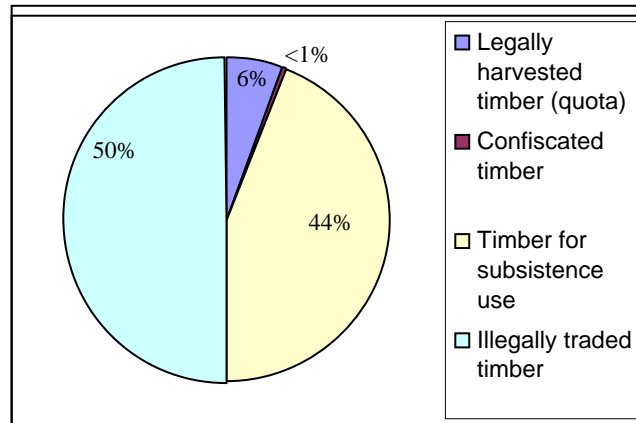
Legal harvest data suggests that 3,314.9 m³ (75% of the 4,394.9 m³ quota) was harvested from Son La (Muong La and Phu Yen SFEs) over a five year period from 2001 to 2005 (see section 1.2.3).

Volumes of *F. hodginsii* timber confiscated over the same period amounted to 342.7 m³ of timber from Muong La and Bac Yen districts alone (no data for the whole of Son La province; if this data is required each district must be assessed independently). However, if it is assumed that all *F. hodginsii* forest-containing districts (see section 1.2.2 and Annex 3) have the same level of confiscation, and that districts without *F. hodginsii* forest have none, it can be estimated that perhaps approx. 1,000 m³ timber may have been confiscated as a whole from the province from 2001 - 2005.

The illegal use and trade of *F. hodginsii* timber can be divided into two sections: firstly purely for subsistence use (i.e. logging of trees for the purpose of house construction and everyday household use) and secondly for commercial trade. Subsistence use varies according to ethnic group with Thai constructing entire houses from *F. hodginsii* (approx. 26 m³ per house) and H'mong and Dao using the wood for essential supports only (approx. 12 m³ per house). Data from Hang Chien 1 village in Ngoc Chien commune, Muong La (see section 3.2.1.2) suggests that 6 – 7 houses per year are constructed in the village, or approx. 21 houses per year for the commune, or approx. 550 m³ timber per year for the commune. If it is assumed that all (and only) six communes in Muong La that contain *F. hodginsii* forest (see Annex 3) utilize approximately the same amount of timber as Ngoc Chien then Muong La district may use approx. 3,300 m³ *F. hodginsii* timber per year for subsistence use. However, data on ethnicity distribution for the whole of Muong La was unavailable so it is unlikely that this figure is accurate. Data regarding levels of trade in illegally harvested *F. hodginsii* timber are not available. If it is assumed that trade levels are proportional to forest size, then extrapolating from Annex three and trade levels from Bac Yen district (see below) would suggest 3,800 m³ of illegally harvested *F. hodginsii* is traded annually from Muong La (see Figure 14 for speculated volumes of timber from Muong La). However, in real terms there are many other factors which affect trade levels (ease of access, topography, enforcement levels etc) as well as the fact that communes without *F. hodginsii*-containing forest are also likely to harvest timber for subsistence use, and such an assumption is provided on a purely speculative basis. In fact, informant information from

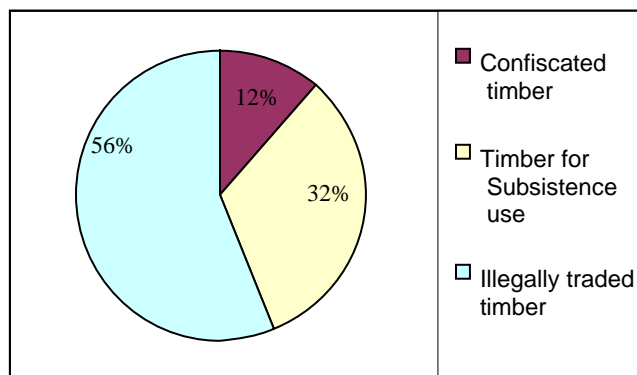
Muong Chien, Bac Yen and Son La town suggest that levels of trade of *F. hodginsii* timber from Muong La are much higher than outlined in this assessment.

Figure 14: Speculative proportions of *F. hodginsii* timber from Muong La district



There is currently no legal harvesting from Bac Yen district; harvesting occurs entirely illegally for both subsistence use and trade. There are only three communes in Bac Yen district that contain *F. hodginsii* forest (see Annex 3). Based on the assumptions that intensity of *F. hodginsii* use, and increase in number of household numbers is equivalent to that of Muong Chien, that villages are approximately the same size (same number of households) and there are four villages per commune, then within these three communes alone approximately 80 new houses are built per year. Of these, almost all are of H'mong ethnicity. According to information gathered in this report, H'mong use an average of approximately 10 m³ *F. hodginsii* during house construction. Assuming this is the case then approximately 800 m³ for *F. hodginsii* is utilized for subsistence construction purposes annually (only consideration for the communes containing *F. hodginsii* forest). Estimated average levels of trade conservatively suggest that 115 m³ per month (or 1,400 m³ annually) of illegally harvested timber is being traded either within or out of Bac Yen district. The total illegal use of *F. hodginsii* in Bac Yen is estimated at 2,200 m³ per year (see Figure 15).

Figure 15: Speculative proportions of *F. hodginsii* timber from Bac Yen district



Surveys conducted in Bac Yen district suggested that 120 m³ *F. hodginsii* timber is traded out of the district monthly (or over 1,400 m³ annually). Direct comparison between Bac Yen FPD confiscation data and these trade data suggests that Bac Yen FPD only confiscated approximately 4% of the illegally sourced timber. Many informant sources suggested that levels of illegal exploitation of *F. hodginsii* timber for trade were much greater for Muong La than Bac Yen. If this is the case then the efficiency of Muong La FPD in confiscating *F. hodginsii* must be much lower than Bac Yen (who confiscated over five times more *F. hodginsii* timber than Muong La FPD).

While it is not possible to compare Muong La and Bac Yen directly (due to non-conformity of data) it appears clear that the volume of illegally harvested *F. hodginsii* timber in the surveyed areas far exceeds legally-sourced timber.

Lao Cai

Legal harvest data suggests that 1,954.8 m³ (24% of the 8,222.2 m³ quota) was harvested from Lao Cai (Van Ban SFE) over a five year period from 2001 to 2005 (see section 1.2.3).

Volumes of *F. hodginsii* timber confiscated over the same period amounted to 119.0 m³ of timber from Van Ban district alone (no data for the whole of Lao Cai province; as with Son La above, if this data is required each district must be assessed independently). However, if it is assumed that all *F. hodginsii* forest-containing districts (see section 1.2.2 and Annex 3) have the same level of confiscation, and that districts without *F. hodginsii* forest have none, it is possible to estimate that perhaps approx. 240 m³ timber may have been confiscated as a whole from the province from 2001 - 2005.

Subsistence use data from Nam Xay commune suggests that use of *F. hodginsii* is much reduced. While data regarding new-house building was not available, communal statistics suggest that 11 new households were built between 2004 and 2005 (see Annex 6). With a population of approx. 95% H'mong or Dao it is possible to estimate that approx. 130 m³ *F. hodginsii* timber is extracted from the commune for subsistence purposes (ave. 12 m³ *F. hodginsii* timber used per house) for one year. If it is assumed that all seven of the *F. hodginsii*-containing forest are similar in statistics then it is possible to estimate that approx. 910 m³ per year is being harvested for subsistence purposes.

Data on the trade of *F. hodginsii* in Van Ban district is not available as surveys were not permitted (in any district for Lao Cai province).

However, even without data on the illegal trade of *F. hodginsii* in Van Ban it is clear that subsistence alone utilizes more *F. hodginsii* timber than legally sourced timber.

Discussion

5.1 Survey confidentiality

One of the essential elements for successful research into the illegal trade is confidentiality. The original plan was to allow very few people knowledge of survey activities i.e. conduct an undercover survey, the rationale being that if any trader knew we were conducting a survey with the FPD they would not provide us with information in fear of potential recrimination and loss of livelihood. Through this mechanism it was hoped that only the Directors, or other senior provincial FPD figure, would know the true purpose of the research. However, from the outset it was clear that such confidentiality was compromised and unworkable; for example:

- Initial meetings between the Project Coordinator, National FPD staff and FFI translator and provincial FPDs involved three (Lao Cai) and five (Son La) provincial FPD staff *even after requesting meetings with just one person*;
- Training workshop involved senior FPD members from Son La; and FPD rangers from the proposed districts of survey operation *even after the request of junior FPD members from the provincial centre, or districts other than those of proposed operation*;
- [Son La] provincial People's Committee introduced the survey team to Bac Yen district People's Committee and the survey team was subsequently called before the district People's Committee standing committee (and district police and FPD representatives) to explain their proposed work;
- [Son La] provincial FPD informed Bac Yen district FPD of the survey team's survey objectives; the district FPD subsequently overtly visited the survey team regularly in Bac Yen town;
- Phu Yen district FPD was also aware of the survey team's eventual arrival in Phu Yen district.

With such a lack of confidentiality it was clear from the outset that the amount of useful information might be limited; and the quality of such information also in some doubt. While this report cannot categorically say that information was compromised, some conformity of data (see below) suggests that limited dialogue at least exists between some authorities and some timber traders. Indeed, several senior provincial and district figures are also implicated by the results. Clearly, with many senior provincial and district figures aware of the survey, and several figures actively involved with illegal trade or purchase of *F. hodginsii*, the amount and value of data gathered is likely to be limited.

For surveys in each province (Son La and Lao Cai) two FPD staff from the other province conducted the research i.e. Lao Cai FPD carried out the research within Son La province and *vice versa*. In this way it was hoped that:

1. There would be limited chance of recognition of researchers by local authorities;
2. There would be limited compunction on behalf of the surveyors to hide results for fear of consequences to them or their seniors by provincial authorities;

The survey team also attempted to travel to Phu Yen undercover – in order to maintain confidentiality. However, as with Bac Yen district, it appeared that the Phu Yen FPD were informed of the possibility of the team's arrival – and actually visited the team in their hotel. It was, therefore, assumed that as with Bac Yen FPD there would be some level of interaction between the Phu Yen FPD and timber traders.

5.2 Levels of exploitation of *Fokienia hodginsii*

The basic mechanism for trade and use dynamics for *F. hodginsii* is relatively simple in concept but difficult in practice. Indeed, it is unlikely that anyone has an accurate idea of the level of trade of the species because the illegal trade is very secretive. Nevertheless, it is clear from the limited information gathered in Son La and Lao Cai provinces that current (i.e. to the end of 2005) legal exploitation of the species likely poses only a limited direct threat. Of greater concern is the illegal use and trade. Traditional subsistence use by local ethnic groups use high levels of *F. hodginsii* timber in construction, with the Thai in Muong La using more than twice the amount of both H'mong and Dao groups. While it is unclear as to the exact volume of subsistence use of *F. hodginsii* timber in Bac Yen district (where the population in the communes is composed of H'mong), approximate illegal trade figures put the illegal trade at 100 – 130 m³ per month. This, however, is much reduced from five years ago and local informants suggested that the volume of *F. hodginsii* timber traded from Muong La far exceeds that of Bac Yen.

While figures for both illegal trade in Muong La district and subsistence use in Bac Yen district are unclear, the general indication is that the illegal trade in *F. hodginsii* is high. It is, however, necessary to distinguish between the illegal harvesting of the timber for subsistence and trade. The former is often necessary for local people who have little or no choice but to harvest the wood while the second is demand driven by people who *actively* choose this particular wood. Subsistence demand is predictive and relatively stable (and can be seen as being a function of population increase) except in certain cases (e.g. mass harvesting for dam development or household relocation issues as in Son La) though demand, according to local informants, appears to be decreasing due to extraction difficulties and stronger local enforcement.

Harvesting for the illegal trade, however, is unpredictable and is likely a function of purchasing wealth. Harvesting for trade is undertaken both by outsiders and local people. Outsiders are hired by timber traders and go to an area to extract the timber; local people also mostly harvest under contract to the trader. However, it is clear from section 3.2.1.3 that local loggers conduct this trade more out of necessity than greed; conversely, it is the high demand price that traders can control (sale of furniture can increase four-fold between village and district centre) that drives their motivation. Furthermore, prices (of illegal *F. hodginsii* timber) per m³ at market can increase from 2 – 3 million VND in Muong La to 9 – 10 million VND in Son La (see table 13). Prevention of illegal harvesting of timber should, therefore, target the consumers of the trade (including the dealers) and not focus on local loggers who conduct the practice out of necessity (for income).

Development of access roads and local policy towards timber extraction can also increase exploitation of the timber. Access roads will ease transportation of timber and facilitate access to previously restrictive sites. Local policy and its enforcement will also either ease or strengthen control of exploitation.

The situation in Muong La, for example, is compounded specifically by the development of the Ta Bu hydropower plant and reservoir. During the survey in one village, Khau Vai, it was noted that almost all households had harvested and stored (beneath their houses) enough timber to build entirely new houses after resettlement. While Khau Vai village is to be flooded under the reservoir development plans, the situation is not unique to this

village and information suggests that many villages are following suit. Furthermore, the local SFE and authorities have unofficially allowed local people to extract as much timber as desired from areas that are to be inundated. This lax policy has clearly proved detrimental due to:

- A lack of clarity as to exactly which areas can be harvested; the exploitation of *F. hodginsii* trees from areas that will be above the waterline;
- Low staffing numbers and little time for management; and
- Weak legislation regarding action against illegal harvesting.

With this policy it is also very difficult to control the wholesale harvesting of timber not just by local people but also by loggers from outside the area. Confiscation of illegally harvested timber by local enforcement agencies also appears limited and control by authorities at the communal and village levels minimal. Access to the *F. hodginsii*-containing forests is improving with the development of asphalt roads to ease dam construction and this in turn allows increased ease of extraction and transportation of illegally harvested timber. Muong La district (and particularly Ngoc Chien commune), therefore, can be seen to be currently undergoing a 'logging boom'.

Conversely, surveys in Nam Xay commune, Van Ban district, indicate a much lower consumption of the timber for subsistence, and a reduced trade. Reasons for reduced use/trade of this species are attributed to a combination of greater enforcement by local forest protection officials, and subsequent threat of fines or imprisonment, and an alternative risk-free (regarding illegal logging) high income from the cultivation of Cardamom (*Amomum aromaticum*). However, this alternative income mechanism may have environmental considerations (and market considerations) that require assessment before extensive application should be endorsed (Buckingham and Tu Minh Tiep, 2003). Nevertheless, survey results from Van Ban suggest that any amount of *F. hodginsii* timber is still available for those who require it.

Assumed figures on harvesting pressure (section 4.5) show that the current level of harvesting of *F. hodginsii* from Bac Yen district may be unsustainable in the long term. Speculative (conservative) results suggest that 800 m³ *F. hodginsii* timber is harvested annually for subsistence use and 1,400 m³ for trade. Based on research conducted in Bac Yen town a *F. hodginsii* tree of 100 cm d.b.h can yield approx. 1.5 m³ timber suggesting a minimum total annual harvest of approximately 1,500 trees (assuming harvesting of trees with an average 100 cm diameter). Density of *F. hodginsii* is not known, and is likely to be variable so estimates of area of forest degraded by logging cannot be made. However, official estimates by Bac Yen FPD (*pers. com*) suggest that only 6 – 7 ha of forest are lost annually to timber extraction. The actual figure of forest *affected* by logging the timber will be far greater as the tree is selectively felled. If, for example, it is speculated that there are only three *F. hodginsii* trees of over 100 cm d.b.h per hectare then approximately 500 hectares will be directly affected by the action of logging, and many more indirectly through timber transportation and associated activities.

5.3 Local perceptions of *Fokienia hodginsii*

The perception of the status of *F. hodginsii* varies from the provincial centre to local, village level. *F. hodginsii* timber in Son La and Lao Cai is very much a luxury timber, used to show off ones wealth; yet it has utilitarian value in that the wood is durable and light. Nevertheless, high prices in provincial centres restrict the purchase of items made

from the wood to wealthy households. *F. hodginsii* products for sale in the provincial centres are, generally, assumed to be legal timber (i.e. auctioned timber). At the district centre level, while still a luxury wood, prices are lower and more people can afford to buy the wood. However, it is more commonly seen as a utilitarian wood due to its excellent physical qualities. Much of the timber is known to be illegal though is usually 'mixed' or processed with auctioned timber and remains ambiguous in origin. At the communal and village levels, the timber is very much utilitarian and not necessarily a statement of wealth *per se*; house size describes wealth more closely. All timber at these more local levels is seen as being illegally sourced, though through necessity.

However, differences in the use and value of wood in non-monetary terms vary more obviously at the local level. Ethnic Thai people, for example, build their traditional stilt houses entirely of *F. hodginsii*, while H'mong use the wood for main poles or beams; ethnic Dao are closer to the H'mong in use patterns though some, for example in Nam Xi Tan village of Nam Xay commune, Van Ban district, do not use the wood at all but prefer to use other hardwoods such as *Michelia mediocris*¹⁸ which is also aromatic, stronger, has a smoother surface and retains colour longer than *F. hodginsii*.

From discussion and interviews with individual households, there is evidence to suggest that local awareness raising by local forest protection authorities may have been too limited and subsequently had a negative impact on *F. hodginsii* conservation. Few people are aware of any issues surrounding *F. hodginsii* overexploitation beyond that it is illegal to harvest. Efforts at making local people understand the rarity of the species has thus led to overexploitation of the timber in order for local people to ensure that they have enough wood to build new houses in the future¹⁹.

It is clear that local people are very aware of the possibility of *F. hodginsii* exhaustion yet farmers questioned during these surveys are more focused on short-term requirements (and secondary benefits such as those from trade) than long term solutions. They are aware that exploitation is more difficult than in recent years and believe that exploitation will decrease as timber disappears from near localities and a reduction in forest quality will not allow adequate regeneration. Once the *F. hodginsii* is exhausted local informants said they would use other types of timber (called miscellaneous timbers by the local people e.g. *Michelia mediocris*, *Madhuca* sp., *Vatica odorata*, *Cinnamomum tonkinensis* and *Lithocarpus* spp.).

¹⁸ *Michelia mediocris*, while widely distributed in Vietnam, seems also to be endemic to the country (FIPI 1996b)

¹⁹ One interviewee who married three years ago and recently set up a separate house for his own family in Khau Vai village (Ngoc Chien commune) claimed to have collected enough wood for wall partitioning and therefore is no longer worried about timber exhaustion. Clearly the priority for many local people in this area is to collect timber for subsistence purposes rather than for trade.

Recommendations

Recommendations are provided specifically regarding the control of the trade and use of *F. hodginsii*. Where appropriate, recommendations are highlighted where included in the National Action Plan (NAP) for wildlife trade control²⁰. A summary of NAP Actions is provided in Annex 7.

Overriding requirement

Measures must be developed to **combat corruption** amongst law enforcement agencies and officials. Severe punishments and removal from position must be implemented against any official found to be corrupt or abusing their position. Until enforcement officials act entirely within the law the following recommendations are unlikely to succeed.

6.1 Legislation and law enforcement

A number of issues regarding legislation and law enforcement have become evident during this research. These issues reflect both poor enforcement of legislation as well as shortcomings in legislation itself. By reviewing data from provincial records and that of national FPD (Annex 5), it is clear that there are a large number of violations in the forest law sector, particularly with regard timber circulation (trade), storage and processing (including harvesting). The following recommendations are suggested to assist in legislation transparency, efficiency and action:

- **Introduce a temporary ban on the entire legal trade of *F. hodginsii*. This ban should be enforced until such time as corruption has reduced and enforcement increased (until at least 2010 when the situation should be reviewed). Included must be the cessation of auctioning of *F. hodginsii* timber (which should be stockpiled until the review has been conducted).**
- Abolish provincial harvesting quotas with immediate effect. New quota applications should not be approved.
- Maintain the current ban on international import and export of *F. hodginsii*.
- Develop legislation to close the loophole allowing any species of illegally harvested timber to be hidden in legal consignments. All timber dealers must be registered (with registered premises) and demonstrate a clear paper trail from purchase to sale. Buyers should maintain the same paper trail to ensure transparency. Forest protection agencies, or a multi-task force, should be charged with regular and frequent spot checks on workshops and assess log books thoroughly. Severe penalties must be administered to those who mismanage the paper trail and who are found to be trading in illegally sourced timber.

²⁰ Decision 1021/2004/QĐ-TTg dated 27/09/04 on approving an Action Plan to strengthen the control of trade in wild fauna and flora to 2010.

- Forest rangers require more comprehensive training in law enforcement skills, including investigation techniques, for timber and other forest resource management (Article 1, Actions 1 and 7 of the Action Plan).
 - Consideration should also be given to developing a mobile task force composed of national FPD and other agency personnel (as per Directive 12²¹) and train them in investigation techniques (included in Article 1, Action 6 of the Action Plan); the task force should have the power to assess any geographical area of jurisdiction regarding illegal forest product exploitation (see above also).
- Develop incentives and/or a reward scheme acknowledging rangers' and other law enforcement officials' high quality work.
- Local authorities such as the pPC should develop more concrete, transparent legislation for local communities, particularly for sensitive areas (such as Ta Bu dam area) (under Article 1, Action 5 of the Action Plan). Such legislation should be made in conjunction with, and accessible to, local communities and should be enforced thoroughly to prevent local communities (and outsiders) from exploiting resources illegally and unnecessarily.
- Illegal activities and subsequent penalties should be enforced thoroughly and brought to a swift conclusion. In order for this to occur, the entire chain of enforcement needs to be strengthened at all levels and involving the appropriate government authorities including FPD, police, border police and judiciary (Article 1, Action 7 of the Action Plan). Such enforcement needs to be ensured *at all times*.

Some information gathered during this survey suggests the involvement of senior government authorities, including forest protection, in conducting or facilitating illegal timber trade and use activities. Recommendations also therefore include:

- Develop, and enforce, a system of penalties for FPD and other government authorities (at the local and regional level) found to be corrupt, based on position of seniority. Penalties should also be administered to authorities guilty of not enforcing the law.
- Review existing relationships between timber dealers and SFE staff

It is also apparent from this survey, as well as news in the public domain, that safety issues are becoming more urgent as loggers of illegal timber become more aggressive, especially non-local loggers.

Consideration should also be given to:

- Increased self-defence training should be carried out using specially trained dogs for protection.

²¹ Directive no. 12/2003/CT-TTg dated 16/5/2003 on *strengthening with urgent measures for forest protection and development*.

- Increase provincial and district cross-border cooperation of FPD and other forest protection agencies (Article 1, Action 6 of the Action Plan) to prevent outsiders (who, according to data gathered during this survey, are often more aggressive) crossing borders to extract timber and other forest products. For example, currently there is some collaboration between Son La and Yen Bai pPCs, but none between pFPDs. Increased enforcement activity during the common hours of law transgression (such as at night and lunch times) should also be established. Enforcement options should focus on outside loggers who are driven by demand rather than local, subsistence-use loggers who are driven by necessity.
- Develop a national campaign targeting end users of *F. hodginsii* and raising awareness of the issues of *F. hodginsii* trade and use; and informing users and traders of illegal timber of the penalties associated with illegal activities (Article 1, Action 2 of the Action Plan).

6.2 Local initiatives and issues

Action taken at the local level can, arguably, be the most effective at controlling over-exploitation of forest resources such as *F. hodginsii*. Without local interest, cooperation and involvement effectiveness of any initiative is likely to be short-term and minimal. However, it is mostly non-local loggers who pose the greatest threat to *F. hodginsii* populations with high demand in large towns and resulting high income from sale.

Consideration should be given to the following recommendations:

- Natural resource management roles of local authorities should be shared with local people, thus reducing staff workload while increasing management effectiveness²².
 - Develop community-managed nurseries selling seedlings to government reforestation and production schemes. This is already occurring on a pilot basis as part of the HLSP with the conifer species *Taiwania cryptomerioides*.
 - Establish propagation areas *in-situ* and control access to these areas.
- Make local people responsible for the forest with *F. hodginsii* through the development of stewardship initiatives and a reward scheme for adequate protection of the trees. A pilot scheme has recently been started in the Central Highlands following this approach²³ and although no results are available yet the basic mechanism could be attempted for *F. hodginsii*-containing forest land. Under this agreement forest protection contracts would be assigned to willing

²² See Asian Development Bank (1997), GTZ (2004) and International Development Research Centre (2005) for examples of successful approaches.

²³ Decision 304/2005/QĐ-TTg dated 23/11/05 by the Prime Minister on *the pilot allotment of forests and contractual assignment of forests for protection to ethnic minority households and communities in hamlets and villages in the central highlands provinces*.

participants who would 'manage, protect and use forests for proper purposes'. Participants would be paid a fee for forest protection as well as other financial support and food.

- Increase awareness in local communities regarding the values of *F. hodginsii*, the risks of over-exploitation and sustainable use of the timber (Article 1, Actions 2 and 3 of the Action Plan).
- Assess viable alternative construction materials *in collaboration* with local people and consider subsidizing the use of these alternative materials (Article 1, Action 12 of the Action Plan). Consideration should be given to environmental and health aspects (e.g. the use of composite fiber cement materials, recently used in roofing, that may pose health problems).
- Enforcement options (at the local level) should target timber traders specifically as it is they who provide a mechanism for illegal timber trade. Such options should include harsher penalties and incentives against continued illegal trading. Local authorities should be held responsible for illegal activities continuing within their jurisdiction (Article 1, Action 6 of the Action Plan).
- Develop clear and effective regulations and strategies to address natural resource management issues in areas of major infrastructure development, especially near dams and roads (Article 1, Action 5 of the Action Plan).
- Reassess resettlement plans and involve local people (those being relocated) in the design and planning processes.
- Research high-income, legal alternatives to *F. hodginsii* harvesting for trade (Article 1, Action 12 of the Action Plan). Such alternatives should recognize suitable management of activities both from an economic and environmental perspective.
 - One potential example is the development of a tea growing and processing facility in Ta Xua commune in Bac Yen district. Tea from this area is said to be exceptional in quality and of very high value. However, low district investment capacity has restricted development of this potential industry. Issues regarding the environmental impact of such industry should be assessed before initiating any action e.g. impact on Ta Xua nature reserve.

6.3 Biological research

Current levels of information regarding the biology, and particularly ecology of *F. hodginsii* are limited. However, this information is crucial in addressing questions of conservation and sustainable harvesting, including regeneration, of the species *in situ*. To do this it is necessary to research current standing areas of *F. hodginsii*-containing forest and develop research sites that can act as a template for the forest in general. Data from these sites can then be extrapolated and used to estimate current standing areas of forest. Suitable sites can be found through the use of remote sensing technology (Osborn, 2004) and subsequent ground truthing.

- Conduct remote sensing and field surveys to ascertain:
 - approximate standing volume of harvestable *F. hodginsii* (over 100 cm diameter)
 - approximate standing volume of *F. hodginsii* forest in general;
 - regeneration of *F. hodginsii*;
 - age class mapping;
 - densities of trees in various forest types at different altitudes;
 - population composition of red, white and black *F. hodginsii*
 - impact of selective logging of *F. hodginsii* on the forest ecosystem in general
- Research other *in-situ* ecological aspects of *F. hodginsii*
- Develop comprehensive map of *F. hodginsii* forest coverage in Vietnam

Other biological research is also recommended in order to assess the potential for alternatives to the use of *F. hodginsii*:

- Research viable alternatives for *F. hodginsii* use
- Research into the potential for Cardamom (*Amomum aromaticum*) cultivation as alternative income means outside of natural forest, including an assessment of negative impacts (such as forest thinning). There is a need of further studies of biological characteristics, economic value, market demand as well as assessments of Cardamom agroforestry models of cultivation.

6.4 Socio-economic research

The socio-economic research outlined in this survey has been limited by time, scope and the acquisition of government permission. It must therefore be considered preliminary and would be complemented by more varied and thorough research in other geographical areas over longer time periods. Recommendations therefore include:

- Conduct field surveys to further assess local use of *F. hodginsii* (according to ethnic group) particularly those ethnicities not covered in this report
- Conduct field investigations to assess local human population sizes in all areas of *F. hodginsii* occurrence
- The study of illegal timber trade activities including *F. hodginsii* timber is still far from sufficient compared to the scale and degree of this activity. Further research into the trade in illegal *F. hodginsii* should be conducted to produce a clearer picture of the current situation regarding the exploitation of this species (Article 1, Action 13 of the Action Plan). However, it is clear from this survey that confidentiality is a prerequisite but difficult to employ. Surveys should be permitted to be conducted employing FPD staff (see below) who have no connection to the areas of survey. Surveys should not have to register activities with provincial or district authorities.
- Research viable alternatives for popular demand of *F. hodginsii* beyond subsistence use (Article 1, Action 12 of the Action Plan).

References

- Anon (1996) Sach Do Vietnam Phan Thuc Vat [Red Data book of Vietnam - in Vietnamese]. Science and Technology Publishing House, Hanoi.
- Asian Development Bank (1997) Forestry Sector Project. Accessed at <http://www.adb.org/Documents/RPPs/VIE/rrp-R2897.pdf> on 03/03/06.
- Buckingham, S. and Tu Minh Tiep (2003) A Rapid Characterization of Cardamom *Amomum aromaticum* (Roxb.) Cultivation in Three Villages in Van Ban District, Lao Cai Province, FFI.
- CITES <http://www.cites.org/> accessed 3 February 2006
- Enright, N. J. and R. S. Hill (eds. 1995) Ecology of the Southern Conifers. Melbourne University Press, Melbourne.
- FAO (2005) Best practices for improving law compliance in the forestry sector. Food and Agriculture Organization of the United Nations and the International Tropical Timber Organization. FAO forestry paper no. 145. Rome.
- Farjon, A. (2002) Rare and possibly threatened conifers in Vietnam. Report for the Fauna and Flora International (FFI) Global Trees Campaign & FFI Vietnam Programme.
- FIPI (1996a) Phuong an bao ve va phat trien rung Pomu bon huyen thi diem tinh Lao Cai (Scheme on measures to protect and develop *F. hodginsii* forest in four districts in Lao Cai province). FIPI, Hanoi [In Vietnamese].
- FIPI (1996b) Vietnam Forest Trees. Agricultural Publishing House, Hanoi.
- GTZ (2004) Sustainable Management of Natural Resources in Central Vietnam. Accessed at http://www2.gtz.de/vietnam/projects/projects_rural_nrm_eng.htm on 03/03/06.
- Henry and Thomas (1911) [http://www.botanik.uni-bonn.de/conifers/cu/fo/+Po+Mu+\(fokienia\)&hl=vi](http://www.botanik.uni-bonn.de/conifers/cu/fo/+Po+Mu+(fokienia)&hl=vi), accessed 5 November, 2005.
- International Development Research Centre (2005) Rural Poverty and Environment Program Initiative. Accessed at <http://www.idrc.ca/cbdrm/> on 03/03/06.
- IUCN (2004) 2004 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on 04 March 2006.
- Kuznetsov, A. (2001) The Forests of Vu Quang nature reserve. A Description of Habitats and Plant Communities. Vu Quang Nature Reserve Conservation Project.
- Lawson, S. (2004) Getting down to business: the nitty-gritty reality of halting cross-border trade in stolen wood. A case study involving Indonesia and Vietnam. PowerPoint presentation for the Environmental Investigation Agency.

Ministry of Law (1996) http://www.ilr-moj.ac.vn/law/en/1991_to_2000/1996/199611/199611060005_en/view.

Ngo Van Tri and B. Long (1999) A Survey of the Black Gibbon *Nomascus* Harlan 1826, in Son La Province, FFI.

Nguyen Duc To Luu and P. Thomas (2004) Cay la kim Vietnam (Conifers of Vietnam: an illustrated field guide). World Publishing House, Hanoi. [In Vietnamese and English]

Nguyen Hoang Nghia (2000) Results of forest tree gene resources conservation-period 1996-2000. Forest Science Institute of Vietnam (FSIV). See [http://www.mekonginfo.org/mrc_en/doclib.nsf/0/EA06CC57B86D8E2C47256CE8001897A3/\\$FILE/FULLTEXT.html](http://www.mekonginfo.org/mrc_en/doclib.nsf/0/EA06CC57B86D8E2C47256CE8001897A3/$FILE/FULLTEXT.html)

Nguyen Phi Truyen and S. Roberton (2004) An Assessment of the Threats to the Biodiversity of Phong Nha-Ke Bang National Park, Quang Binh province, Vietnam. Report No. 3: Timber Industry Framework Analysis, Quang Binh Province, Vietnam. Phong Nha Ke Bang Forest Garden Project, Fauna & Flora International – Vietnam Conservation Support Programme

Nguyen Tien Hiep, Phan Ke Loc, Nguyen Duc To Luu, P. I. Thomas, A. Farjon, L. Averyanov and J. Regalado jr. (2004) Vietnam Conifers: Conservation Status Review 2004. Fauna & Flora International, Vietnam Programme, Hanoi.

Osborn, T. (2004) Preparation and implementation of a strategy for the management of *Fokienia hodginsii* in Vietnam by 2008. A desk study for the Hoang Lien Son Project, FFI, Vietnam.

Rey-Beneyas, J.M. and Pope, K.O. (1995) Landscape Ecology and Diversity Patterns in the Seasonal Tropics from Landsat TM Imagery. Ecological Applications Vol. 5, No. 2, pp. 386–394. See http://select.biosis.org/cgi-bin/CitedRef.cgi?doc_id=-11851326 for abstract.

Roberton, S (2004a) An Assessment of the Threats to the Biodiversity of Phong Nha-Ke Bang National Park, Quang Binh province, Vietnam. Report No. 2: Intelligence-led Investigations into the Illegal Trade in Timber. Phong Nha Ke Bang Forest Garden Project, Fauna & Flora International – Vietnam Conservation Support Programme

Roberton, S. (2004b) An assessment of the threats to the biodiversity of Phong Nha Ke Bang National park, Quang Binh Province. Report No.1: Intelligence-led investigation into the illegal trade in wildlife Fauna and Flora International - Vietnam Conservation Support Programme.

Roberton, S. (2004c) Training Course on investigations into illegal trade in wildlife and timber. Unpublished report for Fauna and Flora International - Vietnam Conservation Support Programme.

Swan, S.R. and S.M.G. O'Reilly (eds.) (2004a) Van Ban: A priority site for conservation in the Hoang Lien Mountains. Community-based conservation in the Hoang Lien Mountains: technical report no. 1. Fauna & Flora International Vietnam Programme, Hanoi.

Swan, S.R. and S.M.G. O'Reilly (eds.) (2004b) Mu Cang Chai species/habitat conservation area. Community-based conservation in the Hoang Lien Mountains: technical report no. 2. Fauna & Flora International Vietnam Programme, Hanoi.

Tallents, L., Le Trong Dat, Luong Van Hao, La Quang Trung and Trinh Dinh Hoang, (2000) A Survey for Western Black Crested Gibbon in Nam Pam, Hua Trai and Ngoc Chien Communes, Che Tao-Nam Pam Forest, FFI.

Than Van Canh (2002) Technique *Fokienia hodginsii* planting. Non-Timber Forest Products Research Centre, Hanoi.

Tran Chi Trung and Mai Van Thanh (2004) Rapid Social and Threat Assessment of *Taiwania* trees located on the Van Ban District, Lao Cai and Mu Cang Chai district, Yen Bai. Fauna & Flora International Vietnam Programme, Hanoi.

UBND Bac Yen district (2005) Report on district statistics for 2005 [in Vietnamese].

UBND Muong La (2005) Report on socio-economic situation in 2004.

UBND Nam Xay commune (2005) Report on socio-economic situation in 2005.

UBND Ngoc Chien commune (2005) Report on socio-economic situation in 2005.

UBND Van Ban district (2005a) Fire prevention plans for forest in Van Ban district from 2006-2010.

UBND Van Ban district (2005b) Report on developing socio-economic conditions for 2005.

National legislation cited:

Ordinance no. 44/2002/PL-UBTVQH 10 dated 02/7/2002 of National Assembly executive committee on the administrative violation charges.

Decision no.821/1996/QD-TTg dated 6/11/1996 of the Prime minister on *F. hodginsii* wood products' harvest and exportation.

Directive no. 18-NN-PTLN-CT dated 18/11/1996 of the Ministry of Agriculture and Rural Development on suspension of *F. hodginsii* harvests and closing all forest areas with *F. hodginsii* tree allocation.

Decision no. 06-NN-PTLN-CT dated 15/02/1997 of the Ministry of Agriculture and Rural Development on strict compliance of *F. hodginsii* forest closure, suspension of *F. hodginsii* timber harvest and trade.

Official letter no. 301-KI/PC of the Forest protection department on deployment of *F. hodginsii* forest closure.

Decision no. 47/1999/QĐ-BNN-KL dated 12/3/1999 of the Ministry of Agriculture and Rural Development on transportation, production and trade of timber and forest products.

Decree no. 18- HĐBT dated 17/01/1992 of the Minister council (Government now) regulating the list of precious forest plants and animals and protection mechanism.

Decree no. 48/2002/NĐ-CP dated 22/4/2002 of the Government on amendment and supplementation of the List of precious forest plant and animal species issued in attachment to the Decree no. 18-HĐBT dated 17/01/1992 of the Minister council regulating the list of precious forest plants and animals and protection mechanism.

Directive no. 12/2003/CT-TTg dated 16/5/2003 of the Prime Minister on strengthening with urgent measures for forest protection and development.

Official Dispatch 3399/VPCP – NN dated Council of Ministers 2002 on corrections to Decision 48.

Decision no. 69/2000/QĐ-BNN-KL dated 26/6/2001 of the Minister of Agriculture and Rural Development on issuance of Regulation of the management and use of tree cutting hammer and forest ranger hammer.

Decision 1021/2004/QĐ-TTg dated 27/09/2004 of the Government on a National Action Plan to strengthen the control of trade of wild fauna & flora.

Decision no. 304/2005/QĐ-TTg dated 23/11/2005 of the Prime Minister on the pilot allotment of forests and contractual assignment of forests for protection to ethnic minority households and communities in hamlets and villages in the central highlands provinces.

Annex 1. Report on training of Forest Protection Department rangers

Background

One component of the research into trade and use of *F. hodginsii* in Lao Cai and Son La provinces is that of research into the illegal trade of *F. hodginsii* timber (see section 2). This component is arguably the most difficult of the three outlined in this report and requires discrete (or undercover) research in order to try and acquire as comprehensive and as accurate information as possible. As Forest Rangers are the main force responsible to control the illegal trade in both wildlife and timber in Vietnam, it was decided that they should be leading the data collection for the threat assessment.

However, Forest Rangers lack the skills to carry out an investigation into these trades and so a training course was developed that would provide 12 Forest Protection Department (FPD) rangers from Son La and Lao Cai provinces with the necessary skills to carry out covert investigations into the illegal trade in wildlife and timber in these two provinces. The training course was carried out by national and international experts in species identification and wildlife and timber trade in Vietnam. The methodology utilized for this training course was designed and developed by Robertson for use in wildlife and timber surveys in Quang Binh province (see Robertson 2004c for details). This methodology was taken and adapted by the authors here for the training on *F. hodginsii* survey research (see below).

During initial meetings with provincial FPDs, it was stressed that rangers chosen by the province should be relatively junior staff (of 1 – 3 years experience, in their early 20's) from the provincial centre or districts other than Van Ban or Muong La. The rationale behind these decisions being that experienced trainees would already understand many, if not most, of the issues and would be slow to change their habits; and that trainees should not come from proposed areas of study in order to maintain confidentiality.

Training units (from Robertson, 2004c)

- *An introduction to the illegal trade in Timber*

This unit aims to give the participants an understanding and appreciation of the scale and value of the international timber trade and how Vietnam fits into the global picture.

- *Illegal timber trade dynamics*

This unit introduces participants to thinking of the timber trade as a framework that will help them design investigations and focus enforcement operations. It is carried out in a participatory way allowing participants to develop their own timber trade framework with assistance from the training facilitators

- *The regulation of the timber trade in Vietnam*

This half day unit uses the frameworks already established to show participants how this framework is regulated by National legislation and international agreements (i.e. CITES). Participants use their own experiences with complicated legal situations to work through the regulation framework and help understand legislation.

- *Investigation techniques*

Participants are trained in covert investigations techniques used in [wildlife and] timber trade surveys. This includes cover stories, collecting and recording information, and managing information and an investigation. The day is focused on actually practicing what is taught in lectures through group and individual exercises.

- *Methodology development*

Participants are facilitated to identify what information they need to collect on the illegal trade in wildlife and timber by comparing what they already know and what they need to know to help improve enforcement actions. The results from this unit form the basis of their investigations. Following this they undertook two days field testing of their methodology and on their return evaluated what needs to be changed and how the methodology can be improved.

- *Information management*

A case book was developed to organise information for the illegal timber trade investigations. These case books were the central information management tool used in the ranger investigations. The case books were organised into the following sections:

- Reporting outline

This outline guides the rangers when writing their reports and preparing their presentation on the district surveyed.

- Information framework

This is a framework of the information the rangers needed to collect during their investigations. It is used as a guide when completing encounter reports and also assists in planning the next steps in an investigation.

- Daily activity log

This is a daily log of the investigation. It includes who and where the rangers were at what times.

- Encounter reports

For every encounter (meeting, conversation, observation etc) a separate encounter report is written. This is a record of what information was gathered in each encounter (e.g. meeting with a timber trader, builder etc).

- Informant lists

All informants are listed here who gave information during the survey, including contact details. The reliability of their information is recorded for future investigations

- *Investigations into the illegal trade in timber*

Four out of the twelve participants will be selected to carry out investigations into the illegal *F. hodginsii* timber trade in a district not in their province. The results from their investigations will feed into the threat assessment and be compiled to show the illegal timber trade dynamic for the surveyed areas.

Training Schedule

A brief training schedule is provided in Table 16 below.

Table 16: Training schedule

Day	Subject
1&2	Introduction to the illegal timber trade, Illegal timber trade dynamics, the regulation of the timber trade in Vietnam (including national legislation on timber issues)
3	Investigation techniques
4	Methodology development
5	Field testing methodology and investigation skills
6	Field testing methodology and investigation skills
7	Methodology evaluation and final preparation

Training team

Thomas Osborn	Timber Trade consultant
Vu Ngoc Thanh	Hanoi National University
Nguyen Phi Truyen	Legislation department, National Forest Protection Department

Trainees

All trainees were from Son La and Lao Cai district and provincial Forest Protection Departments. They ranged in age from 23-49 years old and have been working for the FPD from four months to 28 years. Only three of the trainees have not attended University (see Table 17 for details).

The average age of FPD participants from Lao Cai was 27 years old with an average of 3 ½ years experience per person (though if ignoring one person – Nguyen Van Duong – the average experience is just over 1 year). Four of the six trainees from Lao Cai work in Van Ban FPD.

The average age of FPD participants from Son La was 44 ½ years old with an average of 21 years experience per person. Only one of the six trainees from Son La works in Muong La FPD.

Table 17: Training participants

Name	Birth year	Province of birth	Duty station	Duration of working with FPD	Level of education
Tran Duc Chinh	1982	Thai Binh	Van Ban FPD	One year	Forestry vocational High School, Hanoi (3 years)
Luong Xuan Kien	1980	Yen Bai	Van Ban FPD	Four months	Forestry University (4 years)
Bui Manh Cuong	1964	Son La	Son La FPD	18 years	Agriculture and Forestry University (4 years)
Lo Van Thanh (I)	1962	Son La	Muong La FPD	15 years	Forestry vocational High School, (3 years)
Leo Van Bien	1957	Son La	Son La FPD	28 years	In service training
Le Duy Tan	1980	Lao Cai	Van Ban FPD	One year	Forestry University (4 years)
Tran Manh Thang	1980	Yen Bai	Van Ban FPD	One year	Forestry University (4 years)
Hoang Hoac	1962	Son La	Son La FPD	16 years	Forestry University (4 years)
Lo Van Thanh (II)	1962	Son La	Son La FPD	27 years	Agriculture and Forestry University (4 years)
Quang Van Binh	1956	Son La	Son La FPD	22 years	Forestry University (4 years)
Nguyen Son Binh	1979	Yen Bai	Lao Cai FPD	3 years	Forestry University (4 years)
Nguyen Van Duong	1967	Lao Cai	Lao Cai FPD	15 years	Forestry University (4 years)

Results

Evaluation of the trainees' performance for their understanding of the timber trade and their skills in investigation techniques were assessed through verbal examinations. The trainers discussed which FPD rangers they thought had the commitment, right attitude and skills to be a good investigator. The trainers decided the following two rangers from Lao Cai were rated highest in these qualities: Le Duy Tan and Nguyen Van Duong. Rangers from Son La all had a high level of experience and all proved capable during tests. The highest rated two rangers were Quang Van Binh and Lo Van Thanh (II).

Conclusions

The four trainees who performed best were theoretically chosen to conduct surveys in Lao Cai and Son La. While the two trainees from Lao Cai were available (Lao Cai FPD had clearly stated that participants chosen would be required to spend one week conducting undercover research) those from Son La were not. The reasons behind lack of availability were primarily due to most of the trainees holding a senior rank within their FPD departments. Other reasons for absence included family commitments. The result was that the two trainees who ended up conducting surveys in Van Ban were those who, it was felt by the trainers, performed least well.

Clearly the objectives were lost somewhat on the Lao Cai and Son La provincial FPDs. Son La FPD sent all experienced, older staff while Lao Cai FPD sent mostly rangers from one of the proposed areas of study. So while the training in itself appeared to be successful the underlying aims of training (i.e. all staff learning and confidentiality) were less so.

Annex 2. Table giving national legislation regarding the harvest and utilisation of *Fokienia hodginsii* in Vietnam

No	Title	Notes
I	National Assembly laws	
01	Vietnam Law on Forest Protection and Development (2004)	
02	Vietnam Trade Law (1997)	
03	Vietnam Criminal Code (1999)	
04	Vietnam Land Law (2003)	
II	National Assembly's Executive Committee law	
04	Ordinance on administrative violation charges (2002)	
III	Government legislation	
01	Decree no. 18- HĐBT dated 17/01/1992 of the Council of Ministers regulating the list of precious forest plants and animals and protection mechanism.	
02	Decree no. 48/2002/NĐ-CP dated 22/4/2002 of the Government on amendment and supplementation of the List of precious forest plant and animal species.	Amendment to Decree no. 18.
03	Decree no. 11/2002/NĐ-CP dated 22/01/2002 of the Government on management of importation and exportation and trans-border activities of wild animal and plants.	
04	Decree no. 134/2003/NĐ-CP dated 14/11/2003 of the Government regulating in details the implementation of articles of the Ordinance on administrative violation charges 2002	
05	Decree no. 77-CP dated 29/11/1996 of the Government on charge of administrative violations in the forest management, protection and forest product management.	
06	Decree no. 17/2002/NĐ-CP dated 08/02/2002 of the Government amending and supplementing some articles of the Decree no. 77-CP on charge of administrative violations in the forest management, protection and forest product management.	Amendment to Decree no. 77
07	Decree no. 139/2004/NĐ-CP dated 25/6/2004 of the Government on charge of administrative violations in the field of forest charge of administrative violations in the forest management, protection and forest product management.	Replacement of Decree no. 77 and Decree no. 17
08	Official Dispatch 3399/VPCP – NN dated Council of Ministers 2002	Correction of mistakes made in Decree no. 48
IV	Prime Ministerial legislation	
01	Decision no. 46/2001/QĐ-TTg dated 04/4/2001 of the Government's Prime Minister on commodity import and export management in 2001 – 2005.	
02	Decision no. 845 /1995/QĐ-TTg dated 22/12/1995 of the Government's Prime Minister on approval of "Action plan of biodiversity protection"	

03	Decision no. 08/2001/QĐ-TTg date 11/01/2001 of the Government's Prime Minister on issuance of management regulations for special use forest, protection forest, production forest and natural forest (enclosed with the Regulation).	
04	Decision no. 821-TTg dated 6/11/1996 of the Prime minister on <i>F. hodginsii</i> wood products' harvest and exportation.	
05	Decision no. 664-TTg dated 18/10/1995 of the Government's Prime Minister on exportation of timber and forest products.	
06	Directive no. 130/TTg dated 27/3/1993 of the Government's Prime Minister on management and protection of precious and rare animals and plants.	
07	Directive no. 286/TTg dated 05/5/1997 of the Government's Prime Minister on strengthening urgent measures for forest protection and development.	
08	Directive no. 287/TTg dated 02/5/1997 of the Government's Prime Minister on organization for examination, extermination forest destroying individuals and organizations	
09	Directive no. 12/2003/CT-TTg dated 16/5/2003 of the Prime Minister on strengthening with urgent measures for forest protection and development.	
V	Ministerial level legislation	
01	Decision no. 47/1999/QĐ-BNN-KL dated 12/3/1999 of the Ministry of Agriculture and Rural Development on transportation, production and trade of timber and forest products.	
02	Decision no. 59/2005/QĐ-BNN dated 10/10/2005 of the Minister of Agriculture and Rural Development on issuance of regulation on forest product supervision and inspection.	Replacement of Decision no. 47
03	Decision no. 02/1999/QĐ-BNN-KL dated 05/01/1999 of the Minister of Agriculture and Rural Development issuing regulation of timber and forest product harvest (enclosed with Regulation).	
04	Decision no. 04/2004/QĐ-BNN_KL dated 02/02/12004 of the Minister of Agriculture and Rural Development issuing the Regulation of timber and forest product harvest (enclosed with Regulation).	Replacement of Decision no. 02
05	Decision no. 69/2000/QĐ-BNN-KL dated 26/6/2001 of the Minister of Agriculture and Rural Development on issuance of Regulation of the management and use of tree cutting hammer and forest ranger hammer.	
06	Decision no. 01/2002/QĐ-BNN-KL dated 02/01/2002 of the Minister of Agriculture and Rural Development on amendment and supplementation of articles of Decision no. 69.	Amendment to Decision 69
07	Directive no. 18-NN-PTLN-CT dated 18/11/1996 of the Ministry of Agriculture and Rural Development on suspension of <i>F. hodginsii</i> harvests and closing all forest areas with <i>F. hodginsii</i> tree allocation.	
08	Decision no. 06-NN-PTLN-CT dated 15/02/1997 of the Ministry of Agriculture and Rural Development on strict compliance of <i>F. hodginsii</i> forest closure, suspension of <i>F. hodginsii</i> timber harvest and trade.	

09	Inter ministerial Circular of MARD – MOT – General Department of Customs no. 01-TTLB dated 22/12/1995 guiding implementation of Decision no.664 on exportation of timber and forest products.	Guidance for Decision 664
10	Inter ministerial Circular of MARD – MOT – General Department of Customs no. 06/TTLB dated 02/4/1996 guiding supplementation and amendment of issues of implementation of Interministerial Circular no. 01.	Amendment to Circular no. 1
11	Circular no. 62/2001/TT-BNN&PTNT dated 05/6/2001 of the Minister of Agriculture and Rural Development guiding import-exportation of commodity under professional management of MARD according to Decision no. 46.	Guidance for Decision 46
12	Circular no. 72/2001/TT-BNN dated 09/7/2001 of the Minister of Agriculture and Rural Development amending and supplementing Circular no. 62	Amendment to Circular no. 62
13	Interministerial Circular no. 144/2002/TTLT-BNN&PTNT-BCA-BQP dated 13/12/2002 of MARD, Ministry of Public Security, Ministry of Defense on guidance of cooperation between three forces of Forest Ranger, Police, Army in forest protection.	
14	Circular no. 13/LN/KL dated 12/10/1992 of Ministry of Forestry guiding implementation of Decree no. 18 regulating the list of precious and rare forest plants, animal and management and protection policies.	Guidance for Decree no. 18
15	Circular no. 63/2004/TT-BNN-KL dated 11/11/2004 of MARD guiding for contents of the Decree no. 139 on charges of administrative violations in forest management, protection and forest product management.	Guidance for Decree no. 139

Annex 3 Details of forested and natural areas in survey areas in Lao Cai and Son La provinces

Table 18 Forested and natural areas of communes in Sa Pa and Van Ban districts that contain *F. hodginsii* in 2004

District/Commune	Total natural area (ha)	Natural forested area (ha)
Van Ban District *	76,600.0	53,947.0
Khanh Yen Ha	6,554.0	5,103.0
Lien Phu	6,270.0	4,315.0
Duong Quy	10392.0	7,195.0
Khanh Yen Trung	4,848.0	3,533.0
Nam Tha	13,838.0	9,053.0
Nam Xay	17,409.0	11,089.0
Nam Xe	17,289.0	13,659.0
Sa Pa District *	38,750.0	23,603.0
Ta Van	6,759.0	4,946.0
Lao Chai	2,828.0	1,520.0
San Sa Ho	5,763.0	4,161.0
Ban Ho	11,439.0	6,406.0
Nam Sai	2,470.0	930.0
Nam Cang	7,068.0	4,697.0
Ta Giang Phin	2,423.0	943.0
Total of 14 communes	115,350.0	77,550.0

Source: Lao Cai FPD

* = Van Ban and Sa Pa district totals show total areas for those communes only; the figures do not represent total district area.

Van Ban district lies to the North-east of Lao Cai City. As of the end of 2004 (UBND Van Ban district, 2005b) the natural area covered by the district was 143,927.0 ha. Of this forest land constitutes 115,660.4 ha (natural forest was 81,163.7 ha, planted forest was 4,328.3 ha and unplanted (bare) land was 29,496.7 ha) with a total forest coverage of 59.4%. Forest area and forest coverage in Van Ban district was the largest of all districts in Lao Cai province. The district has 22 communes and one township. According to the same survey (UBND Van Ban district, 2005b the natural forest area that contains *F. hodginsii* was 53,947 ha allocated in seven communes (see Table 18 above).

Table 19 Forested and natural areas of communes in Thuan Chau, Moc Chau, Phu Yen, Muong La, Bac Yen and Mai Son districts that contain *F. hodginsii* in 2004

District/Commune	Total natural area (ha)	Natural forest area (ha)
Thuan Chau District*	21,255.7	11,901.8
Co Mạ	14,420.7	7,746.2
Ban Lam	6,835.0	4,155.6
Moc Chau District*	43,038.0	23,328.8
Chieng Son	9,788.0	4,689.2
Xuan Nha	33,250.0	18,639.6
Phu Yen District*	20,880.0	8,157.4
Muong Thai	6,910.0	844.9
Suoi To	13,970.0	7,312.5
Muong La District*	71,460.0	40,609.0
Nam Pam	9,615.0	4,172.7
Hua Trai	9,769.0	2,408.6
Chieng Cong	13,924.0	7,031.5
Chieng Muon	8,189.0	4,858.9
Chieng An	8,390.0	5,221.7
Ngọc chien	21,573.0	16,915.6
Bac Yen District*	39,694.0	15,895.2
Hang Chu	13,706.0	4,420.6
Xim Vang	8,127.0	3,515.2
Ta Xua	17,861.0	7,959.4
Mai Son District*	16,567.0	7,371.2
Chieng Dong	3,103.0	1,833.5
Chieng Noi	13,464.0	5,537.7
Total of 17 communes	212,894.7	107,263.5

Source: Son La FPD

* = district totals show total areas for those communes only; the figures do not represent total district area.

Muong La district lies to the North of Son La Town. As of the end of 2004 (UBND Muong La district, 2005) the natural area covered by the district was 140,790 ha. Of this forest land constitutes 115,660.4 ha (natural forest was 53,476.9 ha, planted forest was 2,150.4 ha and unplanted (bare) land was 26,834.0 ha) with a total forest coverage of 39.3%. Forest area and forest coverage in Muong La district was the largest of all districts in Son La province. The district has 16 communes and one township. Muong La district is currently receiving investment for the production of Ta Bu hydropower plant. However, according to Muong La FPD (*pers. com.*) the forest to be flooded when the dam construction is complete is low-lying and does not contain *F. hodginsii* trees. According to the same survey (UBND Van Ban district, 2005) the natural forest area that contains *F. hodginsii* was 40,609.0 ha allocated in six communes (see Table 19 above).

Annex 4. Violation types and associated penalty levels

From 2001— 2005 administrative violation charges related to illegal *F. hodginsii* activities followed three government Decrees:

1. Decree no. 77-CP dated 29/11/1996 of the Government on fines pertaining to *in-situ* forest administrative violations regarding forest management, protection and forest product management.
2. Decree no. 17/2002/NĐ-CP dated 08/02/2002 of the Government amending and supplementing some articles of Decree no. 77-CP on charges of administrative violations in the forest management, protection and forest product management.
3. Decree no. 139/2004/NĐ-CP dated 25/6/2004 of the Government on fines pertaining to *in-situ* forest administrative violations regarding forest management, protection and forest product management.

Violation charges are based upon Decree 77, amended and supplemented by decree 17; these charges were reviewed and revised in Decree 139 where new regulations were outlined. These regulations are now used to assess levels of penalty with regards *F. hodginsii* activities.

Administrative violation charges (in million VND/m³) related to *F. hodginsii* (calculated by m³ of log), following Decree no. 139/2004/NĐ-CP are given in Table 20 below:

Table 20: Violation category, timber volumes and charges related to illegal *F. hodginsii* harvest

Violation category	Limits (m ³)	Violation charge (million VND / m ³)
Illegal <i>F. hodginsii</i> harvest in production forests:	<3	1.5 - 2
	3 – <6	2 – 2.5
	6 - <10	2.5 - 3
	10+	Up to 10 years Imprisonment
Illegal <i>F. hodginsii</i> harvest in protection forests:	<2	2 - 3
	2 - <4	3 – 3.5
	4 - <7.5	3.5 - 4
	7.5+	Up to 10 years Imprisonment
Illegal <i>F. hodginsii</i> harvest in special use forests:	<1.5	3 - 4
	1.5 - <3	4 - 5
	3 - <5	5 - 6
	5+	Up to 10 years Imprisonment
Illegal trade and storage of <i>F. hodginsii</i> timber:	<3	1.5 - 2
	3 - <6	2 – 2.5
	6 - <10	2.5 - 3
	10+	Up to 10 years Imprisonment

Source: national FPD

Notes:

Administrative fines given above regarding the illegal harvesting of *F. hodginsii* are applied when harvesting occurs in breach of harvesting permit guidelines (and consequent forest damage)

Fines administered when no permit is produced can result in amounts up to 1.2 times the above figures.

Penalties regarding the illegal trade, storage of *F. hodginsii* timber will also include the confiscation of forest products, tools and the means of administrative violations. Maximum fines cannot exceed 30 million VND.

Imprisonment of up to 10 years is according to Article 175 and Article 189 of the Vietnam Criminal code.

Criminal prosecution can also result from repeat violations.

Annex 5. Table showing forest protection and development law violations from 2001 to 25/11/ 2005

No	Description	Unit	2001	2002	2003	2004	2005	Total
I	Violation	case	56,418	54,846	55,461	48,500	36,774	251,999
1	Deforestation and forest product harvest	case	12,295	11,438	9,732	8,363	3,914	45,742
2	Violations of forest fire prevention regulations	case	729	1,334	1,281	1,000	1,197	5,541
3	Hunting, transport, trade of wild animals	case	1,551	1,642	1,295	1,254	1,227	6,969
4	Transport, trade of timber and forest products	case	38,095	34,732	34,373	30,170	18,707	156,077
5	State management of timber and forest product processing	case	893	696	2,189	807	1,021	5,606
6	Other violations	case	2,855	5,004	6,591	6,906	10,708	32,064
II	Sorted into violators	case	58,476	57,457	56,462	49,620	36,774	258,789
1	State owned enterprises	case	82	117	94	103	131	527
2	Households, individual persons	case	46,543	44,635	35,976	30,448	21,514	179,116
3	Others	case	11,851	12,705	20,392	19,069	15,129	79,146
III	Total violation charged	case	40,136	40,639	43,906	35,007	29,333	189,021
1	Administrative charges	case	39,876	40,276	43,416	34,614	28,890	187,072
2	Criminal charges	case	260	363	490	393	443	1,949
IV	Confiscated vehicle, forest products							
1	Confiscated vehicle	Unit	3,649	866	1,442	2693	2,398	11,048
	- Automobiles	Unit	3,649	322	498	740	583	5,792
	- Motorcycles	Unit	n/a	544	944	1,953	1,815	5,256
2	Confiscated forest products							
	Logs	m ³	26,191.0	23,339.0	26,345.0	22,052.2	16,248.2	114,175.4
	In which: Rare, precious timber (m3)	m ³	1,635.00	992.00	1,060.00	845.00	710.2	5,242.2
	Various lumbers (m3)	m ³	25,233.0	25,866.0	24,663.0	23,862.4	16,875.7	116,500.1

	In which: Rare, precious timber (m ³)	m ³	4,314.0	4,158.0	3,616.0	3,320.7	2,382.4	17,791.1
3	<i>Confiscated wild animals</i>							
	- Calculated by Individual	con	15,570	39,509	35,690	22,239	7,221	120,229
	- Calculated by weight	kg	66,184.0	89,078.0	54,613.0	46,073.0	57,794.0	313,742.0
V	Budget transfer	Million VND						
1	Total fine, in which:	Million VND	113,475.288	130,712.875	139,553.612	153,433.611	134,086.832	671,262.218
	- Fine in cash	Million VND	48,291.643	54,965.982	54,638.862	57,168.926	55,936.719	271,002.132
	- Sell of vehicle, forest product	Million VND	64,491.754	74,931.874	83,356.799	95,698.066	76,659.196	395,137.689
	- Tax re-collection	Million VND	462.914	495.515	1,188.776	314.225	343.586	2,805.016
	- Other collections	Million VND	228.977	319.504	369.175	252.394	1,147.331	2,317.381
2	Total transferred to budget	Million VND	91,675.857	96,076.555	111,940.395	126,547.668	101,172.178	527,412.653

Source: national Forest Protection Department

Annex 6: Natural and socio-economic conditions of Nam Xay commune (Van Ban district) and Ngoc Chien commune (Muong La district)

Nam Xay Commune, Van Ban district

Location

Geographic location of the commune:

- Adjacent to Minh Luong district to the North
- Adjacent to Mu Cang Chai district of Yen Bai province to the East
- Bordering with Than Uyen district of Lai Chau province to the South West.

Topography

Nam Xay is a highland commune of Van Ban district, Lao Cai province. The commune is located 35 km west of Van Ban district centre. Topography is varied and ranges from high, steep hills and mountains with deep valleys and poor access, to rolling grass hills. The dry season climate varies from cool in the winter to hot and sunny in the summer, with dry westerly winds; such a climate makes forest protection and fire prevention extremely difficult. The wet season often features high rainfall which can cause sweeping floods; these in turn cause landslides which can damage irrigation works, roads and farmers' fields and homes.

Land use

According to land statistical data of 2005, Nam Xay commune has a total natural land area of 17,087 ha, of which:

- Forested land accounts for 13,688.5 ha, or 80.10%; of this production land covers 744.7 ha, or 4.35%, and protection land is 12,943.8 ha, or 75.75%;
- Agricultural production land covers 450.34 ha, or 2.64%;
- Fruit tree plantation covers 432.34 ha, or 2.53%;
- Rice cultivation land covers 92 ha, or 0.42%
- Pasture and grazing land covers 300 ha, or 1.76%
- Other annual and perennial tree land covers 58.34 ha, or 0.35%

Population and poverty

According to official data Nam Xay commune has three villages with a total of 120 households and 265 labourers. The commune ethnicity is made up of H'mong (70 households), Dao (44 households) and Tay (6 households) (Van Ban office of statistics, 2004).

However, according to the latest report "Preliminary summary of implementation of the economic, cultural and social development tasks in the first 6 months of 2005" (Nam Xay People's Committee, June 2005), there are 131 households comprising 825 people in the commune, including 295 labourers (or 35% of the population). Approximately 19% of households are considered poor (i.e. with an average income of <200,000 VND per household per month) (Nam Xay People's Committee, June 2005).

There are three main villages in the commune: Tu Thuong, Tu Hạ, and Ta Nang. Tu Thuong village is the most remote lying approximately 4 km from the communal centre in an area of sloping hills; the main ethnic group is H'mong (Blue H'mong). In the past road access to the village was poor, via a dirt road, though recently has been improved through the World Bank-funded Road Renovation Project. Tu Hạ village is also the communal centre; ethnicity is comprised of all three ethnic groups i.e. H'mong, Dao and

Tay, together with two Kinh households and one Kinh teacher. Ta Nang village has two major hamlets: Ta Nang hamlet and Nam Xi Tan hamlet. Ta Nang hamlet contains over 30 households approximately 1-1.5 km from the communal centre, and whose main ethnic group is Red Dao. Nam Xi Tan hamlet is located 12 km from the communal centre, near a national road leading towards Than Yen district; the main ethnic groups here are the H'mong and Dao.

Education and literacy

The commune has only 1 primary cum secondary school. The total number of pupils attending school in 2005 is 215, of which primary pupils are 126 and secondary pupils are 89.

The higher secondary pupils must attend in neighboring Minh Luong commune or at the boarding school in the district town; however, the journey is far and not all families can afford associated costs (transport, food etc). Tu Thuong hamlet, although allocated with capital for infrastructure construction (construction of a primary school), currently only has one degraded school with 4 teachers (2 male and 2 female teachers). Of these two are a couple and own a temporary house in the communal center. The two other teachers are living in the hamlet together with about 30 households, and have little opportunity to improve their teaching resources.

Many primary school pupils leave school at an early age often to help provide incomes for their families. Although the communal authority and especially the school have attempted to introduce measures for encouraging school attendance the drop out rate is still high.

Adult literacy also is very low with the majority of adults in Nam Xi Tan hamlet (including the hamlet head) being illiterate. The building here used for teaching consists of an empty thatch house lacking tables, chairs and blackboard.

Healthcare

Nam Xay commune has one health station. Under Programme 139 all commune residents have received free medications. The proportion of fully vaccinated children is 42%, and the percentage of malnutrition in children under age 5 is 4.3%.

Economic activities

Several small, local industries have developed in the commune in recent years. These include tofu (soya curd) production, a grain milling service and a small manufacturing shop making hand tools for agro-forestry production activities.

Transportation

There has recently been developed one main, gravel-based intervillage road connecting the commune centre to Tu Thuong village (funded through a World Bank loan). This road is now under the jurisdiction of the commune PC but to date no facility is in place to ensure continued road quality. Other roads are small and soil-based.

Irrigation

The commune has one irrigation scheme named Y To located in Ta Nang village. The scheme is currently under repair.

Electricity

Only the commune centre, and Tu Ha village, has access to the national grid. Other villages rely on small, household hydroelectric generators for electricity.

Ngoc Chien Commune, Muong La district

Location

Ngoc Chien commune of Muong La district, Son La province is borders Van Chan district and Mu Cang Chai district of Yen Bai province to the north.

Land use

Natural area of the commune is 21,573 ha, including agricultural land of 1,160.15 ha, forestry land with forest is 9,789.35 ha, and special use land of 61.94 ha.

Population and poverty

According to commune PC data (2004) the population consists of 7,770 persons comprised of 3,817 men and 4,075 women. The total number of households as of 30/02/2005 is 1,331 with 2,410 persons in the labor age range. Ethnic groups comprise La Ha, H'mong, Thai (Black Thai and White Thai) and a very small number of Dao. Two hundred and ninety-nine households (or 22.4%) live below the poverty line (income of <200,000 VND per month).

Infrastructure

Roads in Ngoc Chien commune are of poor quality. At present, to serve the construction activities of the Son La hydroelectric plant, the road from Son La Town to the centre of Muong La district has been enlarged and paved with asphalt. One section of the road from the centre of Muong La district to Ngoc Chien commune has been also upgraded and asphalted, but the rest of the road is still a soil-based road. Transportation is by bicycle or motorbike with access only possible to larger vehicles with 4-wheel drive. Recently road access has been granted to many remote households under the government's 135 Programme on infrastructure development.

Electricity

Almost all areas in Ngoc Chien commune have access to electricity from the national grid.

Economic activities

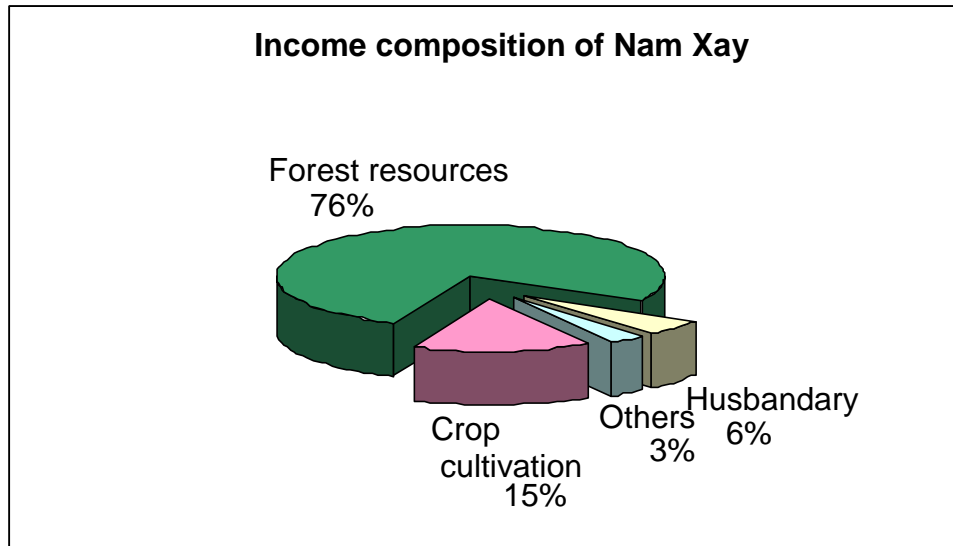
Typical professions of local people include motorbike repair shops, motorbike taxi, small-scale trade business, and flower planting for a flower farm.

Household economic activities

Nam Xay commune

Nam Xay commune contains a large forested area and in recent years the 'forest economy' has played an important role in the income structure of the households. In the past crops provided a major part of the income but this has decreased since the exploitation of Cardamom, *Amomum aromaticum*. However, crop production still plays an important role in ensuring food security and well has providing household income. According to the household income distribution survey results taken during this survey (see Figure 16) the majority of household income is derived from forestry and associated activities (76%) followed by crop cultivation (15%).

Figure 16: Income composition in Nam Xay commune



Source: Nam Xay People's Committee

Crop cultivation

Total commune productivity in the first six months of 2005 reached only approx. 5.6% of the communal plan (19.6 tons of the planned 353 tons) due to lean crops, natural disasters and due to the absence of statistical result from the previous harvest season. Some crops were performing well (maize production approx. 75% of the communal plan with 55 tons of the planned 75 tons. Cassava, soybean and other minor crops were also doing well).

Husbandry

At the time of the survey, the commune officially had 283 buffalo, 160 oxen, 450 heads of pig, and approx. 2,000 heads of poultry.

Over recent years husbandry has been developing and increasing, especially with regards pig, chicken and duck breeding but livestock is still generally used mainly for subsistence use and local festivals. As such commercial use of this livestock is restricted to sale only when cash is needed (e.g. for house construction).

Forest resources

The total forested area of the commune is 13,688.5 ha, accounting for 80.1% of the total natural area of the commune; production forest area is 744.7 ha (4.35%) and protection forest area is 12,943.8 ha (75.75%) of total natural land area. Income from forest resources in the commune is mainly from the harvest of *Amomum aromaticum*, with a few households collecting wild honey from the forest²⁴. Other forest products are collected for local use and consumption. Information on income from the timber trade is unclear as many associated activities illegal.

²⁴ One household in Nam Xi Tan is collect more than 100 litres of bee honey annually, with an average sale price of 70,000 VND/litre.

***Amomum aromaticum* (Cardamom)**

Cardamom production (for export of dried fruits/seeds to China) is currently increasing in Nam Xay commune and neighbouring areas due to low average annual input and high return. Harvests are taken annually after the plant is 4 – 6 years old. Plants often produce approx. 50 clusters of nuts, the dry weight of which can be approx. 8 – 12 kg. Current prices for the dried fruit are 70 – 90,000 VND/kg with prices occasionally reaching 120,000 VND/kg. Many households in Nam Xay currently cultivate over 1,000 plants producing annual incomes of hundreds of millions of VND/year.

However, cardamom cultivation may have some negative impacts on forest biodiversity, especially through understory deforestation combined with poor crop planning (Buckingham and Tu Minh Tiep, 2003). Issues regarding the drying of the fruits have also been under some scrutiny due to large requirement for firewood and the threat of forest fire (from both drying and clearing).

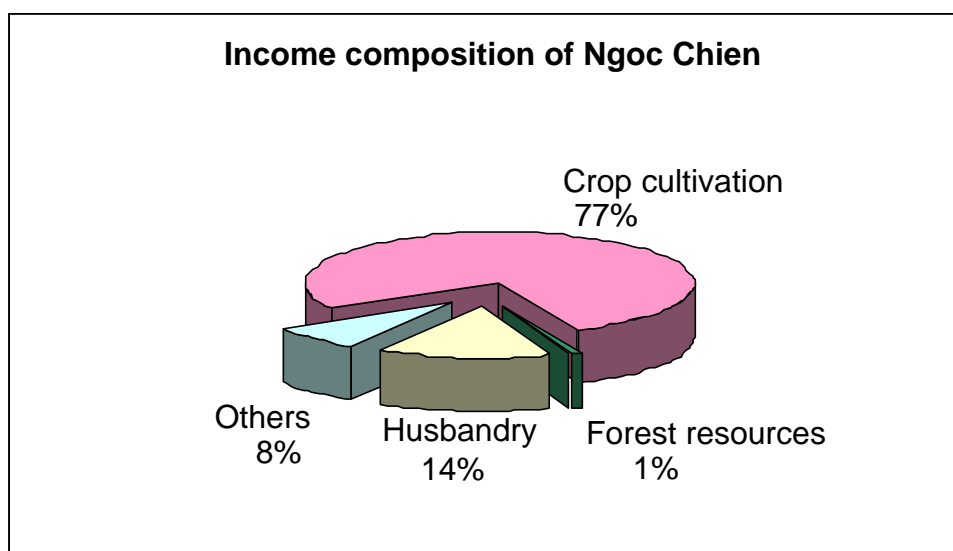
Other sources of income

Some of the more common minor sources of income in Nam Xay commune include wine distillation, small commercial trades, grain milling, tofu making, hand-made paper and motorbike taxi driving.

Ngoc Chien commune

Economic activities of Ngoc Chien commune include crop cultivation, husbandry, forestry and others. Figure 17 shows the household income composition for Ngoc Chien commune. Crop cultivation provides the highest amount of income (approx. 77%) followed by husbandry (14%). Income derived from forestry-related activities constitutes only approx. 1% of the total communal income.

Figure 17: Income composition of Ngoc Chien commune



Source: Ngoc Chien People's Committee

Crop cultivation

Due to the majority of the population in Ngoc Chien commune being of the Thai ethnic group, the traditional practice of wet rice production constitutes a significant role in crop cultivation. Rice in general here is an important part of food security and household income generation. Within the commune autumn rice is cultivated on 343 ha with an average yield of approx. 4.6 tons/ha; spring rice is cultivated on 148 ha with an average yield of approx. 4.5 tons/ha. Upland rice cultivation is also still practiced by some Thai households on an area of 140 ha with an average yield of approx. 1.6 tons/ha (all data provided by Ngoc Chien PC). Although upland rice cultivation is dissuaded by the authorities (due to negative impacts on forested areas) and is of low yield, families still cultivate it due to its high quality and high market price.

Maize is also cultivated as a main crop during the spring and summer seasons. In 2004 160 ha of maize was cultivated with an average yield of approx. 3.4 tons/ha. Maize is cultivated as an upland crop and the grain harvested is sold mainly for livestock feed.

Besides rice and maize several other minor crops were also cultivated: 136 ha of cassava giving an average yield of approx. 9.8 tons/ha; 70 ha of potato with an average yield of approx. 15 tons/ha; 52 ha of green vegetables with an average of approx. 16 tons/ha; 29 ha of mung bean with an average yield of approx. of 0.6 ton/ha; and 190 ha of summer/autumn soybean with an average yield of approx. 0.9 ton/ha.

Husbandry

At the time of this survey, official data showed that there were 1,346 heads of buffalo, 1,254 heads of ox, 180 heads of horse, 1,090 heads of goat, 3,650 pigs and 28,888 poultry. Total aquatic culture area is 18 ha. The number of beehives was officially 50. Husbandry outputs are enough to meet commune requirements only; no husbandry products are sold commercially outside of the commune.

Forest resources

The total forested land area of the commune is 9,789.35 ha, of which natural forest accounts for 9,571.5 ha; the remainder (182 ha) is plantation forest developed under Programme 661. Income from forest resources in the commune is accounts for only 1% and this income is made up from forest protection and timber processing contracts.

Other sources of income

Some of the more common minor sources of income in Ngoc Chien commune include wine distillation, small commercial trades, grain milling, manual labour, cattle fertilizer sale (to a local commune-owned flower farm) and motorbike taxi driving.

Annex 7. Actions to be taken as outlined in the National Action Plan on wildlife trade control²⁵

- Action 1: Strengthen the awareness and understanding of the roles and responsibilities of decision-makers and law enforcement officers in the implementation of the Action Plan, laws and other policies on wildlife conservation and wildlife trade control.

- Action 2: Raise awareness among traders, producers and consumers of the major role of wildlife in balancing ecosystems for humans, and on the impacts of the unsustainable wildlife trade and inappropriate uses of wildlife; striving toward a sustainable use of wildlife in human societies.

- Action 3: Strengthen information, education and communication concerning biodiversity conservation and wildlife trade controls to communities, particularly those living in the buffer and core zones of protected areas.

- Action 4: Raise awareness and understanding among school children of the importance of conserving biodiversity, and the negative impacts of the illegal wildlife trade and the unsustainable use of wildlife.

- Action 5: Update, revise and when necessary, develop legal documents on management, protection and sustainable use of wildlife resources.

- Action 6: Improve the legislative framework to facilitate cooperation and coordination between relevant law enforcement agencies implementing wildlife trade controls.

- Action 7: Increase understanding and knowledge on laws, and strengthen the skills on implementation of wildlife trade controls, by relevant law enforcement agencies.

- Action 8: Improve the organizational structure and strengthen the capacities of Viet Nam's CITES Management Authority and Scientific Authority.

- Action 9: Strengthen the capacity and enhance the effectiveness of relevant wildlife conservation personnel to rescue and release wild species back into their natural habitat.

- Action 10: Research and develop technical procedures to identify and determine the origins of wildlife in trade, and to rescue and release confiscated wild species back into their natural habitat.

- Action 11: Review the potential impacts of captive breeding and artificial propagation, and conduct experimental captive breeding and artificial propagation of

²⁵ Decision 1021/2004/QĐ-TTg dated 27/09/04 on approving an *Action Plan to strengthen the control of trade in wild fauna and flora to 2010*.

selected wild species, in order to recommend sound models for application, and standard operational guidelines for these models.

- Action 12: Research and promote artificial alternatives to endangered species used in traditional medicines and other consumptive practices in order that wildlife resources are developed and used sustainably.

- Action 13: Review the status of, and develop solutions for, the management of markets for wildlife.

- Action 14: Develop and implement captive breeding and artificial propagation programmes in order to generate more income for farmers, thereby contributing to the alleviation of poverty, and biodiversity conservation.

- Action 15: Strengthen international cooperation among relevant international organizations and CITES Parties, setting priorities for cooperation with neighbouring and ASEAN countries on wildlife trade controls.

Annex 8. Current status of knowledge regarding *F. hodginsii* standing volume and ecology of *F. hodginsii* (taken from Osborn 2004)

Volume

Virtually nothing is known (or more accurately published) on the standing, or also cut, volume of *Fokienia* in any of Vietnam, Laos or China. Many secondary sources (e.g. Nguyen Nghia Thin *pers. com.*, Tran Dinh Nghia *pers. com.*) suggest that the species is becoming scarcer throughout its range though there is no quantitative data. There is also no qualitative data on the age of trees or density of trees in any areas. It is, however, likely that some data exists with various local forest management authorities (in Vietnam) such as provincial and district Forest Protection Departments (FPD), State Forest Enterprises (SFE), local Department of Agriculture and Rural Development (DARD) offices, etc and also possibly in forest research institutes such as the Forest Inventory and Planning Institute (FIPI), Hanoi and Xuan Mai Forestry College in Hoa Binh province, northern Vietnam, though none has become apparent to date. However, data might be old, invented or just inaccurate. The gathering of available information and verification through remote sensing and ground truthing appears to be the most accurate method of assessing standing volume. Remote sensing can be used to identify forest types. Using this technology, in conjunction with information regarding *Fokienia* distribution (altitudinal ranges, soil type preferences etc) will enable researchers to map potential areas of *Fokienia* occurrence. However, actual verification must be necessitated through ground truthing. This method has the advantage of showing areas of potential interest that might be too remote for current exploitation or research by local authorities.

Further work – there are a number of remote sensing techniques (satellite image types) currently available but the most widely used imagery used for mapping vegetation types is Landsat (Mai Ky Vinh *pers. com.*). Rey-Benayas & Pope (1995) have successfully mapped landscape diversity in Guatemala using Landsat TM imagery and provide good analysis on the use of this imagery.

It is possible to predict occurrence throughout the country based on distributional data already available (e.g. FIPI 1996, Anon 1996 and unpublished edition) and it would therefore only be necessary to interpret satellite image areas within the altitudinal variation. The process would involve initially a test area in order to 'calibrate' or standardise the information. There are four areas in northern Vietnam where this could be accomplished: Van Ban and Sa Pa (Lao Cai province), Che Tao (Yen Bai province) and Muong La (Son La province). Ground truthing would also be required in order to compare real coordinates with the satellite image (and ecological research should also initially be undertaken in these areas). Once this is done it would be relatively straightforward to expand the remote sensing application to the rest of the country. The drawback is that while it is easy to find coniferous forest on the map, searching specifically for *Fokienia* might be too difficult (though this should not be a major problem when combining range information and satellite imagery). The image resolution often used is down to 30m x 30m (Mai Ky Vinh *pers. com.*, Rey-Benayas & Pope (1995) which will provide workable resolution of down to a few hectares. Working at this resolution could take approximately three months to survey the country. There is, however, one more layer of detail down to 15m x 15m which will provide a workable resolution of a few hundred metres. So it would be sufficient for stands of a certain size (assuming at this stage the focus is just on coniferous forest in general). This level of detail is likely to take

approximately six months (Mai Ky Vinh *pers. com*). Annex 4 shows a map of Vietnam overlaid with satellite image boundaries. The cost is USD 50 per map for 'old' or 'used' data i.e. from 2001 or earlier. Most recent data (2003 at time of writing) costs USD 600 per map²⁶. For research on lowland/flat areas new maps would be required because land use changes quickly e.g. planting coffee, tea etc. In the mountainous areas rate of change is slower so it is possible that the used maps would be sufficient. Nevertheless, there are two reasons why the most up-to-date maps would be better: firstly because even within two or three years the forest landscape has the potential to change dramatically (small populations can disappear entirely); and secondly because the remote sensing analysis is also likely to be prolonged further increasing the chances of error through landscape change.

Ground truthing is a long, time consuming process than will necessitate a team of researchers to visit *Fokienia* forest and take measurements. It is possible that ground truthing in the 'pilot' sites could take up to three months, and all surveying should be conducted during the dry season for safety reasons. To facilitate the process, results from the remote sensing research should be discussed with local authorities, particularly those authorities with the responsibility for the management for *Fokienia* forest areas (e.g. FPD, SFE authorities). Suitable sites can then be prioritised and the research conducted more efficiently. Discussion with local and provincial authorities, e.g. DARD regarding quotas and harvesting processes should occur concomitantly. Specifically for the 'pilot' sites, ecological research can also be conducted concomitantly (see below).

Ecology

Information on the ecology of the species is scanty though many works reference the scientific discipline. However, these publications provide only 5 or 6 lines of text and almost all publications repeat the information. The assertion by Aljos Farjon (2002) in his report 'Threatened Conifers of Vietnam' produced for FFI that little is known on the ecology of *Fokienia* is accurate and specific studies on regeneration and ecology needs to be done (see Annex 2). The added assertion in his report that regeneration may require large disturbance events also appears corroborated by the what limited ecological information is available (e.g. Kuznetsov (2001), Nguyen Duc To Luu & Thomas (2004), Than Van Canh (2002) and Annex 1) though there is also evidence to suggest that *Fokienia* seedlings may be able to regenerate in smaller forest gaps, including on old fallen trees (Kuznetsov 2001). Some examples of conifer species from the southern hemisphere requiring similar conditions can be found in Enright & Hill (1995). This being the case, management of the species *in-situ* could focus on large open areas for mass regeneration given the presence of suitable numbers of seed-bearing trees. Current techniques used in forestry employ the thinning of stands in order to encourage the recruitment of favoured timber species (Neal Enright *pers. com.*) and this approach may also prove appropriate. However, different conifer species often require different types of disturbance and research will have to be conducted to discover the best method for *Fokienia*. To date no specific *in-situ* studies on *Fokienia* have yet been implemented to confirm the hypothesis, though Kuznetsov (2001) provides interesting and useful background data on *Fokienia* ecology in Vu Quang nature reserve, Ha Tinh province, North-central Vietnam.

²⁶ For further information visit the Tropical Rain Forest Information Center (TRFIC) at <http://www.globalchange.msu.edu/trfic/>

Some information on ecology has been derived from research conducted by the Non-Timber Forest Products Research Centre (NTFPRC) (Than Van Canh 2002), a part of the Forest Science Institute of Vietnam (FSIV) – see Annex 1. The FSIV has developed a plantation in Lam Dong province that holds 1000 *Fokienia* seedlings in an effort to implement the conservation of genetic resources through seed production (Nguyen Hoang Nghia 2000). Research conducted here and elsewhere (Sa Pa) shows that information on the propagation and active cultivation of the species is available (including information on seed storage, seed collection, land preparation and planting technique) and that high success rates of seedling establishment can be achieved *ex-situ* (seedlings planted in Lam Dong in 1997 are now approximately six metres high – Nguyen Hoang Nghia *pers. com.*). Results also show that seedling success is higher in the open areas selected than in shaded areas, though other factors such as soil fertility are not reported as a consideration. Nevertheless, regardless of experimental validity, progress into ecological research is being made. A number of publications have been produced by the NTFPRC by the same (occasionally with other) authors though the vast majority of the information is repeated. Reports by the NTFPRC on research conducted in both northern and southern Vietnam show variation in the species ecological patterns such as phenology (see Annex 1). *Fokienia* stands in Ky Son district, Nghe An province, north-central Vietnam and Van Ban district, Lao Cai province are currently registered as seed sources for forest plantation (Nguyen Duc To Luu *pers. com.*)

Other information regarding the ecology of *Fokienia* is limited. Distributional information for the species is best known from Vietnam – see Annex 5 - (provincial and some districts are known) followed by China (provinces and parts of provinces e.g. South Yunnan) and poorest in Laos (e.g. northern Laos). However, distribution in Vietnam is fairly predictive through altitudinal limits (900 – 2400 m) (Anon unpublished) though somewhat more difficult in China (100 – 1800 m) (Flora of China online). Altitudinal variation is likely due to reasons of latitudinal variation and topography as well as differential harvesting pressure in Vietnam and China.

There are no reports of specific plant associations for *Fokienia* though the species is listed as occurring with other conifer species such as *Dacrydium pierrei* and *Pinus dalatensis* and has broad familial associations with angiosperms (e.g. FIPI 1996). Kuznetsov (2001) also provides a description of ‘*Fokienia* forest’ found in Vu Quang nature reserve, Ha Tinh province, North-central Vietnam.

Further work – a number of avenues for ecological research should be approached:

1. Research should be conducted into the ecology and regeneration, including pollination and seed dispersal mechanisms, in exploited and unexploited forest (as suggested by Farjon 2002). Pilot sites should be established (see ‘further work’ for Volume, above) and ecological research conducted concomitantly with remote sensing research. A key text outlining potential research methodologies for the ecology of *Fokienia* is that of Enright & Hill (1995). Specific methodological techniques are, however, not given in this book and the acquisition of relevant papers and texts referred to therein should be made. Research should include life-history traits (including longevity and growth rates), regeneration strategies (including size-class and age-class distribution measurements), nutrient-use efficiency (particularly nitrogen and phosphorous) and additive basal areas (in the assessment of competition with other forest taxa). Considering *Fokienia* appears to grow on at least two soil types (e.g.

limestone and sandstone/granite – Anon unpublished) research of ecological characteristics should be conducted in different areas that reflect such edaphic and environmental factors. Such areas could include those listed above (under 'Volume') though should also include a limestone area where presence of this species is confirmed, such as Cao Bang province, North Vietnam. Comparisons between *Fokienia* specimens growing in these different areas will provide a clearer picture of the overall ecology of the species and include site-specific ecological characteristics which would provide insights into the possible existence of *Fokienia* ecotypes.

2. A thorough review of current available information must be undertaken as there appears to be some (at least minor) discrepancies between information sources (e.g. between Kuznetsov 2001 and Thanh Van Canh 2002).

Annex 9. Distribution of *Fokienia hodginsii* in Vietnam
(map taken from Nguyen Duc To Luu and Thomas (2004))

