When Rapid Changes in Environmental, Social and Economic Conditions Converge:

Challenges to Sustainable Livelihoods in Dak Lak, Vietnam

Eva Lindskog, Kirstin Dow, Göran Nilsson Axberg, Fiona Miller and Alan Hancock

SEI STOCKHOLM ENVIRONMENT INSTITUTE

When Rapid Changes in Environmental, Social and Economic Conditions Converge:

Challenges to Sustainable Livelihoods in Dak Lak, Vietnam

Eva Lindskog, Kirstin Dow, Göran Nilsson Axberg, Fiona Miller, Alan Hancock

May 2005

In collaboration with the Institute of Tropical Biology, Ho Chi Minh City and the Tay Nguyen University, Buon Ma Thuot, Vietnam

SEI STOCKHOLM ENVIRONMENT INSTITUTE

Stockholm Environment Institute
Lilla Nygatan 1
Box 2142
SE-103 14 Stockholm
Tel: +46 8 412 1400
Fax: +46 8 723 0348
E-mail: postmaster@sei.se
Web: www.sei.se

Communications Director: Arno Rosemarin
Publications Manager: Erik Willis
Layout: Lisetta Tripodi
Web Access: Howard Cambridge
Cover photograph: Eva Lindskog

ISBN 91 975238 3 6

Contents

Boxes

Figures

Tables

Executive Summary

Vulnerability analysis tends to focus on single stresses, such as droughts or floods. Little attention has been given to date to communities' vulnerability to multiple stressors. This report documents and analyses a multi-stressor situation in Dak Lak Province in the Central Highlands of Vietnam. Our aims were to find ways of building sustainability and resilience into development strategies and support mechanisms for local sustainable natural resource use. The research was designed to:

- improve method(s) for analysing multi-stressor situations at the local and provincial level
- identify sensitivities and resilience of land use systems and income levels
- develop strategies to provide safety nets for households to help them cope with unfavourable situations

The study was a multi-stressor analysis at the local level, taking into account other scales (global, national, provincial) and their local effect. We looked at three main stressors:

1. migration
2. increased commodity production influenced by global market conditions, in this case coffee production
3. biophysical variability caused by droughts, floods and land use changes

To assess these we used local case studies in several villages with different land use orientations, coupled with a study of relevant national and province level policies. Our research was guided by a conceptual framework developed by the Stockholm Environment Institute/Clark University which considers that stresses interact with exposed natural/social systems to influence the level of social resilience (coping, adjustments and adaptation).

The social and ecological systems of Dak Lak Province are being affected by a number of changes and stressors, including planned and spontaneous in-migration from other parts of Vietnam; deforestation for coffee production and other land use changes; changed forest and land management policies; a decrease in the world market price for coffee; and climatic variability, including drought and floods. We explored how household sustainability, vulnerability and coping strategies are affected by such processes, and how sustainability can be improved and vulnerability reduced. We also looked at some of the policy responses to adjust to and cope with the changing social, economic and biophysical situation.

Dak Lak lies within one of the environmental hotspots identified in the Strategic Environmental Framework for the Greater Mekong Sub-region (SEI, 2002). It is a culturally diverse province, comprising people of about 40 different ethnic origins. There is a variety of land use and livelihood situations, ranging from mixed land uses with shifting cultivation agriculture, rainfed and irrigated paddy and animal husbandry, to coffee and other plantations for cash cropping.

Like other environmental management challenges, sustainable development requires an adaptive management approach to learning and responding to uncertainties and emerging challenges. In Dak Lak, much of the impetus for adaptive management comes from the interactions between climate variability, new agricultural opportunities and population growth from in-migration. Although each of the three districts/communes we studied experienced something of the stresses and opportunities posed by the rapid investment in coffee, vulnerability at the commune and village level differed significantly. While the dramatic nature of the rise and fall of coffee fortunes and, by association, of those directly involved in growing coffee, has captured much of the popular attention, there are considerable local differences in the degree of exposure experienced, the sensitivity to the stresses, and the resilience of livelihoods involved.

We argue that whilst Doi Moi (Vietnam's transition from a state-led planned economy to a more market oriented one) has increased opportunities for households to improve their livelihoods, it has also exposed communities to new risks associated with the market economy and international commodity price fluctuations. Concurrently, serious environmental impacts, from floods and droughts in particular, are perceived to be increasing in frequency. The role of households, local institutions and the market in regulating access to and use of natural resources has also been rapidly redefined. This has meant that communities face increasingly unpredictable environmental and economic futures. We suggest that development in Vietnam will lose momentum if current environmental and social stresses are not addressed in a sustainable way.

The study discusses key changes accompanying Doi Moi which have contributed to new patterns of vulnerability. The main change has been the evolving role of local institutions and the increasingly interconnected economies within which households are embedded. We argue that the pace of change has meant that traditional coping mechanisms are now no longer as effective, yet new mechanisms are still to evolve. Farmers, in particular, find themselves at the mercy of international commodity markets and resource management decision-making operating at scales beyond their scope of influence. Further research is needed to improve the understanding and implications for policy making of the coping, recovery and adaptation of different social and cultural groups and the institutions at different levels to rapid changes in environmental and economic conditions in the rural areas of Vietnam.

Acknowledgements

Major contributions in the field studies were made by Diep Dinh Phong from the Institute of Tropical Biology, Ho Chi Minh City, Vietnam, Pham The Hue, Nguyen Duc Dinh, and Nguyen Tan Vui, Tay Nguyen University, Buon Ma Thuot, Vietnam.

Two external reviewers made particularly helpful contributions, Alexandra Winkels, University of East Anglia and Thomas Sikor, Humboldt University, Berlin.

Enormous effort was made to render as accurate a picture of events and processes as possible; what errors and omissions remain are entirely those of the authors.

List of abbreviations and acronyms

ADB	Asian Development Bank
CPLAR	(Vietnam-Sweden) Cooperation Programme on Land Administration Reform
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
DARD	Department of Agriculture and Rural Development (province level)
DONRE	Department of Nature Resources and Environment (province level)
FCSP	Fixed Cultivation and Sedentarisation Programme
GDI	Gender Development Index
GDP	Gross Domestic Product
GNP	Gross National Product
GOV	Government of Vietnam
GSO	General Statistical Office
HDI	Human Development Index
HDR	Human Development Report
HEPR	Hunger Eradication and Poverty Reduction Programme
ICARD	International Centre for Agriculture and Rural Development (at MARD)
ICA	International Coffee Agreement
ICO	International Coffee Organization
IMF	International Monetary Fund
LUC	Land Use Certificate
MARD	Ministry of Agriculture and Rural Development
MOLISA	Ministry of Labour, Invalids and Social Affairs
MONRE	Ministry of Nature Resources and Environment
MPI	Ministry of Planning and Investment
NTFP	Non-timber forest products
NEZ	New Economic Zones
PCDL	People's Committee Dak Lak province
PRA	Participatory Rural Appraisal
PTF	Poverty Task Force
SEI	Stockholm Environment Institute
SFE	State Forest Enterprise
UNDP	United Nations Development Fund
UNEP	United Nations Environment Programme
VHLSS	Vietnam Household Living Standard Survey
VLSS	Vietnam Living Standard Survey
WB	World Bank
USD/VND	(Vietnamese Dong) exchange rate at the time of the field study: USD 1 = VND 15.500

Glossary – Vietnamese and local terms

Ban lua non	*Selling unripe rice.* Used to illustrate a situation where poor farmers are obliged to sell the rice from their rice fields before it is ripe. The situation makes them dependant on middle-men who purchase the rice and who often also are suppliers of fertilisers and other rice inputs.
Buon (or ban)	*Village*, as in Buon Dak Ju literally meaning Dak Ju village. In this report the full term is used: Buon Dak Ju.
Chu	*Master or head of*. Often used to illustrate one person's or a collective's management or ownership of an asset (as land) or an activity (*lam chu*).
Commune, district, province, city	Locally, Vietnam is governed by elected People's Councils and their representatives, People's Committees, at each of the three administrative levels: commune, district, province and city. To date (2005), there are 64 provinces and cities. Each province and city includes from about 5–20 districts (or wards in the inner cities) and each district includes on average 10–20 communes. A commune consists of villages that have different names locally: *lang, thon, ap, ban* (*phuong* in the cities). The village unit has yet another sub-group, *to*.
Doi Moi	*New change* or *renovation.* A concept to describe the economic reform policy of the Government of Vietnam (GOV) that was formally decided upon in 1986.
Forest land, forested land, land with forest cover	The term "dat rung" (meaning land-forest) is somewhat ambiguous in Vietnamese language. It could mean: · forest land = land that once had forest cover and is meant to be re-planted; · forested land = land that has been planted with forest; · land with forest cover = land that is currently covered by forest (natural and/or planted)
Gui	*Basket* carried on the back; used as a weight measurement.
Kha, trung binh, ngheo	Literally, *better-off, average*, and *poor*. Common designations in Vietnam for classifying standard of living. See also *poverty line*.
Khai hoang	Literally, *opening up*. Often used to illustrate the action of clearing land for agricultural cultivation.
Kinh	The term is used to designate the ethnicity of the majority population in Vietnam.
Model	The use of the term 'model' (similar to pilot, example, trial, experiment) refers to the Vietnamese expression *mo hinh*. The term is used by the local authorities when introducing new technologies or species in agricultural and forestry production. The models are often implemented by farmers considered to have sufficient capacity to take the risks. Other farmers are then expected to follow.
Shifting or swidden cultivation	In this paper, the two terms are used without distinction. They are put in one category to illustrate agricultural techniques mainly used in the uplands and the mountainous areas in Vietnam and different from varied irrigation techniques used in the lowlands.
Sao	Measurement of land corresponding to 1,000 square meters.
Thon	Literally meaning *village* as in Thon 6 or Thon 7, *Village* 6 and *Village* 7. In this report, the full term is used: Thon 6.
Vung sau, vung xa	*Areas deep* (impassable), *areas far-away.*
Xam canh	Literally, *land encroaching*, used to illustrate a situation where the actual land manager/ owner is not living or registered in the commune where their land is situated.

1 Introduction

Change is often the norm for many societies but when the pace of change outstrips the adaptive capacity of local institutions, and/or multiple changes occur simultaneously, vulnerability becomes starkly apparent. Many countries have experienced unprecedented social, cultural, economic and environmental change from a combination of national and international processes. But few countries have experienced as rapid a change as Vietnam since the end of the war in 1975. Political, demographic, technological, economic, social, cultural and environmental changes have dramatically transformed Vietnamese society.

The process of transition, known as *Doi Moi*, from a state-led planned economy to a more market oriented one, has affected people in different ways, with some better placed to take advantage of new opportunities than others. However, we suggest that development in Vietnam will lose momentum if current environmental and social stresses are not addressed in a sustainable way.[1] This study explores vulnerability to a combination of multiple environmental and economic risks in one province of the Central Highlands, Dak Lak.[2]

2 Vietnam: 20 years of 'catching up'

Vietnam is a diverse and dynamic, yet vulnerable, country (Box 1). It has experienced considerable social[3] and economic change in recent decades. Whilst it has recorded a marked reduction in poverty, the country has also been counting the increasing economic and social costs of natural disasters, environmental degradation and economic shocks.

This section gives an overview of the process of economic and social change in Vietnam between 1986 and 2005. We especially focus on the interplay between environmental degradation, cash cropping and migration in the province of Dak Lak in the Central Highlands.

Box 1. Natural conditions and population in Vietnam

Most of Vietnam is hilly or mountainous. Of the total area, 23% is classified as agricultural land and 60% as forest land, yet actual forest cover is less than 30% of total land area. The cultivation area in Vietnam is limited, equating to only 0.11 hectares per capita. Thus the pressure on land and natural resources is considerable.

Paddy is the most important agricultural crop both in terms of being the main staple in daily consumption and as revenue from export. The most intensive cultivation is in the main delta areas, the Red River Delta in the north, the Mekong (Cuu Long) River Delta in the south and in a narrow strip of flat land along the coast, where most of the rural population resides. Seasonally, the country is struck by typhoons from the south-east, causing damage to people, agriculture and infrastructure along the long coast, although the central region is most severely affected.

Vietnam had a population of nearly 80 million in 2002 (World Bank, 2003). This is made up of 54 different ethnic groups, of which the Kinh people form the majority (about 87% of the population). Most of the 53 minority ethnic peoples live in the mountainous areas in the north, in the mountain range along the border with Laos and Cambodia, and in the Central Highlands.

1 We adopt the definition of sustainability in the Constitution of Vietnam (1992) and in the Vietnamese Socio-Economic Development Strategy, 2001-2010 (GOV, 2000): the establishment of a long-term balance between preserving and exploiting natural resources for economic growth, where social benefits are distributed in an equal and participatory way.

2 The field study took place in November 2002, one year before Dak Lak was divided into the two provinces of Dak Lak and Dak Nong. Dak Nong province comprises 6 districts, of which Dak R'Lap is one of the sites for the study. Throughout the report 'Dak Lak' is understood as the province with area and population prior to November 2003.

3 'Social' in this study is understood as 'socio-cultural' indicating that 'social' is a wider concept than merely dealing with issues related to education and health.

2. 1 MAJOR POLICY CHANGES

A landmark policy reform was introduced at the Sixth Communist Party Congress in 1986. Known as *Doi Moi*, this policy would transform Vietnam from a centrally planned to a market-driven economy, albeit one with a socialist orientation. From 1986 to 1995 the Government of Vietnam (GOV) implemented a number of key policy reforms. Of particular relevance to the present study are those in the fields of economics, poverty reduction, land management and migration.

Economic reforms

Economic reforms enabled people to engage in trade and investment more freely and capitalised on the country's most important assets: natural resources, a relatively high level of education and a young population. For almost a decade the country experienced dramatic change, with increased domestic economic activity in a favourable global economic climate. The new policy and legal environment, and the lifting of the US-led trade embargo in 1994, also attracted significant foreign investments, and infrastructure and small scale manufacturing projects increased throughout the country.

Vietnam was on its way to join the ranks of the 'Asian Tiger' economies by the time of the Eighth Party Congress in 1996. However, the Asian economic crisis in 1997 reduced economic development in most sectors. Whilst Vietnam was not as badly hit as neighbouring countries, the Gross Domestic Product (GDP) growth rate fell gradually from its 9.5% peak in 1995 to around 4% in 1998 and 1999 (Hakkala et al., 2001). Since 1999, the economy has gradually recovered.

Since the *Doi Moi* reform, in the agricultural and rural sector, agricultural output and productivity have risen significantly. Food production per capita increased by 50% between 1990 and 2000 (Comprehensive Poverty Reduction and Growth Strategy (CPRGS), Hanoi, 2002) and food security has been achieved at the aggregate country level, primarily due to the dramatic increase in rice production in the Mekong Delta. In addition to a significant growth in rice production, coffee production increased significantly.

Living standards in the country have generally improved. Whilst access to basic services was relatively high pre-*Doi Moi*, more people now have access to basic services including clean water, health care and education. The average rural income has increased, poverty has fallen and overall well-being in rural areas has improved. Generally, even the poorest groups have seen an increase in income and improved access to education and health facilities. Vietnam's Human Development Index (HDI) score rose from 0.603 in 1990 to 0.688 in 2001, moving Vietnam up the country rankings from 121 to 109 (CPRGS, 2002 and UNDP, 2003a). According to the UNDP's Human Development Report (2003a), Vietnam's Gender Development Index (GDI) ranks 87 of 144 countries.

Notwithstanding aggregate gains, the benefits of economic development are distributed unevenly. Income inequality between rich and poor has widened (Table 1), and between rural and urban populations, a gap symptomatic of a more competitive economy since wealth is concentrated in the urban areas that receive most of the investments (Table 2). In addition, the pace of poverty reduction is considerably slower among ethnic minorities than the Kinh majority (Table 3).

Table 1. Increasing inequality

	1993	1998	2002
Gini coefficient	0.33	0.35	0.37[4]
Food expenditure	0.256	0.256	0.274
Non-food expenditure	0.474	0.484	0.49

Source: General Statistical Office (GSO), Vietnam Living Standard Survey (VLSS) 93, VLSS 98, preliminary data from Vietnam Household Living Standard (VHLSS 2002) (from UNDP, 2003b)

Table 2. Poverty rates (%): urban and rural gap

	1993	1998	2002
National poverty rate	58	37	29
Urban poverty rate	25	9	6
Rural poverty rate	66	45	35

Source: GSO, VLSS 93, VLSS 98, preliminary data from VHLSS 2002 (from UNDP, 2003b)

Table 3. Poverty rates (%) by ethnicity

	1993	1998	2002
Ethnic minorities	86	75	70
Kinh	54	31	23

Source: UNDP, 2003b

Poverty reduction

The impact of *Doi Moi* is clearly seen in the dramatic decrease of poverty. Evidence for this comes from the two major ways of calculating poverty incidence in Vietnam: the international poverty line and the national poverty line (Table 4). The former is calculated as an average of 2,100 calories per person per day (UNDP, 2003b) for the 2001–2005 period.[5] The latter is an income of VND 80,000 per person per month for islands and rural mountainous areas, VND 100,000 in rural plain areas and VND 120,000 in urban areas (Ministry of Planning and Investment (MPI), www.mpi.gov.vn). This is based on the financial equivalent of buying a certain amount of rice (UNDP, 2003b). While the two poverty lines use different definitions, the trend they reveal is the same: an overall reduction in poverty.

Table 4. International and national poverty lines and trends

	1993	1998	2002	2010
International poverty rate (%)	58	37	29	20
National poverty rate (%)	30[6]		12	5

Source: GSO, VLSS 93, VLSS 98, preliminary data from VHLSS 2002, Ministry of Labour, Invalids and Social Affairs (MOLISA) 2003 (from UNDP, 2003b)

4 The official data from the VHLSS 2002 showed 0.42 (GSO, 2004).

5 For the 2006–2010 period the Ministry of Labour, Invalids and Social Affairs (MOLISA) plans to introduce a new poverty line: urban residents earning VND 230,000 per capita per month and rural residents earning VND 200,000 or less will be considered poor. The aim is to bring the international and national poverty measures closer to each other (*Vietnam Economic Times*, March 22, 2005). With this new mode of calculation, the poverty rate in urban areas will be 12.2 percent and 23.2 in rural areas.

6 Old national poverty line definition.

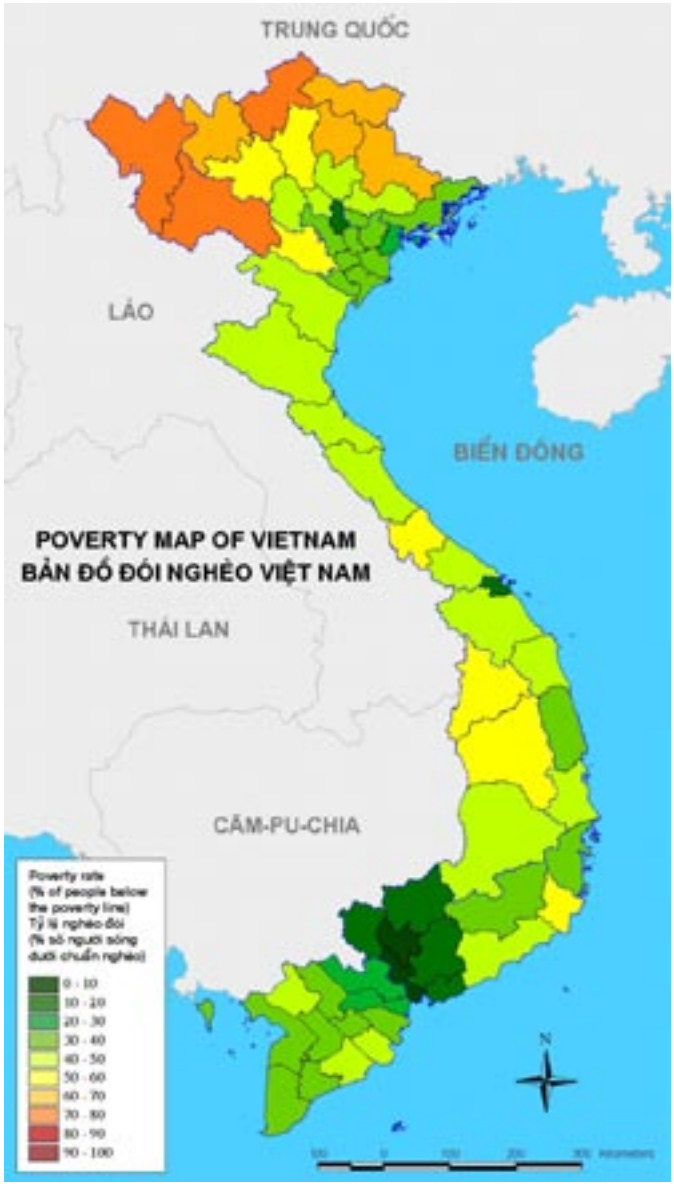

Figure 1. Poverty Map of Vietnam
(Source: The Inter-Ministerial Poverty Mapping Task Force et al. 2003)

Despite major efforts to reduce poverty, many of the non-poor subsist just above the poverty line (Poverty Task Force, 2002). Moreover, income distribution is regionally uneven, with 90% of the poor living in rural areas. Poverty is most prevalent among ethnic minorities in mountainous areas, with 12 of the 13 poorest provinces located in remote areas.[7] Several studies show a strong relationship between 'remoteness' and the poverty rate (UNDP, 2003b; Sachs et al., 2000; GSO, 2003). The highest incidence of poverty occurs in the Northern Mountains and the Central Highlands where Kon Tum, Dak Lak and Gia Lai are among the 12 poorest provinces (UNDP 2003b; and see Map 1).

Levels of *food* poverty in Vietnam almost halved from 30% in 1992 to approximately 18% in 1998 (Norlund et al., 2003). In 2002, the national figure was close to 10% (nearly 4% in urban areas

7 'Remote areas' (*vung sau, vung xa*) in Vietnam are defined as areas which are distant from urban areas and from well-functioning infrastructure.

and 12% in rural areas) with great geographical variation between the south-east (4.6%) and the Northern Mountains and Central Highlands (from 32.8% to 18.9%) (GSO 2004).

Poverty estimates are a complex exercise and they are limited in the sense that they tend to only measure income and/or expenditure levels. There is a need to consider those groups who are close to the poverty line and therefore at risk of falling (back) into poverty. For instance, in Vietnam it is estimated that a further 10% should be added to the current 30% classified as poor (Adger et al., 2001 and UNDP, 2003b).

Poverty reduction efforts (Box 2), as a measure of mean expenditure, have increased only slightly over the years 'pointing at modest improvements in the vulnerability of non-poor households to falling back into poverty' (UNDP, 2003b). Furthermore, if the definition of vulnerability is enlarged to include sensitivity to economic risks, environmental degradation and natural hazards, an even larger proportion of the population would be included. As pointed out by Adger et al. (2001) the food and livelihood security of over 75% of the population *directly* relies on the sustainability of the natural resource base.

Box 2. Government strategies and plans for poverty reduction

Poverty reduction is the overarching policy goal in Vietnam. The main route is perceived to be broad-based economic growth with structural reforms to promote employment and exports (Beckman, 2001). Government of Vietnam (GOV) strategies and plans aimed at further reducing the poverty rate include the *Strategy for Socio-economic Development in 2001–2010* and the *Five-year Plan for Socio-economic Development from 2001 to 2005*. Altogether, six national sector strategies have been approved for the period 2001–2010 (Norlund et al., 2003) and each province has developed its own strategies and five-year plans. An influential programme in the rural areas is the Hunger Eradication and Poverty Reduction Programme (HEPR), managed by the Ministry of Labour, Invalids and Social Affairs (MOLISA). This involves activities such as infrastructure for poor communes support to disadvantaged ethnic groups; fixed cultivation and sedentarisation; planned resettlement of people to New Economic Zones (NEZ); training programmes for the poor in business skills, credit, health care and education; support for expansion of industry and trade in poor communes; and training of poverty reduction workers in poor communes. Other programmes include the *135 Programme*, which is targeting about 1,000 of the poorest communes with improved infrastructure, mainly roads, electricity, schools and health clinics.

In July 2004, 'Decision 134' was issued to specifically target poor ethnic households across the country. Each household is to be allocated at least 5,000 square metres of farming land, or at least 2,500 square metres of one-crop paddy or no less than 1,500 square metres of two-crop paddy field. In addition, each family will also be given at least 200 square metres of residential land plus VND 5 million for house construction. Each family will also get half a ton of cement for building a water tank, or VND 300,000 for drilling a water well (*Saigon Times Daily*, September 2004).

Reform of the credit system in Vietnam has also improved poor people's access to credit at low interest rates and sometimes also with collateral exemptions. The establishment of the Vietnam Bank for Agriculture in 1990, the Vietnam Bank for the Poor in 1995, and the Vietnam Bank for Social Policies in 2003 was intended to reach the poorest strata of the population.

The donor society, headed by the World Bank, has helped to develop a Comprehensive Poverty Reduction and Growth Strategy (CPRGS, 2002), translating the GOV strategy into an action plan more suitable to the foreign support agenda. In this case, 'the enactment of the CPRGS merely required the signature of the Prime Minister. It did not have to be passed by the National Assembly, because the CPRGS is treated under the Vietnamese constitution as a revision of an existing approved document based on the ten-year strategy' (Norlund et al., 2003).

Land management and land use

Land reform under *Doi Moi* has gone through a number of transformations, changing from the cooperative to the household as the primary unit of production. The *1988 Land Law* formed the first legal basis for allocating agricultural land to individual households and other economic units.

Tenure on agricultural land is given in the form of a Land Use Certificate (LUC), valid for 20 years. Land allocation has increased yields through the combination of increased household investment in production (labour and other inputs), improved agricultural extension services and the availability of better seed, fertilisers and cultivation practices.

The *1993 Land Law* was the most radical instrument to date for regulating institutions' and individuals' access to land through state land allocation. This law was further revised in 2003 to become the *2003 Land Law* (see Box 3).

Box 3. The 2003 Land Law

The *2003 Land Law* (Hanoi, 2004) is the most comprehensive of all land laws and regulations so far, although the basic principle remains that land is the property of the entire population, albeit under the management of the state. At the central level, the Ministry of Natural Resources and Environment (MONRE) is responsible for land management. People's Councils (local governments) at all levels—province, district and commune—supervise the implementation of the land legislation. People's Committees (local parliaments) at all levels represent ownership of land and carry out state management of land.

Land is classified into three categories: agricultural land, non-agricultural land, and unused land or land where the purpose is yet to be determined. Agricultural land includes eight land use purposes:

(i) cultivation of annual crops, (ii) cultivation of perennial crops, (iii) production forests, (iv) protection forests (e.g. watershed protection), (v) special-use forests (e.g. national parks and reserves), (vi) aquatic farming, (vii) salt production (viii) other agricultural lands as determined by the GOV.

Basically, land users have the right to: (i) exchange (*chuyen doi*); (ii) transfer (*chuyen nhuong*); (iii) lease (*cho thue*); (iv) sub-lease (*cho thue lai*); (v) inherit (*thua ke*); (vi) donate land use rights (*tang cho quyen su dung dat*) (vii) mortgage (*the chap*); (viii) guarantee (*bao hanh*); (ix) make capital contribution in the form of land use rights (*gop von bang quyen su dung dat*) and (x) receive compensation upon recovery of land by the State (*duoc boi thuong khi Nha nuoc thu hoi dat*). This new land law doubles the number of use rights.

The land use terms for households and individuals are 20 years for annual crops, aquatic farming and salt production and 50 years for perennial crops and production forests.

As stipulated in the law,[8] land classified as agricultural and forest land is allocated to land users. However, forest land of all categories is in principle managed directly by the state through the State Forest Enterprises (SFE) and other state units such as national parks and reserves. Although forest land may be allocated to households by the SFE, in practice, this forest land is not valuable natural forest, but is often degraded or plantation forest. The *2003 Land Law* has not changed that basic principle; however, the state has tested different forms of community forestry, for example in Dak Lak (Sikor and Apel, 1998; Bao et al., 1999; Tran et al., 2002). This demonstrates a willingness to admit that local people, and especially ethnic minority groups, are *de facto* users of the forest and that the state has monopolised its management.

Generally local people and communities continue to lack legal status as forest managers (Tran et al., 2002). Also, forest land allocation to households (in its present form) has been slower than in the agriculture sector. The government and SFEs seem reluctant to give up forest resources, and farmers are reluctant to assume responsibility under restrictive conditions (GOV, 1998). Forest land allocation accompanied by the clear definition of rights and benefits is necessary (MARD, 2001), and recent policies are moving in that direction (GOV, 2001).

Another contentious land use issue is whether shifting cultivation is the main cause of forest degradation as often suggested by Vietnamese officials at different levels. Swidden farming by ethnic minority groups is most often blamed for forest destruction (eg. Salemink, 1998). Others

8 In this study we use the 1993 definition of agricultural and forest land where the forest land is not included in agricultural land.

feel that illegal logging by different state entities and forest clearance by migrant groups to grow cash crops are the most destructive activities (e.g. Bao et al., 1999; Hung and Vorpahl, 1997; Tran et al., 2002). Officials do sometimes recognise that 'abuse of the forest' by state economic units does occur (People's Committee of Dak Lak Province, 1995).

It is important in this debate to distinguish between the slash-and-burn techniques of locally indigenous farmers and the pioneering agriculture of peasants or recent settlers (De Koninck, 1998 and 2000). Pioneering agriculture is a technical term to describe non-sustainable slash-and-burn techniques where the forest is cut down without due consideration to forest type, rotational cycles and length of fallow periods. These pioneering shifting cultivators often abandon the cultivated areas once they have lost soil cover and fertility, usually caused by ploughing the land and other unsustainable techniques. For example, in Dak Lak Province the ethnic minority groups form two distinct categories: the indigenous peoples, the Ede and M'nong, and the ethnic minority groups who migrated from the north. The former were traditionally caretakers of their environment upon which they depended and still depend, while the latter are pioneering cultivators and cause the most destruction to the forest.

Migration

In 1975 the population of the newly united Vietnam was about 30 million. It has since increased by nearly 2 million people per year (UNDP HDR, 2003). Significant internal migration, both planned and spontaneous, has occurred.[9] Planned migration came about through the New Economic Zones (NEZ) policy which began in 1960. Its aims were:

> *to balance the distribution between population and land by resettling people from the densely populated area in the Red River Delta to areas perceived as thinly populated (such as the Central Highlands). A second aim was to establish and develop new rural areas and create job opportunities, a third reason was to strengthen the national solidarity and develop the cultural and economic lives of people in remote areas, and, finally, to promote national defence and protect the environment (MOLISA; Report on the Result of the Survey on Rural Migration in Dak Lak province, 1997).*

In reality, this most often took the form of employment in state agricultural and forestry enterprises in the NEZs (Hardy, 2000). Official figures indicate that between 1976 and 1995, 4.75 million people were resettled under the NEZ policy, although according to Desbarats (cited in UNDP, 1998) only half of those resettled actually stayed.

Spontaneous migration in greater numbers began in 1986 when the *Doi Moi* reforms allowed for free settlement anywhere in the country (Dang, 2003). Other contributing factors included: assigning land-use rights to the family (a way of increasing productivity while encouraging people to stay in the rural areas); abolishment of the ration system, thereby breaking the link between residence and access to services; and the easing of restrictions of private sector involvement in transportation, communication and trade allowing for increased access to information and general mobility (UNDP, 1998).

Migration does not only include relocation from rural to urban areas but also, notably, between rural areas. Between 1994 and 1999 4.5 million people[10] migrated, of which the largest category (37%) was rural-rural migrants (GSO and UNDP, 2001).

9 For an historical overview, see Khong Dien: *Population and Ethno-Demography in Vietnam*. Chiang Mai, Silkworm Books, 2002.

10 Over five years of age.

The bulk of planned migration (to NEZs) occurred after the war (1975) until about the mid-1990s, while the largest groups of spontaneous migrants in a way "replaced" the planned migrants. Most planned and spontaneous migrants headed for the Central Highlands (Figure 2), where the population doubled to three million (of which one million were estimated to be migrants) over the two decades after 1975 (Hardy, 2000; see also Hardy, 2003).

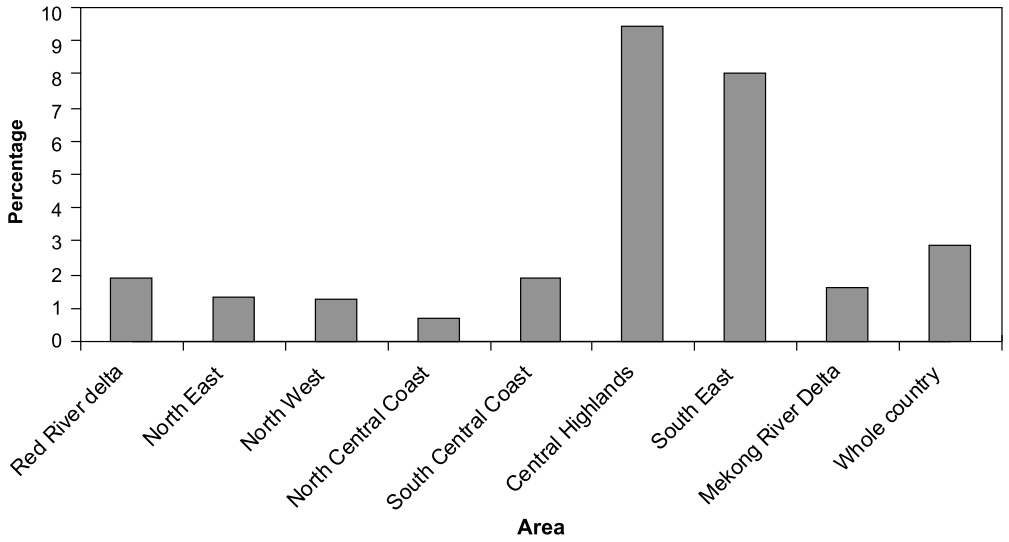

Figure 2. Migration patterns 1994–1999 (Source GSO – UNDP, 2001)

A number of studies and analyses highlight the pros and cons of migration (in Vietnam and elsewhere). On the one hand it enhances social resilience[11] by providing new opportunities, but on the other it undermines resilience by weakening social structures and access to natural resources (Locke et al., 2000; Hardy, 2000; Jamieson et al., 1998). Generally, the environmental impacts of migration, both in urban and rural areas, are adverse (UNDP, 1998). The impacts of migration in the Central Highlands and in Dak Lak in particular are outlined later.

Another form of government regulation of settlements was the Fixed Cultivation and Sedentarisation Programme (FCSP).The programme began in 1968 and still continues (Khong Dien, 2002). Its aim is to convince swidden farmers to stop their traditional cultivation practices; move them into villages to improve their access to social services; and introduce or increase wet rice cultivation and marketable crops and livestock. The constraints of this policy are many (see for example Do 1994 and Salemink 1997 and 2000), as we shall see later.

2.2 AGRICULTURAL PRODUCTION FOR EXPORT

Cash cropping is regarded by the government as an important driver of economic growth in both delta and remote rural areas.

Rice, the main food staple, has also become a key cash crop. Rice is grown as a rainfed or irrigated crop in the lowlands and as a rainfed dry land crop in the uplands. Rice productivity and cultivation areas are increasing nationally. Rice yields increased from an average of 3.7 tonnes per hectare in 1995 to an estimated 4.3 tonnes in 2000, and the areas of rice cultivation increased from 6.7 million

11 Social resilience is generally understood as the ability of a community to withstand external shocks and stresses without significant upheaval (for example in Adger, et al., 2002).

hectares in 1995 to an estimated 7.6 million in 2000 (IMF, 2002). Before the Land Law of 1988, Vietnam was a net importer of rice. But for the last 10 years, rice has been exported and is one of Vietnam's 10 most important commodities in terms of export income (IMF, 2002).

State agriculture extension agents are encouraging farmers to replace dry rice cultivation with wet-rice production (either rainfed or irrigated) in remote rural areas for both cash cropping and subsistence. Recently-arrived Kinh farmers are also introducing wet-rice technologies to these areas. However, yields are low because of the marginal growing conditions, especially for wet rice. There are a number of reasons for this: cultivable land has been difficult to mechanise; the plots of land along rivers and creeks are small; under-developed markets provide few incentives (in particular before *Doi Moi*); and the disruption caused by war and displacement. This is in sharp contrast to the situation in the two main delta areas, where yields per hectare are tenfold higher than in the remote areas of Dak Lak Province.

While coffee and rubber come lower in the list of Vietnam's 10 most important export commodities, both crops play an important role in the local economies of the Central Highlands. There has been a remarkable expansion of coffee as an important cash crop, with 90% of production for export (ICARD and Oxfam, 2002). In 1990 production was 100,000 tonnes on 50,000 hectares. This had increased to 500,000 tonnes on over 500,000 hectares in 2000 (Trinh et al., 2000; and IMF, 2002). The big expansion in coffee production saw Vietnam become the second largest coffee exporter in the world in 2000 (Oxfam, 2002 and Box 4). Most (85 to 90%) of the planted area is cultivated by small farmers (each farming around one hectare) and the remainder by state-owned farms of both central and local governments (de Fontenay and Leung, 2001).

Box 4. Vietnamese coffee in a global context

The Vietnamese coffee sector grew rapidly in the 1990s. In 1984, Vietnam exported a negligible 3,939 tonnes, but this had risen to 697,866 tonnes in 2003 (ICO, 2004). Key changes in the domestic and international context explain the growth in production. First, the GOV policy of (*Doi Moi*) encouraged the growth of the coffee sector by enabling foreign investment in trading and exports and providing incentives for farmers to migrate to coffee growing areas, primarily in Dak Lak Province. These incentives included irrigation subsidies and extension services. Second, international market conditions in the early and mid-1990s were favourable for the growth of the Vietnamese coffee sector. The high prices encouraged development agencies, the GOV and farmers to invest in coffee. The depressed international production in the mid-1990s, due in part to the frost and drought in Brazil, created a niche for Vietnamese export in the market for Robusta. Third, roaster use of Robusta increased in the 1990s, as technology changes enabled roasters to attain more flavour from the low-quality Robusta beans, therefore encouraging increased demand for Robusta (Oxfam 2002). Fourth, the absence of international market governance following the collapse of the International Coffee Agreement (ICA) removed institutional obstacles to the expansion of the Vietnamese coffee sector.

However, Oxfam (2002) clearly shows that Vietnam, like many other developing countries, is caught in the world trade trap as a raw material producer, with most of the profits going to actors other than farmers.

However, there are number of constraints to the coffee boom in Vietnam (Tan, 2000; de Fontenay and Leung, 2001; ICARD and Oxfam, 2002; Oxfam, 2002; Worldbank/Commodity Risk Management Group, 2002; and Dang and Shively, 2004). This is illustrated by the two figures below on volumes, areas and prices. Prices are indeed fluctuating dramatically making coffee growing a high-risk venture for farmers.

These risks can be summarised as follows:

- dependency on fluctuations in export prices
- the coffee tree's demand for costly inputs of water and fertilisers

- farmers operating individually on a small-scale basis without supporting institutions
- dependency on credit institutions
- natural hazards such as droughts
- agronomic and economic risks of monoculture
- lack of insurance

In this study we hope to contribute further to the understanding of these risks by analysing their combined impact.

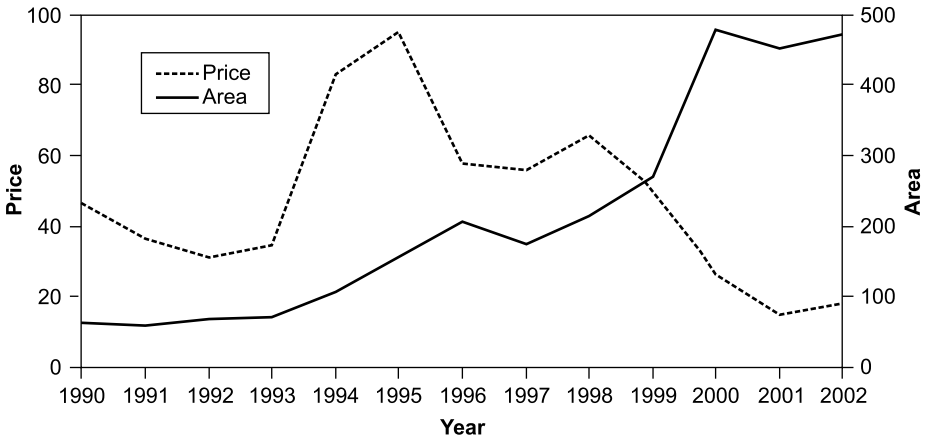

Figure 3. Farm gate and harvested coffee area, Vietnam, 1990–2002
(Source: Dang and Shively, 2004)

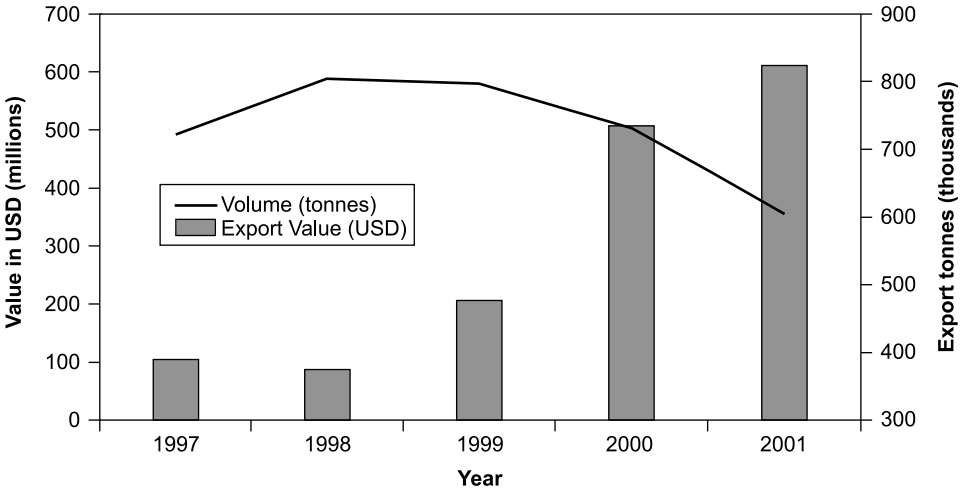

Figure 4. Vietnamese coffee export volumes and values, 1997–2001
(Source MARD; cited in World Bank International Task Force on Commodity Risk Management (2002).

2.3 DAK LAK: A CASE STUDY

We chose Dak Lak Province (see Box 5) for our study for a number of reasons. These include the rapid expansion of coffee; the significant population increase[12]; the resulting forest loss and land degradation; and the increased risks for smallholder coffee farmers. This made Dak Lak an ideal

12 There is a close relationship between the rapid population increase, which was largely due to migration, and the expansion of the coffee areas (Tan, 2000 cited in World Bank/Commodity Risk Management Group, 2002).

area to study the combined risks and coping strategies at different scales, allowing for an analysis of the issues of poverty and vulnerability, and an exploration of the relationship between them.

Box 5. Dak Lak: basic features

Dak Lak Province is located in the Central Highlands of Vietnam and lies to the east of the Cambodia border (see Map 2). It is the largest province in Vietnam, covering almost 2 million hectares. About 22% of the province is used for agricultural production. Coffee is the dominant crop (nearly 60% of the area), but other important crops include rice, maize, rubber, beans, groundnuts and cotton.

Among the provinces in Vietnam, Dak Lak has the largest area of forested land in absolute terms. The roughly one million hectares of natural forest are home to many valuable timber species and non-timber forest products (NTFPs). Large wild animals include elephant, bull, bear, tiger, panther, deer and boar (ActionAid Vietnam, 2003). A number of mammal species have only recently come to the attention of international science, indicating the high biodiversity value of the region.

In 2001, the total population was close to 2 million, most of whom were Kinh (70%). Most of the other ethnic groups comprised indigenous peoples such as the Ede and M'nong, Gia Rai and Xe Dang. The remainder is made up of recently arrived ethnic groups such as the Nung, Tay, Thai and Dao. All in all, there are 43 ethnic minority groups in the province, including minority peoples who have migrated from the north (Statistical Yearbooks, Dak Lak Province 1985, 1994, 1999, 2000 and 2001).

Figure 5. Map of Dak Lak and study areas

Rapid population increase

Whilst the national population has grown rapidly in the post-war period, population growth in Dak Lak has been the most rapid, growing at an annual rate of 6% between 1975 and 2002. Most of Dak Lak's population is rural, some 80%, and whilst the population density is the lowest in the country (92 persons/km^2 compared to the national average of 219 persons/km^2) there are signs, as documented in this paper, that this population density is placing great stress on natural resources.

Determining the precise number of migrants is difficult, despite several sources of information on migration to Dak Lak. The difficulty of keeping track of the spontaneous migrants precludes data collection. According to official statistics for 1976–1999, some 650,000 people migrated to Dak Lak, almost equally divided between state-controlled and spontaneous (Figure 6).[13] The state-controlled migrants relocated through the NEZ programme are from the majority Kinh ethnic group, as most came from the areas subject to greatest population pressure, predominantly Kinh areas. The spontaneous migrants are also dominated by the Kinh (Figure 7), but also include ethnic minority groups from northern Vietnam.

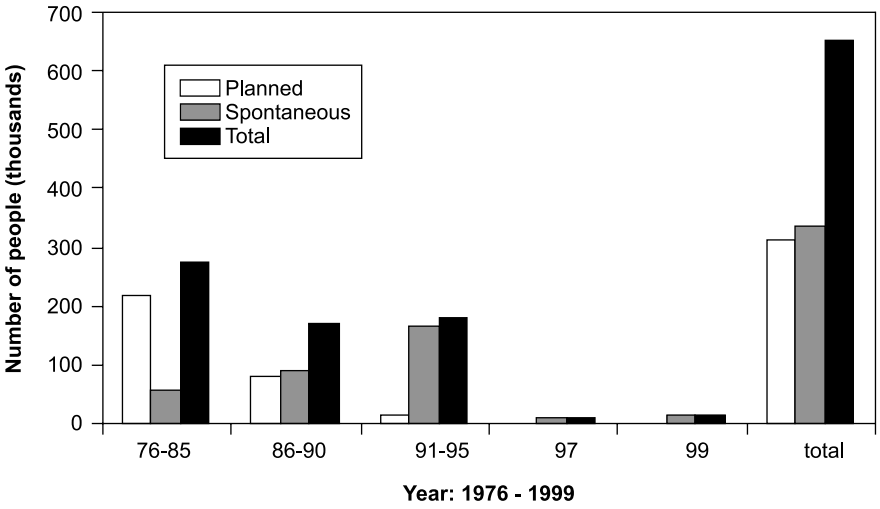

Figure 6. Migration to Dak Lak (Source: Dak Lak Statistical Yearbooks)

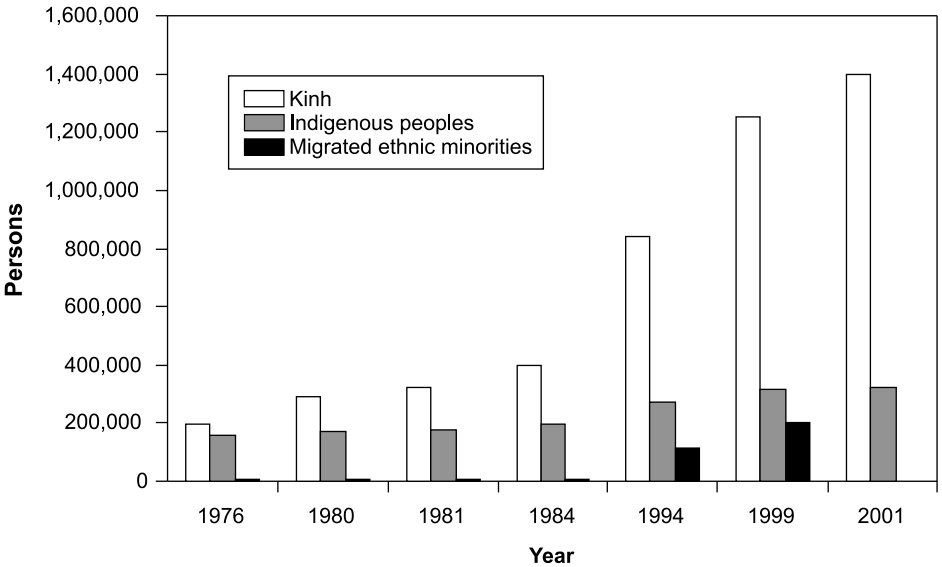

Figure 7. Population and ethnicity in Dak Lak 1976–2001 (Source: Dak Lak Statistical Yearbooks)

13 The official figure on actual in-migration is low, according to Khong Dien (2002).

The great influx of migrants caused a combination of environmental, economic, social and cultural problems. These affected both the migrants and the indigenous 'host' communities. A detailed study of migration to Dak Lak between 1986 and 1996 (MOLISA, 1997), states: 'Forest and the natural environment have been destroyed and land used by minority groups (has) been used by migrants'. While this study did not mention any negative impacts of planned migration (NEZ), Jamieson (1996) explained how control of 86% of the land in Dak Lak by state farm and forest enterprises left limited land for the indigenous peoples.

The seriousness of the situation became apparent at a workshop (hosted by MARD and UNDP) in Hanoi in 1998[14] where the Vice Chairwoman of the Dak Lak Provincial People's Committee, Huynh Thi Xuan, made a strong appeal to halt migration, claiming that Dak Lak and the Central Highlands could not handle any more migrants (Salemink, 1998). According to the official figures, migration as a whole did decline sharply around 1997–98; spontaneous settlements still occur, albeit at a slower pace.

Rapid coffee expansion

From the early 1990s investments in coffee caused a rapid change in land use in the Central Highlands,[15] the region most suitable to coffee growing. Since 1975, there has been an eight-fold increase in agricultural land. The rise in the area under coffee has been particularly dramatic, now covering roughly half of the province's agricultural land area (Dak Lak Province Statistical Yearbooks). Between 1990 and 2000 an estimated two-thirds of the coffee growth in the province was due to area expansion (ICARD and Oxfam, 2002). This expansion has involved following three land types with coffee trees: forests, upland rice grown on forest land, and agricultural land supporting annual crops (Ahmad, 2000; and see Figure 8 and 9).

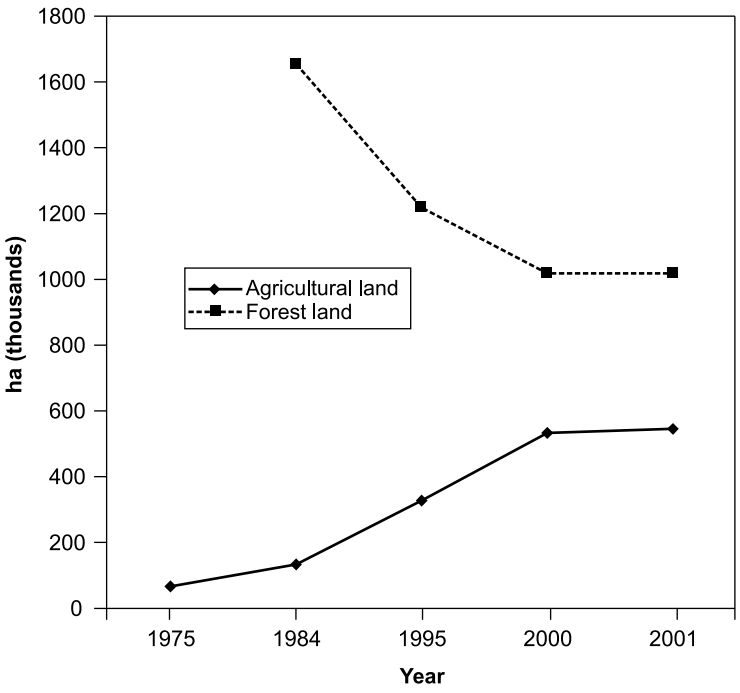

Figure 8. Changes in agriculture and forest land 1975–2001 (Source: Dak Lak Statistical Yearbooks)

14 *International Seminar on Internal Migration: Implication for Migration Policy in Vietnam.*
15 Including the provinces of Lam Dong, Dak Lak, Gia Lai and Kon Tum in south-west Vietnam.

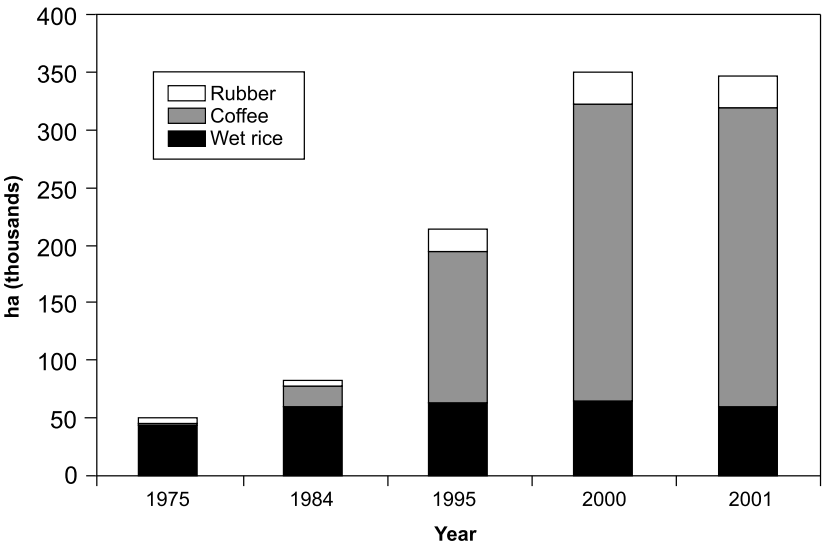

Figure 9. Changes in use of agricultural land 1975–2001 (Source: Dak Lak Statistical Yearbooks)

Dak Lak accounts for 50% of the national output of coffee (Oxfam, 2002) and 50% of the total coffee area in Vietnam (WB/Commodity Risk Management Group, 2002). The coffee crop accounted for over 95% of local incomes (de Fontenay and Leung, 2001) and the annual income per capita nearly doubled during 1990–2000, from USD 204 to USD 390, because of the rise in coffee prices (Dang and Shively, 2004).

During the coffee boom in the 1990s it seems that virtually everybody, including the poor, were gaining from the high prices of coffee. Later, when the coffee prices fell dramatically, the impact of the strong and even aggressive coffee expansion became more evident. In reality, it had taken its toll on both the environment and livelihoods. As the coffee prices began to fall differences in the vulnerability of groups by income and ethnicity became apparent in the coping strategies they selected, their rationale and the degree of resilience they exhibited.

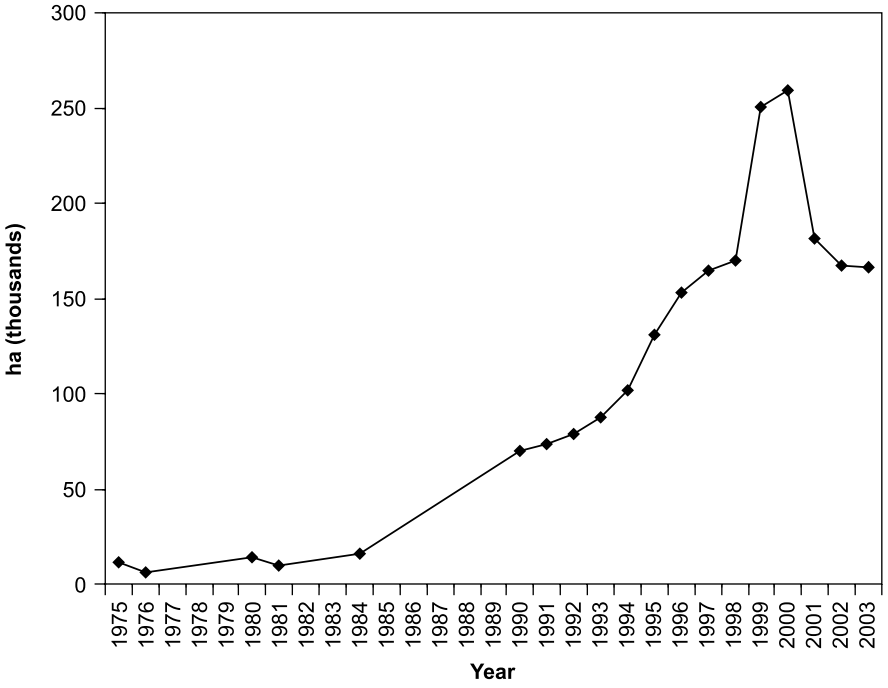

Figure 10. Coffee production area in Dak Lak, 1975–2003 (Source: Dak Lak Statistical Yearbooks)

Environmental degradation and natural hazards

From 1983 to 2001, forest cover in Dak Lak declined by over 600,000 hectares, including 230,000 hectares of natural forest[16] (Dak Lak Province Statistical Yearbooks 1985 and 2001). In 1983, 80%[17] of Dak Lak's total land area was natural forest. This had fallen to little more than 50% by 2001, with an average rate of loss of about 20,000 hectares a year (ADB, 2003). The remaining forest is of lower quality. Deforestation leads to degraded watersheds, water scarcity, soil erosion and depletion of the upland ecosystems (e.g. Ahmad, 2000; Trinh et al., 2000).

While researchers have not fully investigated the long-term impacts of environmental degradation, the UNDP/MARD Disaster Management Unit produces yearly reports on the specific effects of droughts, floods and other hazards. These reports indicate that environmental variability causes significant human and economic costs. In March 2003 this unit reported that a five-month drought had affected more than 27,500 hectares of coffee, and another 49,000 hectares were potentially affected. Water levels in rivers and reservoirs fell dramatically, to between 2 and 10 metres below normal. Irrigation of coffee trees has certainly been a major contributor to the lower ground water table.

In August 2003, the same unit reported that flash floods had killed six people in Cu M'gar and Bon Don Districts and destroyed 1,000 hectares of paddy. Bridges and temporary dams were swept away or broken. One year later, in November 2004, the water reservoirs were reported by MARD to contain only 60% of their intended capacity. Due to serious water shortage local farmers are likely to lose their crops on over 123,000 hectares including rice, maize and various trees. And as recently as March 2005 Vietnamese radio announced that, 'Drought leaves 500,000 hungry in Vietnam'. Out of the nine provinces, Dak Lak and Dak Nong have suffered most of the damage this winter-spring season, at a value of USD 63 and 3 million respectively.

Government policies

The Ministry of Agriculture and Rural Development proposed that the Central Highlands should receive 1.7 million additional migrants between 1996 and 2010 (MARD, 1996), 663,000 of whom should go to Dak Lak. The strategy also included measures for improving the living conditions of 1 million people of minority ethnic origin and 121,000 households of recently settled migrants. The national Socio-economic Development Programmes for 1996–2000 and 2001–2010 include plans for reforestation to reach a forest cover of 70% of the whole country, continued emphasis on the two main cash crops, coffee and rubber, with diversification into cotton, sericulture and sugar cane (GOV, 1996). The policy recommended installing irrigation to increase wet rice production and growing high-yield cassava, maize, vegetables and fruit trees. The policy also encouraged livestock breeding for milk and meat production, and the development of agro-forestry products. Among the reforms in education and health, most notable was that the curricula in the primary schools should be compiled and delivered in both Kinh and ethnic languages.

Policies related to coffee production have included converting between 94,000 and 130,000 hectares of Robusta coffee fields in the four provinces of the Central Highlands to more profitable crops such as cotton, cashew nuts and rubber (Vietnam News Briefs, April 24, 2003). In Dak Lak alone, 40,000 hectares have already been converted to cocoa, pepper, rubber, fruits, cashew nuts, cotton and corn according to Vicofa, the Vietnam Coffee and Cocoa Association (News Information September 29, 2003).

16 Natural forest is classified as the high quality forest. Other kinds of forest include re-generated forest, planted forest, land with bushes and trees. (Personal communication, DARD, Buon Ma Thuot, November 2002).

17 In 1960 the forest cover was as high as 90% according to Dang and Shively (2004).

The province has also piloted community-based management solutions, such as establishing Water Utilisation Associations and Community Forestry groups. Such organisations could play a part in abatement and coping strategies in the future.

In the next chapter we outline our methodological approach to studying the impact of change on vulnerability in Dak Lak Province.

3 Analytical framework

Despite the enormous growth in agricultural production, Dak Lak remains an impoverished province (UNDP, 2002; Table 1; GSO, 2004). Dak Lak People's Committee registered nearly 60,000 households (20% of the population) as below the poverty line in 1999 (Tran, 1999). In November 2002, DARD reported to this research team that 94,000 households (25% of the population) were poor.

However, there is potential to improve livelihood conditions in Dak Lak. The climate and soil are favourable for investment in agri-businesses, and according to the provincial government, there is still good quality land available for large-scale production as well as for small household farm units.

So why is Dak Lak not realising this potential? According to some, this is mainly due to provincial mis-management and *ad hoc* development interventions, and the largely free access to natural resources by state enterprises and migrants (Ahmad, 2000; Sikor, 2000; Tran et al., 2002). The costs of environmental degradation have been considerable, including a serious decrease in forest resources and available water and an increase in soil erosion (Oxfam, 2002; and Tran et al., 2002). This has social consequences for the indigenous peoples who are highly dependent on these resources for their livelihood and who need large tracts of land for swidden systems and extensive agro-forestry.

These issues make Dak Lak a suitable place for us to explore the complex consequences of social, environmental and political change and how they relate to economic development. These changes are simultaneous and interactive, operating at different scales: local, provincial, national and global. Our aim was to explore this complexity and the linkages between poverty and vulnerability. We compared three communities representing three different land use systems to assess the impacts of fluctuating commodity prices, demographic change and biophysical variability/change.

We asked:

1. What are the effects of these changes? Are there interactions among them? If so, what type(s) of interactions?
2. How are people with different agricultural practices coping with the changes?

Our research hypotheses were:

- A specific locality is affected by stressors emanating from all levels, including the global level.
- There are differences in vulnerability between localities.
- There are vulnerable people among all groups in all conditions.
- Diversification reduces vulnerability.

Before discussing our case study methodology in more detail, we outline some background concepts such as poverty, vulnerability and agency. These help us identify the factors leading to risk, the degree of risk, and the agents involved.

3.1 POVERTY

Quantitative measurements of poverty, such as income and expenditure per capita and degree of access to (and sometimes also control of) education, health, land, capital, knowledge and other resources, distinguish the better-off from the poor in a general way. At a household level, people often define poverty as a lack of resources to sustain themselves in the short and long run. However, poverty is not only about material resources, but also implies a lack of cultural and spiritual meaning in terms of society, culture, ethnicity and empowerment (Chamberlain/ADB, 2001). In his Participatory Poverty Assessment in Lao PDR, Chamberlain found a Western urban bias in the definition of poverty which emphasises physical criteria over mental criteria. In addition, there is a problem of definition: according to Gordon and Spickler (quoted in Chamberlain/ADB, 2001) there are 11 bases for definitions of poverty currently in use: (1) need, (2) standard of living, (3) limited resources, (4) lack of basic security, (5) lack of entitlement, (6) multiple deprivation, (7) exclusion, (8) inequality, (9) class, (10) dependency and (11) unacceptable hardship. 'Poverty emerges then as a loosely structured proposition, not a finite concept and remains prone to all of the influences and interpretations that serve the interests of many and varied institutions and stakeholders involved in the alleviation of it' (Chamberlain/ADB, 2001).

In the case of Laos, where ethnicity is closely related to degree of poverty (as in Vietnam), 'villagers do not perceive poverty as an endemic condition but as something "new", the result of events beyond their control, such as weather, war, resettlement, livestock disease, and poorly implemented development programs. The "new poverty" is associated with calamity, misfortune, fate, karma etc. and its substance is both physical and spiritual' (Chamberlain/ADB, 2001).

Studies in Vietnam also confirm the existence of this 'new poverty'. The migration survey of Dak Lak in 1996 (MOLISA) may not have intended to illustrate this new poverty. Data in the survey on land size, income, savings, and other assets showed generally higher figures among the non-migrant groups than among the planned and spontaneous groups. While defining the non-migrants as mainly indigenous including 'a large proportion of ethnic minorities (52%)', the survey primarily shows that migrants, being newcomers, have not had time to accumulate many assets. However, comparing income levels of the non-migrants in the MOLISA survey with our data suggests that indigenous peoples have been impoverished in absolute terms. In a study for the Vietnam-Sweden Mountain Rural Development Programme, Jorgensen found that recent reforms had generally created better economic opportunities for the better-off, while the situation of the already poor and vulnerable had become worse. This was because of the erosion of traditional social arrangements that offered security in terms of shared wealth or shared poverty: poverty is deepening and becoming individualised (cited by Salemink, 1998).

Other experiences from Vietnam (e.g. Lindskog and Vu, 2004 and this study) also confirm the importance of the spiritual aspect of poverty. Indigenous people suffer from a loss of influence over events and therefore a loss of self-esteem. They feel a sense of alienation when the mode of (agricultural) production no longer uses natural resources sustainably as they used to in the past. The 'wholeness' is lost. Other factors related to identity are the differences between matrilinear and patrilinear communities;[18] development programmes usually deliberately favour the patrilinear Kinh system, automatically depriving women in the matrilinear systems of their status and influence.

18 While the Kinh tend to be patrilinear, several indigenous peoples in the Central Highlands are matrilinear (eg. the Ede, M'nong and Gia Rai). These systems reflect the degree of male versus female status, power and influence through assets, and heritage and traditions such as choice of future husband/wife.

3.2 VULNERABILITY

The impacts of stress are often experienced differently by different groups, sectors and regions. The magnitude of these impacts depends on the particular characteristics of an event and the vulnerability of the human-environment systems involved (Figure 11). Vulnerability has been defined in many ways. One definition is the degree to which a system or unit (such as a human group or a place) is likely to experience harm due to exposure to perturbations or stresses. Vulnerability is commonly understood to have three main dimensions which we describe as follows:

1. *exposure* to stresses, perturbations, and shocks
2. the *sensitivity* of people, places and ecosystems to the stress or perturbation, including their capacity to anticipate and cope with the stress
3. the *resilience* of the exposed people, places and ecosystems; that is their ability to *recover* from the stress and to *buffer* themselves against and *adapt* to future stresses and perturbations

As a general concept, vulnerability is widely known. However, it has been only in the last dozen years that the scientific community at large has made a substantial effort to refine the conceptualisation and analytical methods. Research dating back to the 1970s on the different consequences of events like earthquakes, floods and cyclones identified a continuing pattern of much higher loss of life in less developed countries than developed countries (Burton et al., 1978). Developed countries experienced higher economic losses in absolute dollar terms, although if economic losses are expressed as a percentage of Gross National Product (GNP), again the consequences for developing countries appear greater.

At a finer scale, patterns of difference among populations are also apparent, as women, men, children, and the elderly often experience different consequences from the same event. These differences depend on physical health, social differences in endowments and entitlements and other factors that influence both their sensitivity and resilience. In other research areas, the differences in ecosystem and agro-ecological systems to flooding, drought, or other patterns of climate variability are extensively (though not completely) documented. However, implications of the patterns of ownership or tenure that connect those impacts to the distribution of assets within the household have often been quite separate discussions.

As Figure 11 suggests, social and environmental change potentially causes multiple stresses. While most vulnerability assessments examine only one stress, our work in Dak Lak considers the impacts of multiple stressors: population growth, agricultural price volatility and climate variability, and how the interplay of those stresses impinges on coping responses for different types of agricultural livelihoods. While the dynamic nature of vulnerability is indicated by the feedback loops in Figure 11, this framework does not attempt to depict the differences in the rates of processes or the potential for non-linear change and unexpected events punctuating change.

Addressing vulnerability is particularly important for improving the livelihoods of the poor. The poor have fewer resources or options with which to respond to changes. Vulnerability to economic and environmental variations can significantly slow or set back progress towards sustainable livelihoods, especially when much trust is put into mono-cropping. For instance, greater dependency on coffee in Dak Lak has provided economic opportunities while also introducing a new level of vulnerability to drought and to changes in the global coffee market. We believe that smoothing the path to sustainable development requires strategies for reducing vulnerability.

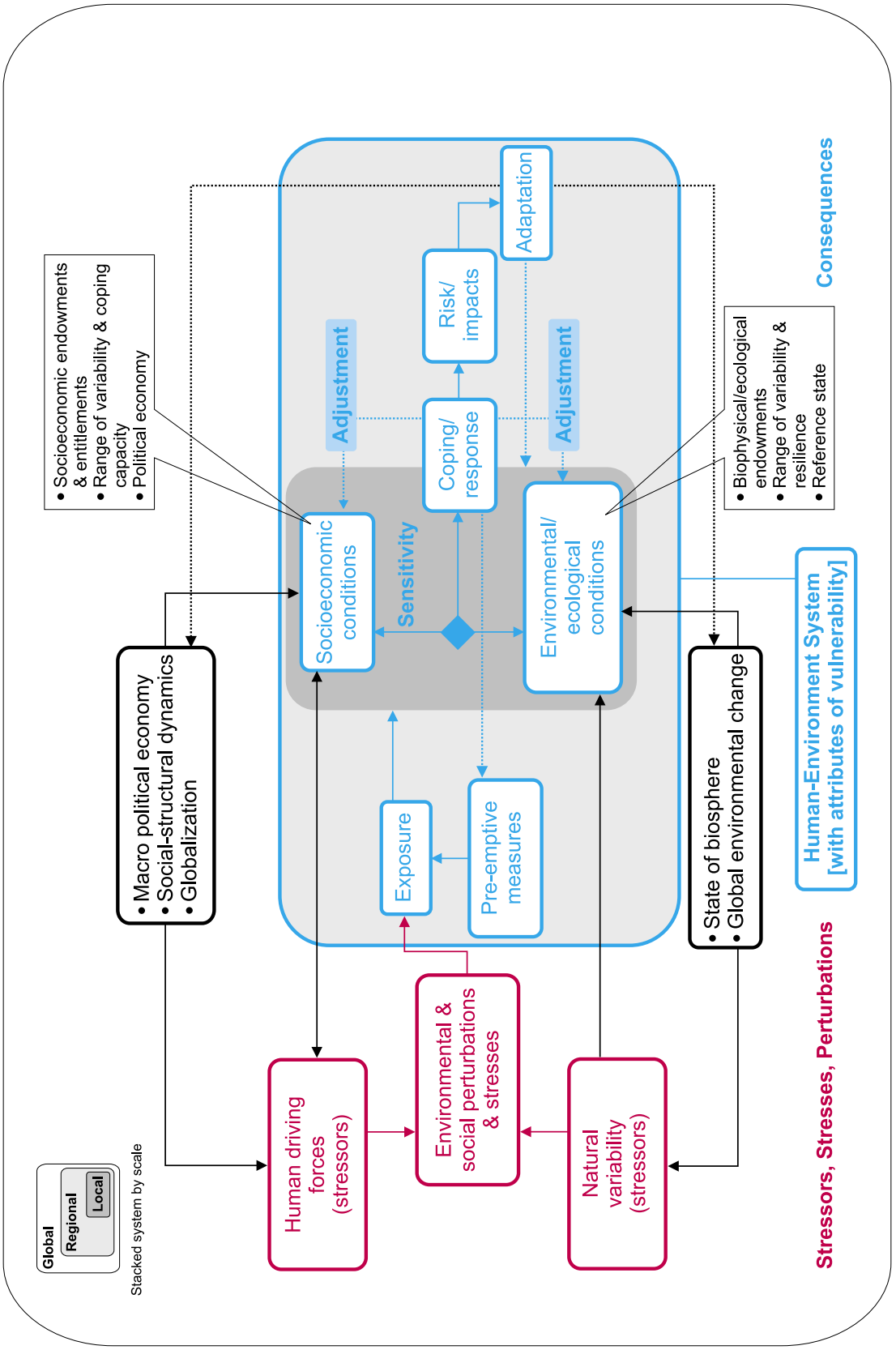

Figure 11. Conceptual framework
(Source: Kaspersen & Kaspersen 2001)

3.3 SUSTAINABLE LIVELIHOODS AND AGENCY

We need to understand sustainable livelihoods alongside poverty and vulnerability. This reveals poverty as a multi-dimensional and dynamic process affected by processes operating at a number of scales. The sustainable livelihoods framework (DFID, no date; Carney, 2002; Chambers and Conway, 1992), is an attempt to capture not just the (tangible and intangible) assets people have, but also access and control over resources, the livelihood strategies people choose to pursue, and their interaction with policies and institutions. As Chambers and Conway write,

> *[S]ustainable livelihoods include not just income and consumption, but ability to handle stress and shocks, and to satisfy basic needs; as defined more broadly, they include environmental sustainability, and good effects on others' livelihoods. SLs have many dimensions and multiple causality. They take different forms for different people in different environments* (1992: 25).

We used the sustainable livelihoods approach in this study as it allowed us to investigate the differences between not only access to resources in different settings, but also the influence of institutions and policies and the relationship these factors have on vulnerability. In this study, culture and local institutions were found to play an important role in people's livelihoods and thus their vulnerability.

'Agency' refers to the fact that vulnerable groups and other actors at different scales are seldom passive spectators in the face of rapid change. On the contrary, all actors or affected peoples and institutions react to change, based on their capability to cope, overcome and adjust to the new situations and challenges. Agency implies all kinds of actions (including no action at all) and reactions to events having an impact on livelihoods conditions.

3.4 STUDY AREAS AND METHODS

This study was a collaboration between SEI, the Institute of Tropical Biology in Ho Chi Minh City and the Tay Nguyen University (TNU) in Buon Ma Thuot. Together with the researchers at the Tay Nguyen University (TNU), we chose three study areas (Map 2) representing three different agricultural practices:

1. coffee production, covering two communes (Cu Sue and Ea Nuol) in the two districts of Cu M'gar and Buon Don respectively (treated as one study area).
2. wet rice cultivation in Bong Krang commune, Lak district
3. mixed upland agriculture in Dak R'Tih commune in Dak R'Lap district in the south-western corner of the province

The final selection of three communes was preceded by pilot studies and fieldwork in coffee producing areas.[19]

A basic assumption was that the different agricultural practices—coffee growing, wet rice cultivation and mixed upland agriculture—would illustrate the reasons behind the stresses and risks, and identify how those affected are avoiding setbacks, building resilience and taking action to ensure a sustainable livelihood.

It should be noted that health conditions are not a focus of this study, although it is well known that the loss of one main labourer (due to chronic illness or death) in a household greatly affects

19 The second district of the coffee area, Buon Don, is part of the statistics and the references but not described in detail.

the capacity of that household to not only recover from stress, but also to maintain their livelihood under 'normal' conditions (PTF, 2002).

Education is also not a focus of this study. However, we acknowledge that educational background (especially for women) is a decisive factor in the degree of access to information and training, in turn having a bearing on the capacity to cope with issues related to both production and reproduction. During household interviews, we did ask questions about literacy rates, children's school attendance and availability of school rooms and teachers.

We did discuss gender differences and their consequences when relevant to the major effects of the stresses/risks and coping strategies. However, gender considerations have not been a focus per se. Further studies should be done on causes and effects of different outcomes for men, women and children. This is particularly important for differences in resource tenure. For example, Kinh communities are patrilineal and patrilocal, yet some ethnic minorities are matrilineal and matrilocal. What happens, for example, when a predominantly matrilineal community, in the case of this study the Ede and M'nong ethnic groups, encounter and mix with the Kinh patrilineal system?

Data collection took two main forms:

1. Interviews with:
   - individual farmers (men and women, usually in their homes)
   - village, commune, district and provincial officials
   - representatives of the mass organisations (mainly Women's Union, Farmers' Union and Youth Union) at these same levels
   - staff from different provincial departments such as DARD and Department of Nature Resources and Environment (DONRE), and their corresponding offices at district and commune level
2. Collection and review of secondary information such as GOV policy documents, provincial, district and commune reports, village head reports, statistical books and reports etc. References are also made to books, (foreign aided) project reports and official documentation and statistics by the World Bank (WB), International Monetary Fund and UNDP.

In total, 140 households were interviewed (Table 5). About half were classified as 'poor' (*ngheo*) and the rest 'average' (*trung binh*) and 'better-off' (*kha*), according to the local authorities' classification. We deliberately biased our household selection towards poor and indigenous peoples' households in order to better understand the relationship between poverty and vulnerability in times of great change.

Locally, the 'poor' are those who do not have enough food (rice) for a certain number of months per year. Often people in this group either have limited or no land for cultivation and therefore subsist by working seasonally on other farmers' land. The 'average' group does not normally lack food and can manage, but without secure surpluses. The 'better-off' have a surplus every month for saving and investments. This is general for all three study areas although the local criteria may differ somewhat.

Table 5. Number of interviewed households, income and ethnic groups

District	Commune	Village	No of HHs	Income group		Ethnic group
				Poor	Average and better-off	
The coffee area						
Cu M'gar	Chu Sue	Sut M'gru	15	6	9	Ede 14 Kinh 1
Buon Don	Ea Nuol	Thon 3	19	8	11	Dao 19
		Ea Nieng 1 + 2	17	6	11	Ede 7 Kinh 10
		Ea M'thar	22	13	9	Ede 16 Kinh 6
Area Total			73			
The wet rice area						
Lak	Bong Krang	Buon[20] Dak Ju	16	10	6	M'nong 16
		Buon Thai	9	4	5	Thai 8 Muong 1
		Buon Ma	13	10	3	M'nong 13
Area Total			38			
The upland area						
Dak R'lap	Dak R'tih	Thon 6	23	10	13	M'nong 23
		Thon 7	6	6	-	Tay 6
Area Total			29			
Total			**140**	**73**	**67**	M'nong 52 Ede 37 Dao 19 Kinh 17 Thai 8 Tay 6 Muong 1

The interviews, prepared in advance in the form of checklists, were semi-structured. A participatory approach allowed for open-ended questions in which the interviewees felt free to elaborate on issues important to them, while at same time they were guided through the checklist by the interviewer. Sometimes, Participatory Rural Appraisal (PRA) tools were used such as mapping and drawing to illustrate environmental conditions, land use, habitation and location of poor households and their level of income. While the interviews were preceded by a more formal meeting attended by the local official, most of the household interviews were conducted with no official present. Generally, the open and relaxed atmosphere of the interviews allowed for serious discussion about forest depletion, water deficiency, intensive coffee growing and alternative income generating activities suitable to the cultivation traditions of both Kinh, migrant ethnic minorities and the indigenous Ede and M'nong. The interviews also addressed sensitive issues such as access to land and its management and the GOV response to trading of land.

The fieldwork took place for six weeks in November and December 2002 following a one-day training by the SEI researcher for the interview team. After each field visit the team held work sessions to compare collected data and prepare for the next visit. All interviews and work sessions, including the training, were held in Vietnamese.

20 Buon here is the word for village. In translation the villages are thus called Dak Ju, Thai and Ma. Thus Buon Thai literally means 'the village of the Thai people', indicating that the village was formed by the migrant Thai from the northern part of Vietnam. However, in this study we keep the prefix 'buon'.

4 Village study results

4.1 INTRODUCTION

In this section we describe the changes that took place after 1975[21] in each of the three dominant agricultural land use areas (Figure 12), the impacts and issues arising, and finally the relationships between these impacts and issues.

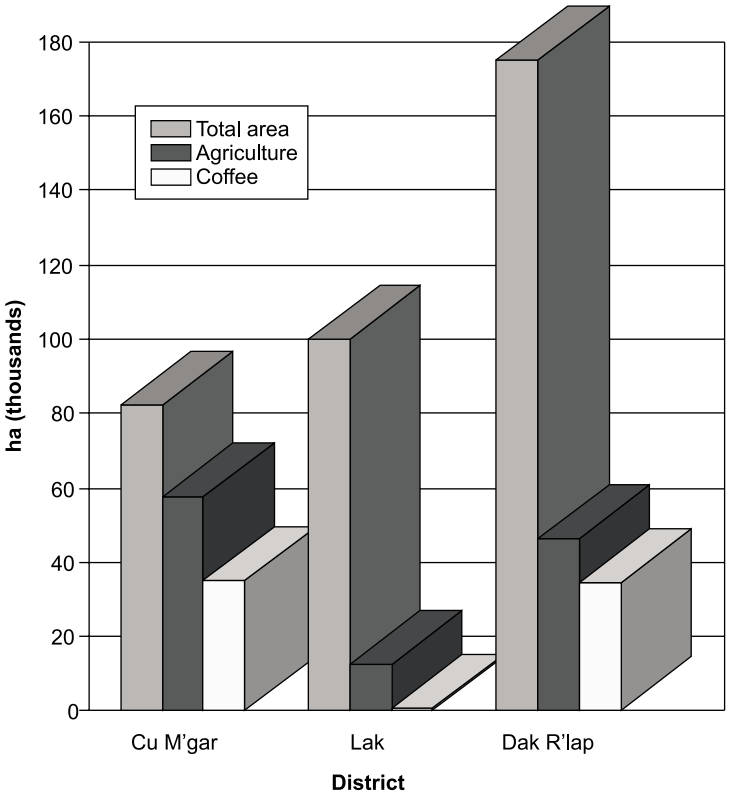

Figure 12. Land use in three surveyed districts: 2002 (Source: Dak Lak Statistical Yearbooks)

4.2 CU M'GAR DISTRICT: COFFEE AND LIVELIHOODS

With its strong focus on coffee during the 1990s, in many ways Cu M'gar District reflects the rapid changes in environmental and social conditions occurring in Dak Lak Province as a whole. We chose Cu Sue commune to study the changes in detail because the benefits and risks facing these small farmers growing a commodity for the global market are typical of the district. This case study looks at the impacts of coffee price fluctuations on vulnerability (see Table 6 for a summary).

In 1975, the commune consisted of four villages with about 3,000 inhabitants, all of whom were Ede. According to commune officials, by 2002 there were 10 villages and 9,800 inhabitants comprising 4,500 Kinh, 3,700 Ede and 1,600 Dao peoples.

21 1975 marked the end of the American war and the first stage of development efforts in a unified Vietnam (the official unification took place in July 1976).

By the late 1970s, the natural forest area had largely been lost to commercial logging and agricultural expansion. Until the 1980s, Cu Sue residents relied on a variety of agricultural and forest products. Forest land provided NTFPs or supported swidden crops including dry rice, beans and maize. Common grazing land supported livestock such as buffalo, cattle, goats and pigs, which represented an important source of savings for households. Statistical records indicate that the approximately 1,000 hectares of forest remaining in 1990 were gone by 1995.

By 2002, almost the entire area of Cu Sue was under cultivation. Coffee production began to expand throughout the commune in 1986 and by 2002 accounted for 70% of the total cultivated area and formed the livelihood basis for most people. Households grew an average of one hectare of coffee each; however, some households had only a few coffee trees in their home gardens, while 17 households had more than five hectares. Nearly all households (90%) have received Land Use Certificates (LUCs). However, not all land is controlled by commune residents. Nearly 200 hectares are managed by the Ea Pok State (coffee) Farm, 230 hectares by the April 30 State Rubber Company and another 400 hectares of coffee land is 'encroached upon' (*xam canh*) by people outside the commune (most of whom are residents of Buon Ma Thuot).

In 2002, 25% of the commune households were poor, 65% had an average income, and 10% were classed as better-off.[22] According to commune officials, the poor households are mostly those who had either sold their land or lacked the capital to invest in fertilisers and other inputs to maintain the productivity of exhausted soils.

The broad influences of in-migration and transition to coffee cultivation vary somewhat among villages within Cu Sue according to differences in the villages' history and their residents. We visited the villages of Sut M'gru and Thon 3 (Box 6). The relevant differences between these villages include the wealth of the communities, attitudes towards the sale of land of each community's majority ethic group and the length of time that the village has been established, the size of plots available for cultivation, level of investment in water resources, and use of forest resources. Many other aspects of livelihoods affected by the integration of coffee in the two villages are broadly similar.

22 Figures passed to the study team by the commune authorities.

Box 6. Two coffee villages: Sut M'gru and Thon 3

Sut M'gru village

This primarily Ede community (60%) has been settled along the banks of Ea Trum stream for a long time. The Kinh residents mainly migrated here during the 1980s and 1990s. Another 26 Kinh households arrived in 2000–01 and are still waiting for permanent registration. There are 189 households with a total of 1,435 people. It is estimated that nearly 20% of households are poor,[23] most of which are Ede households. These households lack rice for up five to six months a year and also have inadequate housing and other basic needs.

The traditional livelihood of the Ede communities involved cultivating rice and other food crops in a rotational swidden system. In this area, however, commercial forestry and agricultural expansion had removed the forest cover by 1978. Like other villages in the area, these households now depend on other cultivation practices and livestock raising. Cattle were a traditional source of income, as well as a kind of insurance and form of savings among the Ede communities. However, the number of cattle declined considerably during the 1990s following conversion of grazing land into cropping land for coffee and other crops.

A common source of income for Kinh households is trading in fertilisers and insecticides. These people also often serve as a substitute for the few agricultural extension advisers and provide credit in the form of private loans. These loans are often a more commonly accessible alternative to public bank loan systems which require Land Use Certificates. These traders are commercially oriented and their interest may be to encourage over-consumption of chemicals rather than to give impartial advice. In addition, the loans provided by them are higher than publicly available loans and often directly connected to the value of the produce at harvest, making farmers totally dependent on both inputs as well as outputs.

The level of involvement with coffee cultivation has intensified over the last 15 years. In 1985, people were organised into settlements and each household received 1.5 *sao*[24] of land to build a house and garden. Coffee trees were often planted in these gardens. A year later, coffee expansion started with an initial 31.6 hectares in all. By 2002, the area under coffee had grown to 166.5 hectares and covered more than half of the village's area. In 2002, while most households had only 0.2 hectares of coffee or perhaps even smaller amounts planted in the homegarden, the largest coffee farm covered nearly four hectares. The individual plots of land are relatively small, so those wanting to grow more coffee have to spread it over several plots. This fragmentation makes it more difficult to take advantage of economies of scale in coffee investments. The average yield is 1.5 to 2 tonnes dry beans per hectare, with most coffee sold at the farm gate to traders. Some farmers have also become involved to a limited extent with rubber production. This alternative cash crop was introduced by the government. The rubber trees are planted by farmers on their own land. The 30 April Rubber Company supplies farmers with seeds and fertilisers and pays for the (seasonal) work and rubber collected.

While coffee cultivation has taken over a great deal of land, every household has a small piece of wet rice land. This is only for self-subsistence, but is not enough for a full year, and most households have to buy additional rice.

Thon 3

In Thon 3, of 142 total households, 122 are Dao, 13 are Kinh and seven are Nung (migrants from the north). In contrast to other migrant ethnic groups from northern Vietnam, the Dao settled in Dak Lak as early as 1954 and brought coffee growing skills with them. When Thon 3 was established in 1976, there was still dense forest supporting precious timber. In 1982, six households organised a coffee production area of six hectares. Since the introduction of the LUC in 1994, there has been no migration into the village. The Dao people in particular tend to keep their land rather than selling it. If any trade of land occurs, the tendency is for it to be purchased by Thon 3 residents.

About 10% of the households are classified as poor (11 of which are Dao, three Kinh and three Nung). It is estimated that 70% of the households are 'better-off', corresponding to an income of over VND 50 million (3,500 to 4,000 USD) in 2000. While the income was reduced to about VND 30 million per year in 2001 and 2002 when coffee prices went down, it is still regarded in the area as high.

Today almost all land is used for coffee and the rest for wet rice cultivation. The size of the coffee area per household varies. The largest farm that we came across was 10 hectares; a more common area is one to three hectares, while coffee grown in the homegardens makes up the smallest units (usually less than 1 hectare).

See also Annex 4 for details.

23 In this case defined as earning less than VND 80,000 (about USD 5) per person per month, according to Vietnamese standards for the year 2000.

24 One sao corresponds to 1,000 square metres.

Challenges to sustainable livelihoods

Heavy investments required for coffee cultivation

Coffee is perceived to give high returns; however, it also demands significant investments. The initial investment includes buying the seedling trees, planting and fertilising them, and often constructing basin walls around the trees to hold water close to the roots. According to growers in Sut M'gru village, trees should be irrigated three to four times a year and provided with 3 to 3.5 tonnes of fertilisers per hectare. People we interviewed estimated that the average costs of water and fertilisers are VND 12 to 16 million per hectare and year for one coffee growing household. The specific patterns of investment varied largely with household assets, income levels and ethnicity, as well as individuals' personal strategies. For example, some preferred to maintain a diverse set of livelihood options while others were more willing to take on risks, such as debt. In order to invest in coffee, households had to use assets that would make them more vulnerable to the price fluctuations and drought that came later. Farming households often converted forest land, wet rice, mixed dry crop and grazing land to coffee, as well as taking out substantial loans from public and private sources in order to finance annual and longer term water resource investments.

From the early days of coffee, existing patterns of poverty and affluence influenced the pattern of adoption. Cash cropping has favoured the Kinh ethnic groups, who are more experienced in cash cropping, including mobilising resources and knowledge, than the indigenous people. The latter are more used to cultivation for subsistence with free access to forest and land. Modern cash cropping demands good knowledge of written Vietnamese and general schooling in order to keep up with the technical requirements and the necessary market information. Good spoken skills in Vietnamese help farmers participate in social networks in order to negotiate profitable sales arrangements. The better off and average income groups (who are most often dominated by the Kinh ethnic communities) have the capacity (capital, know-how and experience) to invest in cash cropping, make full use of existing land and even sometimes improve soil quality. In addition these groups have the resources to purchase more land.

Poor farmers who decide to invest in coffee faced additional challenges in obtaining profitable yields because their land holdings are generally lower quality. Over previous years of land trading and development, poor farmers have ended up with poorer quality soil and with difficult access to water resources. In addition, their plots are smaller with the result that they cannot provide sufficient collateral for bank loans and often turn to more expensive private sector loans. Neither can they take advantage of economies of scale to improve soil quality or develop wells and irrigation systems. The more limited assets restrict annual spending on necessary fertilisers, resulting in decreased productivity.

Conversion of forest cover

As early as 1978, records indicate a decline in the area of natural forests; thus this transition was not driven entirely by coffee. While approximately 25% of land in Cu Sue district was forested in 1990, by 1995 the remaining forest areas were gone. The reasons are a combination of opening up of forest areas through commercial logging, agricultural expansion and later, during the 1990s, the expanding coffee plantations.

The losses in biodiversity that accompanied the conversion of forest were substantial. This loss affects all segments of the population, although it was only commented upon by the Ede communities. These indigenous peoples had to give up their traditional free access to the forests and their products which had been used in multiple ways, especially when other sources of income fell short. In addition to dry crop cultivation, these lands were also used for hunting, fishing, collecting wood and firewood and numerous different NTFPs such as plants for food, fodder and medicine.

In addition, the loss of tree cover may be one reason for lowered water levels.

Reduction of grazing land

Converting land to coffee production has also reduced grazing areas for livestock, primarily cows and buffaloes. Livestock have also been sold to build up investment capital for coffee plantations. The sales of livestock were an important change in the finances of Ede households. The livestock were both a form of savings but also a source of securing access to capital. Without the grazing land, it became increasingly difficult to invest in livestock. The alternatives are private loans and bank loans that the Ede farmers regard as much riskier. The phasing-out of livestock also reduced the availability of dung, an important natural fertiliser.

Increasing debt

Nearly all households have borrowed money to invest in coffee. Usually, the size of the loan is relative to the size of the coffee land area. Growing one hectare of coffee generally requires a loan of about VND 16 million or about USD 1,000. However, that amount rose to VND 20 million in 2000 and dropped down to VND 10 million in 2001, reflecting variations in water and fertiliser prices as well as reluctance to invest when profit is low or losses high. Most poor farmers turn to private lenders who do not require any collateral. Many of the interviewees in Sut M'gru (14 out of 15 of whom are Ede), reported that they borrow money 'on the free market'. In fact these private lenders are traders who buy the coffee and sometimes also supply fertilisers. In this system, the farmers are in debt to the suppliers at an interest rate of 65%. There is no formal crop insurance system.

All of the 125 better-off households in Sut M'Gru have taken loans from the Bank for Coffee Production. Sums vary from 2 million to 100 million VND. Since 2000, when coffee prices fell dramatically, few households have been able to repay their debts. During our study, no borrower (of any category) had been able to repay his or her bank loan. We were informed that the bank had agreed to postpone repayment, but it was not clear for how long and under what conditions. The debts are so large and so common that it has even become a provincial state policy to delay payments.

Overdependence on coffee

Farmers reported that the potential profits from coffee led them to invest more heavily in one crop than they had in the past. Potential profits also provided an incentive for farmers to attempt to grow coffee in poorer soils where the risk of low returns was greater. The relatively high coffee prices[25] of the 1990s saw the expansion of coffee into unsuitable areas. As coffee became a monoculture, the previous diversification of food and cash crops declined. Even among the poor groups, the belief in coffee was so strong that the local commonsense principle of 'not putting all your eggs in the same basket' was abandoned. This reduced diversity in livelihood strategies has increased households' exposure to coffee price shocks as well as increasing their sensitivity and reducing coping alternatives.

During the early to mid-1990s, coffee prices steadily climbed; however, in the late nineties they began to drop and in 2000 they fell steeply. According to local farmers, coffee was suddenly only worth one-tenth of its earlier value (from VND 40,000 to VND 4,000 per kg of dry coffee). The main reason was, as explained by the farmers as well as the local authorities, Vietnam's dependence on world market prices.

25 Highest prices in the areas were VND 50,000 per kg, falling to below VND 4.000 per kg in November 2002. It was generally acknowledged that break-even is at VND 10-12.000 per kg (see also Oxfam, 2002).

When coffee prices are low, many farmers, and in particular the poor farmers, do not have sufficient resources to make appropriate investments in water and fertilisers to keep the coffee plants in good shape. This in turn is leads to low yields and the poor farmers become trapped in a vicious circle.

While all income groups were affected by price falls, the better off and average farmers could fall back on capital accumulated during the good times. Among these groups are typically Kinh households, but also some Ede and the migrant Dao group in Thon 3. As they were usually the first farmers to grow coffee, their trees were mature and they could take advantage of the good prices. They could afford to maintain their coffee plants through the low price periods, instead of cutting them down as many poor farmers did. The poor farmers did not have these buffers and they had a much weaker basis of production and thus limited resources for coping.

Water resource competition and scarcity

As coffee has become more common, there is increasing competition for water in the region. Access to water is a matter of concern because it is vital both for coffee plantations and for wet rice production. Most coffee plantations are in the hilly and upland areas in the upper reaches of the catchments. Water required for coffee is often diverted from other food crops, particularly wet rice. This has affected the wet rice cultivation areas in the lowlands. While wet rice cultivation is far from the dominant agricultural activity in the coffee area (covering only 4% of land), it is still an important food store for personal consumption. This is a deep rooted practice among farmers. Even local authorities grow their own food, despite having the money to buy rice.

It has become more difficult and expensive to get enough water for coffee plants, particularly during drought years. In Sut M'gru there hasn't been enough water for growing coffee every year since 1995. The groundwater level has reportedly sunk every year and today wells have to be at least 30 metres deep in order to supply sufficient water. Competition for water among households and crops has increased and access to sufficient water demands further investment.

Competition for water mainly affects poor farmers who can't afford to buy water and/or rent equipment for pumping water. Poor farmers often start with land that is already short of water. Ability to efficiently invest in water pumps is slightly better in Thon 3 where landholdings are concentrated, with 1 or 2 wells serving an entire coffee field. Poor farmers usually do not have enough land to grow other crops to supplement the rice yields that are declining because of lack of water. The scarcity of water means that only one crop of wet rice can be harvested per year and this is usually not enough for household subsistence.

Droughts and floods

Competition for water becomes more pronounced in drought years. Droughts affect all the major crops: coffee, wet rice, and so-called dry crops, such as maize, beans, and tubers. Coffee and wet rice are the most sensitive to drought. District staff reported that in a severe drought as much as 50% of the wet rice crop may be lost. They observed that the droughts appeared to be more frequent and severe in the 1990s.

Severe droughts have occurred at regular intervals (1994–95, 1997–98 and 2000–01). During the heavy drought in 1995 all farmers (across all income groups) were hit and each had to pay VND 250,000 per 12 m^3 of water to save their coffee plants. In addition, to hire irrigation equipment could cost up to VND 40,000 per hour. In order to improve the availability of water there is a plan in Sut M'gru to upgrade the Ea Trum reservoir to a capacity of 323,000 m^3.

Farmers believe that replacing forest with coffee plantations has resulted in more frequent flooding in recent years, causing losses to wet rice. Chu Sue commune lost 80 hectares of wet rice (43% of the total wet rice area) in 2000 and 41.5 hectares in 2002 to floods. The Thon 3 village leader also reported losses of wet rice in 2000 and 2002 corresponding to about 50% of the total yield.

The relative impact of droughts and floods is greater when coffee prices are low as wet rice yields are also sensitive to these calamities. Thus both sources of food and cash income decline, and this is made worse by the fact that low income groups no longer have access to NTFPs because of forest removal for coffee.

Declining soil fertility

Coffee is very demanding of soil nutrient resources and maintaining soil quality requires regular inputs of fertiliser. Because grazing land has been converted and most of the cattle sold, farmers are forced to buy fertiliser. Farmers are concerned about the perceived decrease in soil quality. Before intensive coffee cultivation began, the life of a coffee tree was estimated to be 40–60 years. In 1992, local farmers estimated that it had fallen to 20–25 years due to the shift from natural dung to chemical fertiliser which exhausts the soil. In addition, access to fertilisers depends on the farmers' income and ability to make purchases. If the crop is not good one year, there is less money to spend on fertiliser the next year. Consequently, as coffee prices fell over number of years, many farmers were unable to replace and augment soil fertility.

Farmers classed as better off and average are less affected by soil deterioration because they have diverse livelihood strategies, including growing a range of crops (rice, coffee, maize, sugar cane) and small livestock breeding, as well as trading in strategic goods, such as fertilisers and water.

The land issue

While the higher coffee prices led to increases in land prices, when coffee prices fell, farmers with savings tended to increase their land holdings, while poor farmers were tempted to sell their land in the hope that a cash income would help them to improve their livelihood.[26] They also thought that they could not compete with the successful coffee growers. The trade in land continued after the coffee boom; this time as a result of failed investments and losses, again mainly among the poor. To become landless is a particular trauma to a farmer whose land is the basis for his\her livelihood. Also, living off one's own rice production is considered fundamental to farmers.

Another phenomenon in the studied villages is the tendency of non-village residents to buy and manage coffee land while living elsewhere. The competition for good quality land and the continued concentration of land are causing poor groups to lose their land and become seasonal labourers for successful farmers. Thus increasing food insecurity, loss of income and land followed the coffee expansion and the sudden fall in coffee prices.

Adaptation to change

In 2000, the combination of reduced coffee prices, lack of water, and deteriorating soils led a number of farmers to replace their coffee trees with food and other cash crops. In interviews with residents of Sut M'gru, nine out of 19 reported that after 2000, they chopped down all or some of their coffee plants and replaced them with (hybrid) maize. In 2002, 31 hectares of coffee were replaced with maize and beans. This happened mostly on land belonging to the Ede community. Today, as a kind of coping strategy, many farmers are intercropping the coffee with crops like durian for the first three years of the coffee tree growth. However, poor farmers are at greater risk as their investments are destroyed and they do not have adequate capacity (capital and know-how) to invest in other crops.

26 This in spite of the fact that the current Land Law does not allow trade in land. This is hidden under the official expression 'transfers'. In fact, commodification of land is a strong trend generally in Vietnam and in practice a real estate market is underway, although not yet officially recognised.

Table 6. Adaptation to changes by farmers and local institutions in Cu M'gar district

Changes	Adaptation	
	Farmers	**Local institutions (mainly plans)**
Changes in environmental conditions - Changing climate, more frequent and extended droughts (1995, 1998, 2001, 2002) - Floods due to more short and heavy unexpected rainfalls - Erosion: when cultivation is done on sloping land - Landslides	- Digging deeper wells - Constructing reservoirs - Buying water for the coffee trees - Choosing rice varieties of short duration (100 – 120 days) to avoid impact of floods. - Digging hollows around the coffee trees to keep water and planting trees to prevent erosion. - Planting trees around the coffee for shade and wind breaks.	- Forest plantations - Expansion of irrigation systems and flood control - Technical advice on cultivation of coffee and other crops - Structural change of tree plantations
Rapid changes in land use	- Better off farmers largely maintain their coffee plantations - Poorer farmers try to change for other crops or sell or lease their land	- Long term land use planning - More careful analysis of soil quality and capacity - Improved extension advice
Forests seriously depleted	No special action related to the depletion. It is largely accepted as a fact.	- Earlier efforts to restore the forest by tree plantations failed, as a result of continued destruction of forests for coffee plantations -Trials with re-forestation are going on
Considerable reduction of grazing land for large livestock (cows and buffaloes)	No special action related to the loss. Dung is replaced by chemical fertilisers although dung is much preferred	No particular plans to increase the number of livestock as all attention has been reserved for coffee plantations
Expansion of coffee plantations onto land unsuitable for coffee. Coffee turning into a monoculture	- Maintain the coffee trees (often by increasing existing debts) although they produce low yields - Switch to other crops such as beans, maize and sugar cane - Leave land fallow and take jobs as seasonal labourers	The provincial authorities' original plan of 70,000 ha was later revised to 170,000 ha based upon known available water resources. During the coffee rush the area rose to 264,000 ha. There are plans to turn 40,000 ha of coffee land over to other crops
Scarce and declining water resources lead to competition between crops	The farmers prefer to keep both coffee and rice, but accepting lower yields in rice if (the highly water-demanding) coffee can be maintained.	- Planned water reservoir in Ea Nuol was not built as it would reduce a wet rice area by 25%. - Most irrigation systems were built for the state coffee farm
Rapid changes in coffee prices. Ex: in 2000 the value of coffee was 1/10 of the value in 1999 (from VND 40,000 to VND 4,000/ kg)	- Better off and average farmers set up stores of coffee in order to level out the peaks and falls in prices - Diversification (but maintaining coffee trees). Poor farmers are combining coffee with other crops or switching entirely to other cash crops - Some farmers started breeding pigs and chickens	- Diversification is the main solution to the dependency on world market - Authorities started campaigns to breed small livestock (pigs and chickens) - Local and national coffee companies could act as a buffer between the farmers and the world market - The state has a policy to purchase coffee as a reserve to maintain the coffee prices for the coffee exporters - Taxes were reduced or relieved - Attempts to reduce the robusta coffee and increase the Arabica coffee
The quality of the soil is deteriorating	- Maintain the coffee trees (often by increasing existing debts) although they produce low yields - Switch to other crops such as beans, maize and sugar cane - Leave land fallow and take jobs as seasonal labourers	- Long term land use planning - More careful analysis of soil quality and capacity - Improved extension advice

Changes	Adaptation	
	Farmers	**Local institutions (mainly plans)**
Level of investment is reduced when coffee prices are low, leading to lower yields	All income groups have taken the initiative to cut down coffee trees (partly or totally)	No specific plans other than encouraging poor farmers to diversify or totally stop growing coffee in unsuitable areas
Cutting down the coffee trees – costs are high and alternatives are not clear	Seeking alternative cash cropping such as maize, beans, sugar cane but without formal advice or extension	Authorities prefer to lead the change of land use. They are reporting about plans to balance monoculture with diversification

Adaptation to change concerns the direct impact of the introduction of coffee as a (monoculture) cash crop. Meanwhile more fundamental changes in livelihood conditions have taken place as reflected in table 7. Adaptation turns into agency in face of new (seemingly irreversible) conditions of the livelihoods.

Table 7. Changes in livelihood conditions and agency (farmers and local institutions)

Livelihood conditions	Agency	
	Farmers	**Local authorities (mainly plans)**
Increased investment capacity – increased coffee yields. Level of coffee yields directly related to investment capacity: land, capital (for fertilisers and water) and know-how of each household (HH)	- Better off and average farmers maintain high levels of water and fertiliser input. - Poor farmers abandon the use of fertiliser and at best keep watering the coffee plants	- Expansion of the irrigation system and control of water - Expansion of extension services in coffee growing
Size of land holdings affects investment capacity	The poor farmers are selling or leasing their land to the more successful farmers	-
Large loans taken during the coffee boom (1995–1999) cannot be paid back	Farmers appreciate the delay in re-payment, hoping that the value of coffee will rise again thus allowing them to repay. They might be able to pay it back from other production. Poor farmers cannot easily get out of the debts from private lenders.	The banks have prolonged the time for repayment. The authorities have reduced the taxes for farmers in debt
Trade in coffee land increases land prices	Most farmers try to keep their land, being aware of its relative value. However, the poorest strata lose out.	No particular action. Whether the government plans to officially recognise a real estate market is not yet known.
Indigenous peoples sold land to migrants and non-residents	Farmers, in this case the indigenous peoples, went elsewhere to clear new land (if available) or become seasonal labourers for other farmers.	Local authorities are purchasing land to hand over to the farmers who have lost land. Alternatively, authorities are trying to find ways of stopping farmers from selling their land.
Competition for land in general and for land of good quality in particular has increased.	Poor farmers loose land and become seasonal laborers on other farmers' land.	Local authorities are purchasing land to hand over to the farmers who have lost land. Alternatively, authorities are trying to find ways of stopping farmers from selling their land.
Paddy production yield per capita decreased between 1995 and 2001, leaving an increasing number of people dependent on non-rice income generating activities.	Many farmers, especially the poor farmers, use all means to stick to their land.	Generally, the authorities hope that farmers will get used to relying on non-rice income generating activities and trust that the market can supply sufficient quantities (and quality) of rice.

Livelihood conditions	Agency	
	Farmers	**Local authorities (mainly plans)**
Changes in land management since 1975 favour farmers and non-residents who are experienced in producing a surplus (rather than self subsistence, normally the aim of traditional farming techniques or dry crop rotation by the indigenous).	No particular action, but the changes in land management (from userfruct rights, to collectively managed, then to privately managed) is a big change for indigenous peoples.	- Since 1994, the vast majority of farmers have LUCs. And efforts are being made to ensure that all farmers have LUCs. - Where farmers are still using dry crop rotation techniques this land does not normally have an LUC.
Poor households falling into permanent poverty	- Poor farmers sell or lease out their land and become seasonal labourers. - They become permanently dependent on state support.	- The state has calculated that 1 ha of coffee or 0.5 ha of dry rice land or 0.25 ha of wet rice land should be sufficient to feed one household of common size. - Authorities are resettling poor households to new areas with land for housing and cultivation.

The broad differences between poor and better-off farmers in their adaptation to and agency to remedy short and long term impacts of changes in livelihood conditions are reflected in table 6 and 7. Looking specifically at their respective responses to coffee price fluctuations, a distinct pattern of differential vulnerability emerges (table 8).

Table 8. Differential vulnerability between poor and better-off coffee farmers: responses to price fluctuations

	Better-off farmers	**Poor farmers**	**GOV intervention**
When coffee prices increased	Assets are converted to coffee production from grazing land, forest, dry agriculture land, wet rice land. Incomes rise relatively for all farmers		-
	Land bought from poor farmers	Sold land for two reasons: 1.Land value became higher 2. Production not feasible due to lack of investments	-
	Accumulated assets form basis for overcoming emerging water scarcity	Water scarcity and lack of other investments made increasing income unsustainable	-
When coffee prices fell	Largely maintained the coffee plantations, albeit with less investments (water and fertilisers)	Declining income led to declining investments leading to further declines in productivity	Technical advice on cultivation of coffee and other crops
	Started intercropping coffee with other cash crops	Chopped down the coffee trees for annual cash crops (e.g., maize)	Encouraged reduction of coffee plantations to suitable areas
	Stored coffee	Some land was put back into food production, other land was sold.	Bought back land for poor farmers
	Debt of bank loans increased. Less capacity to pay back.	Increased debt to private lenders; more cattle and land sold.	Temporary debt relief for farmers with bank loans
	Cut down on hired labour force	Difficult for labourers to find job	
	Water resources exhausted; decline in soil quality; Increase of flood and drought frequency turned down rice production.		Expansion of irrigation systems and flood control. Forest plantation.

See also Annex 1 for an overview of the linkages between the risks (events or changes), their causes and effects, response from local authorities and farmers, and impacts on different income groups.

4.3 LAK DISTRICT: RICE INTENSIFICATION

Lak District is in the south-east corner of Dak Lak, about 50 km from Buon Ma Thuot. It covers 108,000 hectares and in 2001 the population was 49,000, 65% of whom were minority ethnic groups. About one-third of the district is covered by mountains and hills, most of which are forested. Most livelihoods are agricultural, mainly wet rice cultivation. The importance of other crops is limited. The flat lands where wet rice is grown are frequently damaged by floods. Average income is therefore low and most farmers are regarded as poor. This case study examines the impacts on vulnerability of local government attempts to intensify wet rice production (see Table 7 for a summary).

Box 7. Wet rice cultivation in Bong Krang commune

The landscape of this commune is characterised by large flat areas of land separated by steep mountains. Forming a bridge between the high and low land, the hills are covered by forest and scrub. About 5,200 people (800 households) live in the 11 villages of Bong Krang commune; 85% of the households are M'nong, an ethnic group indigenous to the area. Other residents are migrant Kinh, Thai and Muong groups who mainly arrived in the early 1990s. Nearly 35% of households were classified as poor in 2002.

Although traditionally the M'nong communities farm rotational swidden fields (Luu and Vorpahl, 1997), in Bong Krang these communities have grown wet rice for generations. Another feature is that the 1,300 hectares under cultivation are a fraction of the commune's total area (31,600 hectares). About half the cultivated area is set aside for wet rice. On average, a household has access to about 0.2 hectares of cultivable land. Other crops grown are maize (local varieties and hybrids) and cassava. Nearly 90% of households have received a LUC.

Unlike the typical wet rice areas in Vietnam, such as the Red River and Mekong River Deltas, forested mountains and hills cover most of the commune. A district-level State Forest enterprise has allocated over 7,000 hectares of forest land to three communes. Bong Krang, one of the three, received 2,700 hectares in 1996 and each household manages 30–40 hectares on average. This forest is in the buffer zone of the Chu Giang Sinh National Park which means that there are restrictions on forest use; for example cutting trees is not allowed. The forest is used for extracting NTFPs such as bamboo shoots, medicinal plants and rattan.

Although coffee is considered unsuitable in this area, 50 households grew coffee when prices were high (1995–1999). In 2002 less than half the households were still growing coffee, most often using their homegardens as scattered plantations. Livestock raising, especially cows, is a traditional method for saving.

See also Annex 5 for details.

We conducted interviews in three villages in the commune: Dak Ju, Buon Ma and Buon Thai. The two adjacent villages of Dak Ju and Buon Ma rely on wet rice cultivation, while Buon Thai is more recently established and less traditional in its land use systems.

Established before 1900, Buon Ma is inhabited by the M'nong (R'lam) who traditionally grew rice in rainfed fields. There are 99 households, of which three are Kinh who migrated from central Vietnam in the 1990s. Most of the households are regarded as poor by the local leaders, whose definition is based on the number of months per year when there isn't enough rice. In Buon Ma, many households lack rice for up to six months a year. Yet some rice fields produce six tonnes per hectare, a figure regarded as high by the commune authorities. Commune and village leaders contend that the village's focus on growing wet rice for subsistence and not sale explains their poverty.

Cu M'gar coffee district (photos: Eva Lindskog)

Mother and child

Some families maintain their traditional weaving skills

Head of Ede clan drinking traditional rice wine

Head of Ede clan

Poor Ede farmer

Ede couple in traditional clothes

Better-off Kinh farmer and trader

Better-off Dao farmer

Bronze drum orchestra

Dao farmer (left) on her coffee farm with Kinh labourer

Coffee fields

Better-off Ede farmer's house

Wet rice land, Lak district (photos: Diep Dinh Phong)

Head of village and his wife

Wet rice fields

Plan for clean water delivery

Cattle is an important part of the livelihood

Gardening

Upland area, Dak R'lap district (photos: Diep Dinh Phong)

Wet rice and dry crops

Wet rice, pepper and other crops

Trials to allocate forest to households

Swidden fields

Less successful coffee growing

Of the 200 hectares cultivated, 60 hectares are under wet rice. Since irrigation is limited, most fields are rainfed. According to the commune, if Buon Ma had a proper water supply about 40 hectares could produce a second crop every year. Before 1977, when the fields produced only one harvest per year, floods were not a problem. Once two harvests per year were introduced by the commune authorities, flooding and landslides started to cause damage because of cultivation during risky periods. For example, in 2000, the village lost 40 hectares, nearly 70% of the rice fields, affecting almost all households. In 2001, a scarcity of irrigation water prevented 20 hectares from being cultivated. In response to these losses, upland fields have been exploited for cassava plantations. Rather than taking out bank loans, villagers prefer using the traditional forms of saving for investments and unforeseen expenses, such as breeding cows.

Another important source of subsistence and income is collecting NTFPs. Almost all of the 29 households interviewed in Buon Ma and Dak Ju collected bamboo shoots and fuelwood. On average, it is possible to collect a 15 kg back basket (*gui*) of bamboo shoots per day. Selling dried bamboo shoots for VND 5–10,000 per kg or fresh for VND 400–700 per kg is a relatively good income. However, according to the village leader this is not a sustainable practice as bamboo shoots are declining near the village, forcing farmers to travel further to gather the same amount. The increased travel costs lower the income to that of a normal seasonal labourer's wage, VND 15–20,000 per day (about 1 US$).

Additional income-generating activities include collecting and selling cow dung (earning VND 5–8,000 per day for the farmer) and fishing in nearby Lak lake. A third alternative is forest protection work for the State Forest enterprise.

Compared to the two M'nong villages, Buon Thai village is a new settlement. It was established in the early 1990s by migrant Thai and Muong households from Thanh Hoa Province in northern Vietnam. In 2002 the 32 households combined wet rice cultivation, homegarden products (pepper, cashew, beans) and upland cash cropping (maize and cassava) using unsustainable pioneering agriculture techniques. The farmers living in Buon Thai have a larger area of cropping land than their neighbours in Buon Ma and Dak Ju. Another difference is that farmers in Buon Thai often borrow money (up to VND 10 million) from the bank, indicating that their produce is for sale (and not only for subsistence). Buon Thai has more better-off households than the M'nong villages, where just a couple of households are labelled better-off. Also, the better-off households in Buon Thai are relatively wealthier than their counterparts in the M'nong villages.[27]

Challenges to sustainable livelihoods

Natural disasters

As in the coffee plantation area, floods and droughts occurred frequently between 1995 and 2002 in this commune. Farmers and local authorities think the disasters increased in strength and frequency during this period and climate data at the provincial level confirm this. Both local authorities and farmers attribute this to global climate change and increasing human pressure on natural resources, especially forests. They also suspect that decreasing forest cover is lowering water levels and drying out the watersheds. However, floods are generally seen as normal and something that farmers have to live with.

Wet rice cultivation is very sensitive to both floods and droughts, especially in the villages in Lak District where there is generally no irrigation system. In Bong Krang commune, floods and droughts usually destroy up to one-third or even half the yearly yields. In addition, in 2000 a major landslide shut down the irrigation system. Our field data show that poor farmers are most vulnerable

27 Before the GOV introduced the national measure of income levels, localities defined 'better-off', 'average' and 'poor' in different ways.

to natural disasters since they rely on small plots of land and have few income alternatives. While natural disasters also affect the better-off farmers, both M'nong and migrant Kinh groups, their plots are often scattered over a wider area and contain a variety of crops, making them less vulnerable than poorer farmers.

Tension between traditional and modern approaches

According to farmers we interviewed, the shift from one to two rice harvests per year was the largest transformation to occur in their villages, a change many M'nong farmers did not welcome. They were reluctant to intensify their rice cultivation because they did not need a tradable surplus. They also thought that a second harvest would increase their rice fields' vulnerability to floods. Before the introduction of two wet rice crops a year in the mid-1990s, M'nong farmers did not accumulate any debts during the wet rice production cycle. At that time one crop per year was sufficient and there were no inputs in the form of irrigation or fertilisers. They subsisted on rainfed cultivation and on forest products of different kinds. The M'nong we interviewed explained that that they are not interested in two crops, even if they have to live without wet rice for several months a year. They are not comfortable with the techniques necessary for producing two crops, such as using draught animals, and they don't like to be in debt for buying fertilisers. Spiralling debt has been the consequence for large groups of the M'nong community who were unable to adjust to the general policy of growing two wet rice crops a year.

Despite this view, the district authorities are planning to improve irrigation on 136 hectares in Buon Ma using canals and pumps.

This emphasises two essentially different points of view: the farmers desire a balance between different sources of income as well as between investments and what nature offers (as they have done traditionally), rather than forcing natural resources to increase yields at high human and natural costs. The district authorities feel that farmers just need information and training so they can understand the advantages of modern techniques.

There are few options to expand agriculture into cash cropping. Attempts to grow coffee in the area have largely failed and according to the farmers only maize and cassava are suitable on the sandy soils of this area.

Debt in unripe paddy

A relatively new phenomenon in Buon Ma is 'selling the unripe paddy' (*ban lua non*). A lack of investment capacity (capital for fertilisers, equipment and know-how) to compete with the neighbouring Kinh, Thai and Muong households, leads many farmers (about 50%, according to the village leader in Buon Ma) to sell the paddy while it is still growing. The system is actually a kind of a loan from the Kinh traders in the form of fertilisers. At harvest, the farmers have to pay back nearly double the original loan value. For example, a farmer who borrowed VND 80,000 would have to pay back 100 kg of paddy at harvest, equal to VND 120,000 to VND 150,000. If farmers cannot pay just after harvest, the price will be 200 kg of paddy one year later.

According to the district authorities, this system is acceptable if people do not go hungry. Though not starving, many farmers in Buon Ma (and Buon Dak Ju) are trapped by this system into a cycle of impoverishment. To avoid this situation, some households have chosen to grow cassava and maize instead of rice.

Forest exploitation

Like the Ede communities in the coffee area, the M'nong ethnic groups in Lak district have traditionally combined forest resource gathering with livestock breeding and growing wet rice. The

dependency on forest resources for dry crop cultivation, fishing, hunting and collecting NTFPs, ensured that indigenous peoples protected the forests. As long as uncontrolled cash cropping and migration were not an issue, there was also no competition for forest resources. Life in the forest was comparatively sustainable. Under these conditions shifting cultivation and other traditional use of forest products are not detrimental to the recovery of forest resources, as shown by a number of studies in Vietnam (Salemink, 1998; De Koninck,1998; Do,1994).

This balance was upset in the three case study villages by the emerging state and individual logging activities, trade in wildlife, in-migration of other ethnic groups such as the Kinh and Thai, and unclear use rights.

All forest is managed by forest enterprises which means that to most local people forest has no 'master' (chu). This unclear 'ownership' is increasing the opportunities for illegal use of the forest and opening it up to logging and pioneering shifting cultivation. This is all threatening the M'nong communities who have their own community approach to forest management.[28]

However, forest conversion in Lak district and in the three villages is far less destructive than in the Cu M'gar coffee district, where no forest is left.

As latecomers, the Thai groups did not have access to cultivable land, which was already mainly managed by the M'nong communities and the migrant Kinh groups. The only option was to use the forest. However, the M'nong farmers we interviewed in Bong Krang worry about the dry crop cultivation techniques practised by the Thai and Muong groups. The M'nong feel they are unsustainable because the migrant groups open up new land for cultivation by burning forest on sensitive sloping land. The migrants also continue to use the land without any fallows and plough the slopes, further aggravating the environmental problems. The M'nong's argument is supported by observers such as De Koninck (1998), who argues that these 'pioneering agriculture techniques' are unsustainable. Also, the unsustainable use of the forest has led to increasing difficulty in finding NTFPs for consumption and sale, and hunting and fishing were also reported to be less productive.

Marginalisation of M'nong women

The M'nong community is traditionally matrilineal, which means that inheritance is through the female line and women have a strong and often influential say in everyday matters as well as in strategic decisions. The society is also matrilocal, which means that after marriage husbands move to live with their wife's family.

There is not yet any research into what actually happens to the gender relations and division of power and influence within small communities such as the M'nong as they undergo major changes. However, there are studies (Tay Nguyen 2001) that show that M'nong women are ignored in development efforts such as changing farming techniques, individualising land ownership and training. In their push to 'modernise' farming techniques and administration practices, local authorities most often turn to the men in the M'nong communities. Their assumption is that in common with the traditional Kinh patriarchal system, men are the household heads and take the important decisions.

This undermines M'nong women's self-esteem and the collective as a whole loses valuable and important knowledge and the capacity for maintaining and improving their livelihood systems.

28 However, customary land management has not yet been legalised, although it is discussed by Vietnamese and foreign scholars (eg. Sikor, 2000 and Tran et al., 2001). Salemink (2000) proposed an official recognition of customary laws in Vietnam and in the Central highlands in particular, as research has shown that communities that have been 'able to maintain their local regulatory systems have much better capacity to deal with the changes and uncertainties'.

This is important in regards to institutional knowledge and coping capacity; if women are being marginalised this could weaken the resilience of the community as a whole.

Adaptation to change

It seems that one adjustment strategy is for the M'nong communities to uphold a kind of 'double' regime: a patriarchal regime externally, when relating to societal affairs; and a matriarchal internal regime guided by the age-old transfer of knowledge and meaning along the female line. Thus the external regime is an adaptation to the dominant norm where the head of household is a man and where land is allocated to households and not to communities. While the internal regime is still upheld by the M'nong communities, it is under threat.

Table 9. Adaptation to changes in climate and nature conditions by farmers and local institutions in Lak district

Changes	**Adaptation**	
	Farmers	**Local institutions (mainly plans)**
Changing climate; floods and droughts more frequent (1998, 2000, 2001, 2002) usually destroying up to 20% of the cultivated area, corresponding to 1/3 or ½ of the annual yield; in 2000 there was a major landslide from nearby mountains destroying the irrigation system	Poor farmers (88% of whom are indigenous peoples of the M'nong ethnic group) regard the state support as insufficient and turn to better off Kinh HHs to 'borrow unripe rice'.[29] About 50% of farmers follow this system.	- Expansion of irrigation systems - In disaster years the state has supported farmers with rice seeds (on average 10 kg per HH) and sometimes rice for consumption.
The rise of coffee prices between 1995 and 1999 affected the area, but not to the same degree as compared to the Upland Area	- Farmers started the coffee plantations spontaneously and also switched to other crops when the coffee made a loss. - Cash cropping in other crops and diversification into VAC[30] models are new remedies.	- Introduction of other cash crops such as maize, cassava, sugar cane and cacao. - 5 agricultural models have been introduced aiming at diversification. Introduction of other cash crops such as maize, cassava, sugar cane and cacao. - 5 agricultural models have been introduced aiming at diversification.

Changes in climate, nature conditions and land use in the wet rice area are relatively limited (in particular as compared to the coffee area). However, policies to intensify the wet rice cultivation have put pressure on the indigenous M'nong farmers resulting in their increasing debt relationship to migrated farmers with capability and tradition to achieve two rice harvests per year.

29 In a never-ending circle the poor farmers borrow in kind (sometimes in cash) before the harvest. At harvest time (usually after 3 months) they have to pay back in paddy with an interest of 20%. If they pay back one year later, the interest rate is 50% or the double value of the original debt.

30 V – vuon (garden); A – ao (fishpond); C – chuong (stable).

Table 10. Changes in livelihood conditions and agency (farmers and local institutions) in Lak district

Livelihood conditions	**Agency**	
	Farmers	**Local authorities (mainly plans)**
The 'borrow unripe rice' system is increasing dependency and depriving poor farmers of opportunities for saving.	-	-
Producing for a market is not yet an option for poor farmers with small plots and low yields in wet rice cultivation.	The poor farmers make use of traditional sources of income such as keeping livestock as capital and turn to the forest for non-timber-forest products (NTFP) such as bamboo shoots for sale.	-
The introduction (after 1975) of two wet rice harvests per year is not an option for poor farmers.	Because of the frequent droughts, farmers keep to one harvest per year in order to avoid risks.	- Expansion of irrigation - Establishment of agricultural models
Local M'nong traditions are not considered when state allocates support affecting the balance of influence between men and women.	-	-
Considerable areas have infertile soils.	-	Projects have been introduced to support farmers in growing trees such as cacao and longan.

Differences in social groups in the wet rice area are mainly taking the form of degree of capability (and tradition) to grow two harvests per year.

Table 11. Differential vulnerability between poor and better-off farmers: responses to intensive wet rice cultivation in Lak district

	Better-off farmers	**Poor farmers**	**GOV intervention**
Traditional reliance on extensive farming and use of forest resources	Both categories of farmers were relying on extensive wet rice cultivation that was supplemented with upland cultivation, livestock raising and collections of NTFPs.		-
Change to intensive farming and cash cropping	Better-off farmers can make use of two wet rice crops per year.	Poor farmers stick to one wet rice crop per year but get into debt to the better-off farmers.	Support to irrigation systems in order to expand two wet rice crops per year. Occasional support to poor farmers when in food insecurity.
	Better-off farmers tried coffee plantations but failed (largely as natural conditions were not suitable). Coffee was replaced by other cash crops such as maize, cassava, sugar cane and cacao.	Mainly due to lack of land (few plots) and the design of the irrigation makes diversification hard to achieve.	Support to diversification in form of agricultural models.
	M'nong farmers in particular prefer the traditional extensive system as they believe that intensive farming is not suitable to the area and causes further environmental damage.		-
Gender implications of new farming techniques	The introduction of intensive farming does not consider changes in power relations within the M'nong households to the detriment of the women's influence and decision-making.		-
Migration	M'nong farmers, traditionally relying on forest resources, lose their livelihood base. Migrant farmers are overusing (mining) forest resources.		Limit use of forest resources.
Climate change	Increased frequency of floods makes wet rice cultivation a more risky practice.		

See also Annex 2 for an overview of the linkages between the risks (events or changes), their causes and effects, response from local authorities and farmers, and impacts on different income groups

4.4 DAK R'LAP DISTRICT: FOREST DECLINE IN THE UPLANDS

This case study explores responses to diminishing forest resources and population increase in an upland district (for a summary see Table 8). Dak R'lap District is in the south-west of the province. It is the largest district, and with about 74,000 people the population density is relatively low (42 people per square km, compared to 180 in the coffee district of Cu M'gar). Over half of the district is covered with forest, while about 25% is classified as agricultural land. Five forest enterprises and a number of other forest related companies operate in the district, between them managing at least 70,000 hectares.

Between 1995 and 2002 about 12,500 hectares of forest were converted to agricultural land for wet rice and cash crop cultivation.

The main livelihood source for the M'nong communities, the main ethnic group in this district, is upland dry crop cultivation using slash-and-burn techniques combined with hunting, fishing and collecting NTFPs (see Box 8). We studied two villages in this commune: Thon 6,[31] traditionally a M'nong village; and Thon 7, established in 2000 by migrant Tay groups from the northern Cao Bang province.

Box 8. Mixed upland cultivation in Dak R'Tih commune

The commune's landscape is dominated by mountains and forests. The population is 3,600, 80% of whom are indigenous M'nong, distributed among 15 villages. The other groups include migrant Tay and Nung peoples from Cao Bang province in the extreme north of Vietnam. There are also a few Kinh households. Nearly 50% of households are classified as poor, and these include the recently arrived Tay migrants (in 1996).
Almost all households have received LUCs for land management, except those practising dry rice cultivation on swidden fields.

The total area of the commune is 14,300 hectares, 800 of which are cultivated. About 11,800 hectares are forest, predominantly natural forest managed by the Quang Tan State Forest Enterprise. The Enterprise has allocated about 1,000 hectares of this forest to 100 households. Each year each household can use 6% of the forest area; after 15 years it will belong to them. They are allowed to collect NTFPs and cut trees selectively, a trial activity led by the district. Activities also include models for planting bamboo for producing bamboo shoots and planting fruit trees under the forest canopy.

Nearly 20% of Dak R'Tih commune's total area comprises swidden fields managed on rotation. These fields are used for dry rice, as well as coffee and cashew nut trees. Another 2,300 hectares of land officially classified as agricultural land include rubber (900 hectares), coffee (700 hectares), wet rice (100 hectares), cashew nuts and black pepper. The soil is generally considered to be good for coffee, and people in a nearby commune, Quang Duc, have seized land (xam canh) here for coffee growing.

Wet rice cultivation is relatively new[32] in Dak R'Tih and few of the M'nong communities have adopted it. Interviews with M'nong farmers revealed that they do not feel acquainted with intensive cropping techniques. Besides, to get an acceptably high yield out of the two crops would demand major investments in irrigation. Yields are low from the two crops a year mainly grown by the Kinh migrants. For them one harvest per year is not enough and many efforts have been made to introduce a second spring crop.
See also Annex 6 for details.

31 Some of the background information on Thon 6 is partly derived from a Vietnamese report (TNU, 2000) about a forest allocation model implemented through cooperation between the villagers and authorities at all levels (district, commune and village).

32 It was introduced in 1976 but did not appeal to the M'nong communities in this area and thus remained insignificant until the arrival of the Kinh groups and other migrants.

Thon 6 used to be called B'Nor. During the war the villagers had to evacuate several times. In 1976 they finally settled in the village, now named Thon 6, under the Fixed Cultivation and Sedentarisation Programme. All of the 73 households are M'nong, apart from two recently-arrived Kinh families who are local traders. The M'nong depend on the forest for their livelihoods: for swidden cultivation of rice and other crops, building material, game meat, NTFPs and fish.

Officially, swidden areas are not included in the village statistics, but village leaders of the Dak R'Tih commune estimate the swidden fields to total 150 hectares. The official figures for Thon 6 give a total cultivated area of 64 hectares, which includes 20 hectares of lowland cultivation (mostly wet rice) and about 40 hectares of residential land, including homegardens. The rest is used for livestock grazing. The swidden fields are used for dry rice growing but also for cash crops such as coffee, rubber and cassava[33] and the homegardens very often include coffee trees together with fruit trees and vegetables. LUCs are only issued for the 'official' cultivated area of the village (in this case the 64 hectares) and not for the swidden fields.

Thon 7 is different from Thon 6 in several ways: it is new, officially established in April 2000, and consists of migrant Tay groups who have been arriving since the late 1980s. In 1996 there were 53 households altogether. During the coffee boom, 26 households moved to Cu Jut District in the hope of better luck. Still, many of the remaining households hope they can improve the coffee cultivation and hope to receive forest land in the same way as the neighbouring M'nong in Thon 6. So far, none of them has received an LUC, although there are 12 hectares of lowland wet rice as well as homegardens.

In contrast to the M'nong, the Tay practise pioneer agriculture, cultivating and ploughing the same area continuously without fallow periods. Their yields of coffee, rice, cassava, maize and beans are low, and M'nong farmers comment on the poorer farming techniques used by the Tay. Interviews also indicate that both forest and soil are deteriorating. The Tay supplement their livelihood by collecting NTFPs and working on other farmers' land.

Coffee growing in the studied villages has not been successful despite the soil being suitable. This is mainly due to farmers' lack of resources such as water and fertilisers. Almost all households tried growing coffee during the boom. When the prices fell, the better-off and average farmers in Dak R'tih lost the most as they had made relatively large investments with loans from the bank. The poor farmers on the other hand had limited losses due to the small investments they had made.

Rubber has also been tried out but it is quite a new activity (since 2002). It may give work and income for the poor groups. Wet rice (introduced in 1976) was always a subsidiary crop and was never grown intensively except by the Tay who are now getting two crops a year.

Challenges to sustainable livelihoods

As we discussed earlier, although traditional rotational swidden is not detrimental to the environment per se (Do, 1994 and ADB, 2001), natural population increase, in-migration and the expansion of cash cropping coffee are putting pressure on the system (TNU report, 2000; and Gender Issues Report on Thon 6, 2001). These changes were also highlighted by the farmers in the household interviews.

Natural disasters

In this upland commune floods have limited impact. However, droughts in 1997 and 2000 destroyed about one-third of the wet rice crops and the coffee plantations but did not affect the dry crop

33 In this case the cassava is cultivated as a cash crop for raw material supply to a company producing sodium glutamate.

rotation areas because they occurred after harvest. There is a general view among the interviewees that the natural disasters have increased in frequency and magnitude since the middle of the 1990s. They also assert that during the last ten years the dry season has become hotter and the rainy season colder.

The losses that occurred affected mainly the better-off farmers and the recently-arrived Tay people, who tend to concentrate on wet rice and coffee.

Introduction of cash cropping

While the M'nong communities in Dak R'Tih commune insist that dry cropping in swidden fields is most suited to upland conditions and to their experience and capacity, local authorities perceive these techniques to be unsustainable and are trying to replace them with 'modern' methods of growing coffee and other cash crops.

The introduction of coffee has attracted migrants and non-residents into this remote area. Previously unknown, the sale of land has become an issue. Strong pressure during the 1990s to expand the coffee plantations led the commune and Thon 6 to sell 50 hectares of village land to a coffee company. Another 50 hectares were sold to different Kinh groups, increasing the '*xam canh*' phenomenon. These events have negatively affected the indigenous peoples who are losing their traditional areas of cultivation.

Also, the spontaneous growing of coffee in homegardens and on dry crop rotation fields made farmers vulnerable when the coffee plantations failed. All groups of farmers were affected, but the impact on the poor farmers was heaviest as they do not have the capacity to switch to alternative crops due to lack of know-how and investment capital. When coffee cultivation expanded onto sloping land it caused erosion. This affected the better off farmers (mainly the Kinh) who could afford to cultivate this kind of land. M'nong farmers commented that they would never use this kind of land since they are aware of the risk of erosion and landslides.

Forest exploitation

The earlier extensive logging by the State Forest Enterprise in the area, coupled with continued illegal logging, has depleted the commune's forest resources. In addition, forest is cut down for coffee plantations (mainly by the Kinh) and for pioneering agriculture (by the recent Tay migrants).

The TNU report (2000) emphasises that it is not the indigenous M'nong peoples who are destroying the forest; instead they depend on it for their continued livelihood. The report points out that the Forest Enterprise (in this case Quang Tan) has limited capacity to control events. The management vacuum exposed the forest to intrusion from outside, especially when the first coffee plantations were established in 1988. According to the report, forest cover was reduced from 85% in 1960 to 78% in 1994. Household interviews also indicate that after the intensification of the coffee plantations in 1998, when practically all households invested in coffee in the upland fields, the forest was badly affected.

The M'nong communities complain that the Tay migrants are exploiting the forest because they do not know how to practise dry crop rotation techniques properly.[34] With the recent in-migration, wild animals and other endangered species (flora and fauna) are being harvested much more than before. Professional hunters and collectors now operate in the forest. The M'nong people also hunt

34 The area of upland fields is reported to be about 150 hectares in Thon 6. Farmers usually cultivate the same plot for three to five years, followed by a fallow period of 10 years. Under these circumstances, in order to let the trees and vegetation recover there is, however, a need for a much bigger area, about three times the existing one, according to interviewed farmers.

and collect NTFPs, but according to them they do not use 'mining techniques' and ensure they maintain biodiversity for future use.

Social impact

A PRA welfare ranking[35] done in 2000 in Thon 6 by a Tay Nguyen University team (TNU 2000), classified 60% of households as 'average', nearly 20% as 'better-off' and only 20% as 'poor' and 'hungry'. Considering that most outside observers assume that upland agriculture is the main reason for permanent poverty (eg. TNU 2000), these results are remarkable. Also, only two out of the 23 households interviewed for this present study reported yearly 'lack of food'.

This is in contrast to the Tay households in Thon 7 which are all considered to be poor. Being relatively recent migrants and not experienced or resourced enough for cash cropping, the non-indigenous ethnic groups rely on the unsustainable use of the forest. They also turn to seasonal labour when at risk of hunger. Comparing welfare levels, these are poorest groups of the three.

While traditionally the M'nong could survive quite well and even accumulate resources through their customary livelihood system, the arrival of migrants has upset the system. Under pressure from the demands of intensive cropping methods and declining forest resources,[36] many M'nong households have decided to move their dry crop rotation fields further away from their villages. This means that the farmers have to stay out in the fields for longer and under more difficult conditions. Housing and sanitation are basic, there is no means of transport for people and goods and no extra labour to take care of the children. Children have to accompany their parents to the remote fields, making it very difficult for them to go to school.

Impact on women

A TNU gender analysis in 2001 shows that the workload of both men and women has increased since the introduction of forest allocation (that also includes training in new technologies) and cash cropping, especially coffee. Traditionally men do 'heavy work' such as extracting logs, sawing timber, house construction, hunting, select forest for the swidden fields, inspecting allocated forest, pruning, digging holes for the coffee trees etc. They also take part in meetings and other village affairs. Women do the 'lighter work': taking care of children; housework, including collecting fuelwood, NTFPs and water; homegarden work; small livestock breeding, etc. Women's time constraints do not allow them to get further information and training, or to do anything for themselves. Traditions (women do not automatically take part in meetings and training sessions) as well as unfamiliarity with the Vietnamese language are holding women back.

Adaptation to change

Forest protection

In an effort to protect the forest, a cooperative scheme between the state and the farmers started in 1999. Thon 6 was selected as a model in Dak Lak or allocating 1,016 hectares of existing forest among the households. The contract was signed in groups of 10 to 16 households with the local Forest Enterprise, Quang Tan.[37] Our household interviews revealed strong support for 'getting back

35 Better-off household described as: good house, upland fields, lowland fields, coffee growing, livestock, good health, motorbike, TV, cultivation equipment and tools. Average: as above except no motorbike, perhaps TV. Poor: fairly good house, access to above agricultural resources but less, bad health, old age, small children, lacking labour, no motorbike or TV. Hungry: Small and simple house, living in isolation, no labour, nor motorbike or TV.

36 Good quality soils in upland fields are increasingly rare, and are becoming increasingly distant from habitations and sources of water.

37 There is no indication in the TNU report of the timeframe of the contracts or when the model will be evaluated.

the forest'. Also, the degree of participation was high when farmers (the real experts) were invited to take part in the analysis of three different types of forest:

1. forest used for swiddening from three to seven years
2. forest that has recovered from swiddening after 20 years
3. old growth forest used for selective logging for more than 10 years

According to the farmers' analysis, the first category should never be used for swiddening; the second category was the right one to use and the last category was accepted for swiddening if situated along rivers and streams but never on the upper part of a mountain. The research also looked at what kind of NTFPs were exploited from each of the three categories and for what purposes. The household interviews in this study also confirmed the long and varied list of NTFPs[38] that are consumed or sold. (TNU, 2000).

Table 12. Adaptation to changes in climate and nature conditions by farmers and local institutions in Dak R'lap district

Changes	**Adaptation**	
	Farmers	**Local institutions (mainly plans)**
Droughts occurred in 1997 and 2000; the latter destroying 25% of the wet rice crop and 30% of the coffee crop. The dry crop rotation areas were not affected as harvests had taken place before the droughts.	While the impact of droughts and floods is generally considered to be low, farmers are happy with their tradition of using dry crop rotation techniques.	In 2000 the Dak R'Lap district gave support in form of irrigation equipment (2 water pumps).
Forests are threatened by uncontrolled logging, and in-migration by Kinh and Tay ethnic groups who clear land for coffee (Kinh) and dry rice rotation growing (Tay).	- Farmers are taking initiative to protect the forest on HH basis. - Some farmers (10 HHs) are taking part in a project to manage about 1,000 ha of forest	Models are established for protecting the forest by allocating forest land to the indigenous peoples for their management.
Indigenous peoples rely heavily on **NTFPs that are threatened with extinction**	-	Local authorities are trying to introduce intensive cropping methods (rice, rubber) in order to create a more sustainable income for the farmers.
Wildlife and biodiversity are threatened by extraction of wild animals for sale.	-	-
Cultivation on sloping land is causing erosion and loss of soil.		

Generally, due to the continued reliance on the forest, the farmers in the upland area are less affected by natural disasters. Only when the forests are threatened by outsiders, is the sustainability of livelihoods a matter of concern. Changes in livelihood conditions include mainly issues related to the rotation cultivation techniques and to what extent the indigenous peoples are given the opportunity to develop a sustainable approach to these techniques.

38 Fruits, roots, game (first category of forest); rattan, different kinds of bark, fruits, bamboo, bamboo shoots, game, honey, fish (second and third category). Other NTFPs also include medical plants and mushrooms as listed in a Gender Study in Thon 6, by the same Social Forestry Support Programme group members at TNU (2001).

Table 13. Changes in livelihood conditions and agency (farmers and local institutions) in Dak R'lap district

Livelihood conditions	**Agency**	
	Farmers	**Local authorities (mainly plans)**
The spontaneous growing of coffee in home gardens and on dry crop rotation fields led to losses in income.	-	Introduction of extension in coffee growing techniques.
While **dry crop rotation cultivation** (mainly rice) is the most important source of income for the indigenous peoples, **cash cropping** (coffee and rubber) is increasingly competing with the traditional land use pattern in the area.	-	- No particular support for dry crop rotation cultivation. - Intensive cultivation is encouraged.
The spring rice crop is producing low yields (about 1 ton/ha).	-	- The state is supporting farmers with rice seeds every year. - There are models to support the farmers
Dry crop rotation fields situated in remote areas (10 to 15 km way from the village).	No remedy. The farmers believe they are very dependent on this kind of technique, which is the basis of their main income.	-
The efforts to **restrict the indigenous people's tradition of using crop rotation techniques** will have a negative impact on people's daily life.	When limitations occur, farmers bring their rotation fields into even more remote areas.	-

When it comes to vulnerability and the different social groups, in the uplands there is a clearer distinction between long-term dwellers (the indigenous peoples) and the new-comers (or migrants) than between different income groups. Besides, the differentiation between income groups is strongly related to the capacity to take on cash cropping something that is still quite new to the farmers in the upland area.

Table 14. Differential vulnerability between poor and better-off farmers: responses to intensive wet rice cultivation in Dak R'lap district

	Better-off farmers	**Poor farmers**	**GOV intervention**
Traditional reliance on extensive farming and use of forest resources	Both categories of farmers are relying on extensive dry crop cultivation, livestock raising, hunting, fishing and collections of NTFPs. Generally the long term settlers (the M'nong communities) regarded this as sustainable as long as there is no competition for the forest resources. This is also proved by the comparatively higher living standards in the M'nong village (Thon 6) than the migrant Tay village (Thon 7).		-
Loss of forest resources	No major impact on better-off farmers as they do not rely wholly on forest resources.	The two categories of poor farmers responded differently: - M'nong farmers withdrew further into dense forest areas. - Tay farmers rely on (devastating) pioneering agriculture.	Trials with allocation of forest land to farming households.
Migration and population increase	M'nong farmers, traditionally relying on forest resources loose basis of income. Migrating farmers are overusing (mining) forest resources.		Limitation of use of forest resources.
Change to intensive farming and cash cropping	- Better-off farmers can make use of the intensive farming techniques. - Better-off farmers changed to mainly coffee and rubber plantations.	- Some farmers became poorer when they sold land to better-off farmers. - Poor farmers stick to extensive farming based on forest resources.	- Support to irrigation systems in order to encourage intensive farming. - Occasional support to poor farmers when experiencing food insecurity.

	Better-off farmers	Poor farmers	GOV intervention
Gender implications of land use change	Land use changes and the introduction of intensive farming do not consider changes in power relations within the M'nong households to the detriment of the women's influence and decision-making powers.		-
Climate change	- Better-off farmers were affected by the frequent droughts and floods that hit the lowlands and slopes where the cash cropping is dominant. - Better-off M'nong farmers are not affected as their farming takes place in the uplands.	Poor farmers were marginally affected, as most of their farming takes places in the uplands.	-

See also Annex 3 for an overview of the linkages between the risks (events or changes), their causes and effects, response from local authorities and farmers, and impacts on different income groups.

5 Concluding remarks

This study, as outlined in Section 2, was structured around several hypotheses:

1. A specific locality is affected by stressors emanating from all levels, including the global level.
2. There are differences in vulnerability between localities.
3. There are vulnerable people within all groups and under all conditions.
4. Diversification reduces vulnerability.

Our findings verify all four hypotheses. The research presented here answers some specific questions about vulnerability to multiple stresses at a particular time in Vietnam's recent history and in a particular (dynamic) region.

The path to a sustainable pattern of development is not smooth. Like other environmental and economic management challenges, sustainable development requires an adaptive management approach to learning and responding to uncertainties and emerging challenges. In Dak Lak, much of the impetus for adaptive management came from the interactions among climate variability, new agricultural opportunities and population growth through migration. Although each of the three studied districts/communes of Dak Lak experienced something of the stresses and opportunities posed by the rapid investment in coffee, the vulnerability at the commune and village level differed significantly among them. While the dramatic nature of the rise and fall of coffee fortunes and, by association, of those centrally involved in growing coffee has captured most of the popular attention to the region's difficulties, the differences in degree of exposure experienced, the sensitivity to the stresses, and the resilience of livelihoods involved multiple stresses that interacted differently at local levels.

In this final section we explore some of the strategies which helped people adapt to change, and make some recommendations for supporting these strategies in the future.

5.1 SUCCESSFUL ADAPTATION STRATEGIES

Households

What factors and strategies helped people cope with change in our study areas? Differences in wealth status and cultural background contributed to differences in the losses experienced by social groups practicing similar patterns of farming. At the same time, in areas where coffee was not an important cash crop, such as in the uplands, local people living in the area for generations (in this case the M'nong communities) experienced no or fewer losses as their livelihoods were not directly affected by the rapid changes in environmental and economic conditions. In addition, relying on farming techniques well known to them made them also less sensitive to these changes while at the same time they were also deprived of the opportunities of cash cropping.

We found that higher levels of education and market experience gave greater success in cash cropping endeavours. Migrant Kinh did better at growing coffee and coped better with the price drop. While this needs to be investigated further, it is likely to be because of their knowledge of and experience in cash cropping, their social networks, and their close relationship with local institutions.

When coffee prices fell, most households still had some land to use for food production. This is an in-built strategy within Vietnamese culture (including those of minorities): 'I keep some land for rice, not only for myself, but also for coming generations'. This is the case even for 'white collar' workers. Wet rice is considered the best and most rational way of growing food. The severity of loss of land needs to be understood within this context. Poor people in coffee areas were forced to sell their land, as this was their only option, and hope that the government would help them later.

Although the mixed upland area of Dak R'Tih grew as rapidly in migrants and coffee as Cu M'Gru, people in these more diverse contexts seemed to cope the best with change and were generally less sensitive. There is still considerable forest to fall back on, although biodiversity is being depleted. Change led them to pursue even more diverse livelihood strategies, including coffee, which now plays a big role. The area as a whole seems capable of balancing resources, food and income. But there are internal differences.

Poor people in upland areas are less sensitive than poor people in the other two areas. People in the mixed uplands currently seem able to deal with existing stresses, without increasing their level of poverty. However, they have been able to cope with the situation at a price: loss of biodiversity and long term resource transformation (cutting forests). Some people, such as the M'nong, move deeper into the forest. Some groups (i.e. indigenous peoples) use forest in a sustainable way, others (newcomers) do not, applying pioneering agriculture. Anyhow, the diversity within current livelihoods has allowed people to cope with the stresses of preceding years without more people falling into poverty; whilst the forest is sufficient.

The diversity in options has changed. Whilst ecological diversity has certainly declined, a former narrow local livelihood diversity (with limited land use and income earning possibilities) has widened (more options available, but with fewer land use options, going from the local to a wider institutional safety net). Now people start intercropping with coffee, and cut down coffee for other crops when prices decline. Smallholders sell land, with rich people generally holding coffee buffer stocks and rely on capital built up earlier when prices were better.

Policy

Local changes in policy to the changing context were evident. Local government responded well to the increasing stress: banks were told to give a grace period on loans, to introduce exemptions

from paying interest on loans and freezing/extending unpaid loans. The authorities allowed new credit, encouraged or arranged for coffee buffer stocks, and issued regulations on coffee quality and minimum prices for export coffee. Coffee farmers got reduced, or were relieved from, agricultural taxes. A campaign was introduced to reduce the area of *robusta* coffee and increase the area of *arabica* coffee, and to set a limit on the coffee plantation area and encourage other cash crops.

The government has done less for wet rice (except for providing replacement seeds and food) and upland areas, but plans to do more. Most government interventions are more available to the better-off farmers, while the poor so far have had less capacity (or willingness) to absorb the new policies of relying on the market forces for sustainable livelihoods. The main constraint for the poor is the lack of alternatives to the current changes. This has widened the divide between social groups. For instance, the government has done little to prevent the further encroachment of upland cultivation and forest areas by outsiders.

5.2 FOOD FOR THOUGHT

Allowing the indigenous peoples to catch up

Experience from many development projects in Vietnam has shown that eagerness for quick economic development often leaves indigenous and ethnic minority peoples lagging behind. For these groups there are suddenly a number of new systems, skills and competencies that they must learn and master quickly. Examples are systems for land tenure, for wet rice and/or cash crop production, investment arrangements for these systems, and knowledge and skills in handling credits and markets. Given the conversion of land uses and the level of investment, some people found the change in livelihood irreversible. People who were formerly practising swidden cultivation in the coffee area said ‘we would like to go back, but we can’t. There is no forest left’.

In order to respect and absorb existing local traditions, knowledge, and competence in production and village management, there is often a need to extend the current planning and decision process to lower levels and rely on both traditional and government village head systems as well as on existing mass organisations and associations. In addition, this would assist in developing alternative livelihood systems. Such a strategy could help overcome the inequalities that are now apparent between ethnic groups.

This study shows that one crucial key to sustainable livelihoods is to find the balance between the preservation and accumulation of tangible and non-tangible assets and its distribution between different social groups and to establish mechanisms so as to let local people explore alternative livelihoods suitable to them.

Further research

The research also raises some important issues which require further investigation, especially:

- how have gender relations been affected by these economic, environmental and social changes?
- how have the social networks of different ethnic groups contributed to differences in the success of coping strategies?
- how have changes in land use and increased competition over water contributed to the need for new institutional mechanisms for resource management?

References

ActionAid Vietnam (2003). *Dak Lak. A Participatory Poverty and Governance Assessment (PPGA)*. Mimeo. Hanoi.

ADB (2001). *Participatory Poverty Assessment, Lao People's Democratic Republic*. Asian Development Bank.

Adger, WN., Kelly, PM. and Nguyen HN. eds. (2001). *Living with Environmental Change: Social Vulnerability, Adaptation and Resilience in Vietnam*. Routledge Research Global Environmental Change. London.

Adger, WN., Kelly, PM., Winkels, A., Luong QH. and Locke, C. (2002). Migration, remittances, livelihood trajectories, and social resilience. *Ambio* 31:4, June 2002.

Ahmad, A. (2000). *An Institutional Analysis of Changes in Land Use Pattern and Water Scarcity in Dak Lak province, Vietnam*. Department of Economics, University of Lund. Paper presented at the Nordica Conference on 'Institutions, Livelihoods and the Environment: Change and Response in Mainland Southeast Asia', Copenhagen, 27–29 September 2000.

Bao H., Nguyen HN. and Tran HN. (1999). *Community Forestry Management in Central Highlands – Vietnam*, Case study report, Mimeo, Buon Ma Thuot.

Beckman, M. (2001). *Extension, Poverty and Vulnerability in Vietnam. Country Study for the Neuchatel Initiative.* Overseas Development Institute (ODI) and Swedish University of Agricultural Sciences (SLU), Working Paper 152. October, 2001. Uppsala.

Burton, I., Kates, W., and White, GF. (1978). *The Environment as Hazard*. New York: Oxford University Press.

Carney, D. (2002). *Sustainable Livelihoods Approaches: Progress and Possibilities for Change*. Department for International Development (DFID), London.

Chambers, R. and Conway, GR. (1992). *IDS Discussion Paper 296*. Sustainable rural livelihoods: practical concepts for the 21st century. Institute for Development Studies, University of Sussex, Brighton.

Dang, NA. (2003). Internal Migration Policies in the ESCAP Region. *Asia Pacific Population Journal,* September 2003.

Dang, TH. and Shively, G. (2004). Coffee boom, coffee bust, and smallholder response in Vietnam's Central Highlands. *Review of Development Economics*, December, 2004.

De Fontenay, P. and Leung, S. (2001). *Managing Commodity Price Fluctuations in Vietnam's Coffee Industry*. National Centre for Development Studies, Australian National University, Canberra (www.ncdsnet.anu.edu.au)

De Koninck, R. (1998). *Deforestation in Vietnam*. International Development Research Centre (IDRC). Canada.

De Koninck, R. (2000). The theory and practice of frontier development: Vietnam's contribution. *Asia Pacific Viewpoint*, 41:1.

DFID, (no date). *Sustainable Livelihoods – Building on Strengths*. Department for International Development (DFID), London.

Do, DS. (1994). *Shifting Cultivation in Vietnam:Its Social, Economic and Environmental Values Relative to Alternative Land Use*. Land Use Working Group, Ministry of Forestry, Hanoi and Forest Science Institute of Vietnam, Chem Tu Liem, Hanoi.

General Statistical Office and UNDP (2001). *1999 Population and Housing Census: Census Monograph on the Internal Migration and Urbanization in Vietnam*. Statistical Publishing House, Hanoi.

General Statistical Office (2004). *Result of Survey on Households Living Standards 2002*. Statistical Publishing House, Hanoi.

Government of Vietnam (1992). *Constitution of Vietnam*. The National Assembly, Hanoi, Vietnam.

Government of Vietnam (2003). *Land Law. Luat Dat Dai*. National Political Publisher, Nha Xuat Ban Chinh Tri Quoc Gia, Hanoi.

Government of Vietnam (1996). 656/TTg, Decision of the Prime Minister on Socio-economic Development in the Central Highlands Period from 1996–2000 and 2010. Socialist Republic of Vietnam, Hanoi, September 1996.

Government of Vietnam (1997, 1998, 1999). National Assembly Resolution 08 of 1997, Decision No. 661/TTg dated 29 July 1998 by the Prime Minister and Joint Circular No. 28/1999/TTLT dated 3 January1999 by the MARD concerning a Five Million Hectare Reforestation Programme. Socialist Republic of Vietnam, Hanoi.

Government of Vietnam (1998). Decision No. 245/1998/QD-TTg dated 21 December 1998 by the Prime Minister on decentralisation of forest management and the exercise of State Management responsibilities of various levels concerning forest and forest land. Socialist Republic of Vietnam, Hanoi.

Government of Vietnam (1999). Degree No. 163/1999/ND-CP dated 16 November 1999 by the government concerning allocation and lease of forest land to organizations, households and individuals for long-term purposes. Socialist Republic of Vietnam, Hanoi.

Government of Vietnam (2000). *Socio-economic Development Strategy, 2001–2010*. The Socialist Republic of Vietnam, Hanoi.

Government of Vietnam (2001). Decision No. 178/2001/QD-TTg dated 12 November 2001 by Government on beneficiaries, obligation of households, individuals has allocated and leased forests and forest land. Socialist Republic of Vietnam, Hanoi

Government of Vietnam (2002). *Comprehensive Poverty Reduction and Growth Strategy (CPRGS)*. Socialist Republic of Vietnam, Hanoi.

Hakkala, K., Ho-Kyoung Kang, O. and Kokko, A. (2001). *Step by Step: Economic Reform and Renovation in Vietnam before the 9th Party Congress.* European Institute of Japanese Studies and Stockholm School of Economics. Stockholm.

Hardy, A. (2000). Strategies of migration to upland areas in contemporary Vietnam. *Asia Pacific Viewpoint*, 41(1): 23–34.

Hardy, A. (2003). *Red Hills. Migrants and the state in the highlands of Vietnam.* University of Hawaii Press, Honolulu.

ICARD and Oxfam (GB and Oxfam HK) (2002). *The Impact of the Global Coffee Trade on Dak Lak Province, Vietnam: Analysis and Policy Recommendations.* Final. ICARD/Oxfam. Hanoi, Vietnam.

IMF (2002). *Vietnam Selected Issues and Statistical Appendix, Country Report No 02/5*. www.imf.org/external/country/VNM/index.htm

Jamieson, NJ. (1996). *Ethnic Minorities in Vietnam: A Country Profile*. Hanoi, World Bank, Winrock.

Jamieson, NJ., Le, TC. and Rambo, AT. (1998). *The Development Crisis in Vietnam's Mountains*. Honululu, East-West Center Special Reports No. 6.

Kasperson, JX. and Kasperson, RE. (2001). *International Workshop on Vulnerability and Global Environmental Change*. Stockholm Environment Institute Risk and Vulnerability Programme Report 2001-01. Stockholm.

Khong D. (2002). *Population and Ethno-Demography in Vietnam*. Silkworm Books, Chiang Mai.

Lindskog, E. and Vu NL. (2004). *Resettled but not Restored. Evaluation of the Resettlement Process in the Song Hinh Hydro-power Multipurpose Project, Phu Yen Province, Vietnam*. Sida/SEI/Institute of Tropical Biology, Stockholm.

Locke, C., Adger, WN. and Kelly, PM. (2000). Changing Places. Environmental Impact of Migration. *Environment*, 42(7).

Luu H. and Vorpahl, M, (1997). *Traditional Natural Resources Managemen: Strategies of the M'nong in Lak District, Dak Lak Province*. Report on field study on behalf of GTZ and MRC in sustainable management of resources in the Lower Mekong Basin. GTZ/MRC, Hanoi.

Ministry of Agricultural and Rural Development (1996). *Allocation of Labour Force, Implementation of Fixed Cultivation and Sedentarisation Programme and Establishment of New Economic Zones in the Central Highlands (1996–2000–2010 period)*. MARD, Hanoi.

Ministry of Agriculture and Rural Development (2001) *Five Million Hectare Reforestation Program Partnership Synthesis Report.* MARD, Hanoi.

Ministry of Labour, Invalids and Social Affairs (1997); Institute of Labour Science and Social Affairs. *Project VIE/95/004 – Strengthening the Capacity for Internal Migration Policy Development in Vietnam*. Report on the Results of the Survey on Rural Migration in Dak Lak Province. Hanoi, July, 1997.

Ministry of Planning and Investment (2004). Website: www.mpi.gov.vn

Norlund, I., Tran NC. and Nguyen DT. (2003). *Dealing with the Donors – The Politics of the Comprehensive Poverty Reduction and Growth Strategy*. Institute of Development Studies, University of Helsinki, Policy Papers 4/2003.

Oxfam International (2002). *Mugged. Poverty in your coffee*. Oxfam International. www.maketradefair.com

People's Committee of Dak Lak Province, Department of Agriculture and Forestry (1995). *Evaluation of Forest Resources in Dak Lak Province – Vietnam Period 1982–1992–1995* (in Vietnamese). People's Committee of Dak Lak Province, Buon Ma Thuot.

People's Committee of Dak Lak Province, Department of Agriculture and Forestry (2000). *Plan for Forest Protection and Development, Period 2000–2010,* Dak Lak Province. People's Committee of Dak Lak Province, Buon Ma Thuot.

Poverty Task Force (2002). *Reducing Vulnerability and Providing Social Protection, Localizing MDGs for Poverty Reduction in Vietnam, Strategies for Achieving the Vietnam Development Goals*. World Bank in cooperation with GOV, the donor society and international NGOs. World Bank, Hanoi.

Salemink, O. (1997). The King of Fire and Vietnamese Ethnic Policy in the Central Highlands. In: Don McCaskill and Ken Kampe (eds), *Development or Domestication? Indigenous Peoples of Southeast Asia*. Chiang Mai: Silkworm Books.

Salemink, O. (1998). Customary Law, Land Rights and Internal Migration. *Vietnam Social Sciences* 2/2000. Hanoi, National Centre for Social Sciences and Humanities.

Sachs, J., Mellinger, A. and Gallup, J. (2000). Climate, coastal proximity, and development. In: Clark, GL. Feldman, MP. and Gertler, MS. (eds). *Oxford Handbook of Economic Geography.* Oxford University Press, Oxford.

Sida/SEI (2004). *Resettled but not Restored – Evaluation of the Resettlement Process in Song Hinh Hydropower Multi-purpose Project. Phu Yen province, Vietnam*. Sida and Stockholm Environment Institute, Ho Chi Minh City.

Sikor, T. and Apel, U. (1998). *The Possibilities for Community Forestry in Vietnam.* Discussion paper prepared with the support of the Asia Forest Network, Working Paper Series. (www.mekonginfo.org)

Sikor, T. with assistance from Nguyen TB. (2000) *Forest Allocation in Dak Lak: An Initial Assessment*. Consultancy Report for GTZ and Mekong River Commission Secretariat.

Statistical Office of Dak Lak Province (1985, 1994, 1999, 2000 and 2001) Statistical Year Books (in Vietnamese). Buon Ma Thuot, Dak Lak province.

Tay Nguyen University (2000). Extract from a report (in Vietnamese) regarding a model for forest allocation in Thon 6 village, Dak R'Tih commune, Dak R'Lap district, Dak Lak province.

Tay Nguyen University (2001). *Gender Issues in Participatory Technology Development. A case study in the lands and forest allocated to the M'nong community in village 6 Dak R'Tih commune, Dak R'Lap district, Dak Lak province.* Le Thi Ly, MA & SFSP members, Tay Nguyen University, Faculty of Agriculture & Forestry, Social Forestry Support Programme.

Tran HN, Sikor T., Dang TL., Nguyen VD. and Vu VM. (2002). *Devolution of Forest Management: Six Years of Experience in Dak Lak.* Department of Agriculture and Rural Development, Dak Lak and Sustainable Management of Resources in the Mekong Basin.

Trinh TG. et al. (2000). *Coping with Complexity: Managing Water Resources in a Dynamic Upland Environment in Dak Lak.* First draft of the final report of a collaborative REPSI-UAF Research Project. University of Agriculture and Forestry, Thu Duc, Ho Chi Minh City, Vietnam.

UNDP (1998). *The Dynamics of Internal Migration in Vietnam*. UNDP Discussion Paper 1. United Nations Development Programme, Hanoi.

UNDP (2002). *The United Nations in Vietnam, Millennium Development Goals: Bringing the MDGs closer to the people*. United Nations Development Programme, Hanoi.

UNDP (2003). *Human Development Report 2003.* United Nations Development Programme.

UNDP/MARD Disaster Management Unit. (hhtp://www.undp.org.vn/dmu)

Vuong X., T., and Bui M., D., (2000). *Traditional Land Ownership and Land Use of Ethnic Minorities in Vietnam A Desk Study*. Vietnam–Sweden Cooperation Programme on Land Administration Reform. Hanoi. 57 p.

Worldbank, International Task Force on Commodity Risk Management (2002). *Vietnam: Agricultural Price Risk Management. Pepper; Rubber; Coffee*. Phase I Reports, June.

ANNEX 1 OVERVIEW: COFFEE AREA

Risks, their causes and effects, response from local authorities and farmers, and impacts on different income groups

Risk	Analysis of the causes and effect of the risks	Coping strategies		Impact of risks on different income groups
		Local authorities (mainly plans)	Farmers' remedies	
1. Changing climate, more frequent and extended droughts (1995, 1998, 2001, 2002) Floods due to more short and heavy unexpected rainfalls Erosion: when cultivation is done on sloping land Landslides	▪ General change in the world climate (*El niño*, *El niña*) ▪ Destruction of forest cover affecting the watersheds ▪ Extensive monoculture coffee cash cropping with high demand on water supply	▪ Forest plantations ▪ Expansion of irrigation systems and flood control ▪ Technical advice on cultivation of coffee and other crops ▪ Structural change of tree plantations	▪ Digging deeper wells ▪ Constructing reservoirs ▪ Buying water for the coffee trees ▪ Choosing rice varieties of short duration (100 – 120 days) to avoid impact of floods. ▪ Digging hollows around the coffee trees to keep water and planting trees to prevent erosion. ▪ Planting trees around the coffee for shade and wind breaks.	▪ Lack of water more hazardous for the poor farmers as they do not have the means to get access to water supply and as purchasing water and/or renting equipment is expensive. ▪ Poor farmers encouraged to plant in soils already lacking water. ▪ Impact from drought and floods heavier when coffee prices are low as the former affect the wet rice yields.
2. Rapid changes in land use	▪ Rapidly increasing coffee prices encouraged a majority of farmers and non-residents to plant coffee trees ▪ When prices drastically fell, many farmers cut down the trees for other crops	▪ Long term land use planning ▪ More careful analysis of soil quality and capacity ▪ Improved extension advice	▪ Better off farmers largely maintain their coffee plantations ▪ Poorer farmers try to change for other crops or sell or lease their land	▪ Average and poor groups more exposed as sudden investments are relatively more costly and the soil might be inappropriate. ▪ Cutting down existing coffee trees is also costly. Selling/leasing land at relatively low prices.
3. Forests seriously depleted	Forests depleted at first by commercial logging; later by extended agricultural use (dry rice, beans etc) and finally by coffee plantations	▪ Earlier efforts to restore the forest by tree plantations failed, as a result of continued destruction of forests for coffee plantations ▪ Trials with re-forestation are going on	No special action related to the depletion. It is largely accepted as a fact.	It has affected the indigenous peoples as they have lost their (free) access to (forested) land traditionally used for shifting cultivation. As a result, these peoples have had no choice but to adapt to modern agricultural techniques including cash cropping (such as coffee).

Risk	Analysis of the causes and effect of the risks	Coping strategies		Impact of risks on different income groups
		Local authorities (mainly plans)	Farmers' remedies	
4. Considerable reduction of grazing land for large livestock (cows and buffaloes)	▪ Replacement of grazing land by coffee plantations ▪ Large livestock was sold to create investment capital in coffee plantations ▪ traditional capital accumulation of indigenous peoples reduced ▪ loss of fertility of land (no natural dung)	No particular plans to increase the number of livestock as all attention has been reserved for coffee plantations	No special action related to the loss. Dung is replaced by chemical fertilisers although dung is much preferred	Indigenous peoples are getting poorer as they traditionally have used livestock as savings and a source of secure access to capital. Alternatives today are private loans or bank loans which they regard as much more risky. Being animals to be slaughtered during traditional worshipping cows and buffaloes have now been exchanged by pigs and chickens.
5. Expansion of coffee plantations onto land unsuitable for coffee. Coffee turning into a monoculture .	▪ Due to the high coffee prices during the 90s. ▪ Large in-migration added to the break down of all official plans for coffee plantations	See 2. In reality, the provincial authorities' original plan of 70,000 ha was later revised to 170,000 ha based upon known available water resources. During the coffee rush the area rose to 264,000 ha. There are plans to turn 40,000 ha of coffee land over to other crops	▪ Maintain the coffee trees (often by increasing existing debts) although they produce low yields ▪ Switch to other crops such as beans, maize and sugar cane ▪ Leave land fallow and take jobs as seasonal labourers	▪ No major impact on better off and average farmers as they normally do not manage or use such land for coffee (they have switched to other crops) ▪ The poor farmers are affected in a vicious circle as they often do not have access to sufficient capital (and sometimes also not the skill) to invest in such land. The land is deteriorating and in the end not suitable for any crops at all ▪ Recent migrants are highly affected as they have used all their capital to buy land and invest in coffee on land that is not suitable
6. Scarce and declining water resources lead to competition between crops	The high demands on water from coffee plantations in upstream areas suggest reductions of water supply to wet rice land areas in low stream areas	▪ Planned water reservoir in Ea Nuol was not built as it would reduce a wet rice area by 25%. ▪ Most irrigation systems were built for the state coffee farm	The farmers prefer to keep both coffee and rice, but accepting lower yields in rice if (the highly water-demanding) coffee can be maintained.	The competition is mainly a risk for poor farmers as they lack resources to invest adequately in both coffee and wet rice. Also, they usually do not have sufficient land for other crops when their wet rice land is affected by lack of water. This lack of water means that the rice fields can only produce one crop per year which is not sufficient for own consumption.

Risk	Analysis of the causes and effect of the risks	Coping strategies		Impact of risks on different income groups
		Local authorities (mainly plans)	Farmers' remedies	
7. Rapid changes in coffee prices. Ex: in 2000 the value of coffee was 1/10 of the value in 1999 (from VND 40,000 to VND 4,000/kg)	The market in Vietnam is dependent on world market prices	▪ Diversification is the main solution to the dependency on world market ▪ Authorities started campaigns to breed small livestock (pigs and chickens) ▪ Local and national coffee companies could act as a buffer between the farmers and the world market ▪ The state has a policy to purchase coffee as a reserve to maintain the coffee prices for the coffee exporters	▪ Better off and average farmers set up stores of coffee in order to level out the peaks and falls in prices ▪ Diversification (but maintaining coffee trees). Poor farmers are combining coffee with other crops or switching entirely to other cash crops ▪ Some farmers started breeding pigs and chickens	▪ All income groups are affected, although the better off and average farmers have buffers (capital: they have capital accumulated in the time of high coffee prices because they started growing coffee trees early.) or other measures (know-how) to cope ▪ Poor farmers do not have these buffers and much weaker coping measures ▪ Pig breeding in many villages failed since it was hit by epidemics reducing the number by 50%.
8. The quality of the soil is deteriorating	▪ Intensive coffee monoculture putting high demands on the use of chemical fertilisers and water ▪ Insufficient investments lead to shorter life cycle of the coffee tree from 40-60 to 20-25 years in turn demanding higher investments on degrading soils	See 2.	See 5.	▪ Thanks to diversification, better off and average farmers are less affected. Diversification includes other crops as well as small livestock breeding such as pigs ▪ Poor farmers are still at high risk (debts to the bank, and private lenders, no capital investment, lack of skills)
9. Level of coffee yields directly related to investment capacity: land, capital (for fertilisers and water) and know-how of each household (HH)	▪ Generally, in order to get profitable yields, there is a need for application of sufficient amounts of water and fertilizers. ▪ This puts high demands on each farming HH's capacity to invest capital and technical know-how	▪ Expansion of the irrigation system and control of water ▪ Expansion of extension services in coffee growing	▪ Better off and average farmers maintain high levels of water and fertiliser input. ▪ Poor farmers abandon the use of fertiliser and at best keep watering the coffee plants	▪ No major impact on better off and average farmers. ▪ Poor farmers at high risk of they do not diversify ▪ Poor farmers have difficulties in getting high (or sufficient) yields because the costs of investments are always higher for them
10. Size of land holdings affects investment capacity	▪ Smallholder farmers do not have sufficient collateral to borrow from the bank ▪ Even with investments, small plots are not so profitable (coffee)	-	The poor farmers are selling or leasing their land to the more successful farmers	Poor farmers risk losing their land Their opportunities for upgrading their current land plots are few

Risk	Analysis of the causes and effect of the risks	Coping strategies		Impact of risks on different income groups
		Local authorities (mainly plans)	Farmers' remedies	
11. Level of investment is reduced when prices are low, leading to lower yields	A vicious circle	No specific plans other than encouraging poor farmers to diversify or totally stop growing coffee in unsuitable areas	All income groups have taken the initiative to cut down coffee trees (partly or totally)	Poor farmers at highest risk. They are the groups who cut down the total of their coffee trees. To change land use is comparatively more costly for the poor. The subsequent year's coffee yield is also affected due to lack of investment in the times of low coffee price. See also 7 and 8
12. Cutting down the coffee trees – costs are high and alternatives are not clear	When the coffee prices went dramatically low (far below investment costs) a spontaneous reaction among many farmers was to cut the trees down	Authorities prefer to lead the change of land use. They are reporting about plans to balance monoculture with diversification	Seeking alternative cash cropping such as maize, beans, sugar cane but without formal advice or extension	All farmers are losing but the impact is greatest among the poor due to limited land, lower quality land, comparatively higher costs to change land use and limited knowledge for choosing a better alternative to coffee.
13. Large loans taken during the coffee boom (1995-1999) cannot be paid back	▪ The strong belief in the value of coffee during the boom led to large loans in banks (relative to income in all farmer groups) for continued investments ▪ Private traders in fertilisers give loans to high interest (50 % a year)	The banks have prolonged the time for repayment. The authorities have reduced the taxes for farmers in debt.	Farmers appreciate the delay in re-payment, hoping that the value of coffee will rise again thus allowing them to repay. They might be able to pay it back from other production. Poor farmers cannot easily get out of the debts from private lenders.	All farmers in debt to the banks have difficulties repaying loans. In absolute figures the better off are in greatest debt but the poor farmers are at greatest risk as their margins are small or none, even though they took out smaller loans. In addition, the poor are often dependent on private lenders/traders.
14. Trade in coffee land increases land prices.	It is generally recognised that high value crops increase the value of the land.	No particular action. Whether the government plans to officially recognise a real estate market is not yet known.	Most farmers try to keep their land, being aware of its relative value. However, the poorest strata lose out.	Poor farmers with low investment capacity tend to sell or lease out their land to better off farmers, thus risking losing their land in part or entirely.
15. Indigenous peoples sold land to migrants and non-residents	Growing coffee demands know-how and high investment costs (fertiliser, water). Indigenous peoples consider they do not have the necessary capacity.	Local authorities are purchasing land to hand over to the farmers who have lost land. Alternatively, authorities are trying to find ways of stopping farmers from selling their land.	Farmers, in this case the indigenous peoples, went elsewhere to clear new land (if available) or become seasonal labourers for other farmers.	Poor indigenous peoples run the risk of getting poorer.

Risk	Analysis of the causes and effect of the risks	Coping strategies		Impact of risks on different income groups
		Local authorities (mainly plans)	**Farmers' remedies**	
16. Competition for land in general and for land of good quality in particular has increased.	Kinh people have more capacity (know-how, experience, capital to invest) for cash cropping; thus making better use of existing good quality land, improving quality of land (of earlier less good quality) and increasing resources to purchase more land.	Local authorities are purchasing land to hand over to the farmers who have lost land. Alternatively, authorities are trying to find ways of stopping farmers from selling their land.	Poor farmers loose land and become seasonal laborers on other farmers' land.	Poor farmers (largely comprising indigenous peoples) with limited resources run the risk of becoming even poorer. They do not only lack resources in form of land, know-how and capital for investments but they also lack the necessary social network that gives more fortunate farmers access to information and assistance of different kinds.
17. Paddy production yield per capita decreased between 1995 and 2001, leaving an increasing number of people dependent on non-rice income generating activities.	(This question was not directly discussed. The information is cited from the Statistical Yearbook, Dak Lak, 2001)	Generally, the authorities hope that farmers will get used to relying on non-rice income generating activities and trust that the market can supply sufficient quantities (and quality) of rice.	Many farmers, especially the poor farmers, use all means to stick to their land.	Poor farmers are losing the most as there are few income opportunities other than living on their own land (except as seasonal labourers). In addition there is a strong psychological stigma of being a 'landless farmer'. See footnote 7.
18. Changes in land management since 1975 favour farmers and non-residents who are experienced in producing a surplus (rather than self subsistence, normally the aim of traditional farming techniques or dry crop rotation by the indigenous).	1975–1989 collective land management by the state and the cooperatives. 1989 *Doi Moi* policy. Land is allocated to farming HHs (although state farms and state forest enterprises still exist).	Since 1994, the vast majority of farmers have LUCs. And efforts are being made to ensure that all farmers have LUCs. Where farmers are still using dry crop rotation techniques this land does not normally have an LUC.	No particular action, but the changes in land management (from userfruct rights, to collectively managed, then to privately managed) is a big change for indigenous peoples.	The main impact is that indigenous peoples are not used to regarding their land as 'private'. The strength of the coffee boom and the land market it created exposes the less experienced indigenous peoples to the risk of falling behind and even losing land.

Risk	Analysis of the causes and effect of the risks	Coping strategies		Impact of risks on different income groups
		Local authorities (mainly plans)	Farmers' remedies	
19. Poor households falling into permanent poverty	Their main problems are: lack of land, too small plots, lack of capacity (as defined above).	▪ The state has calculated that 1 ha of coffee or 0.5 ha of dry rice land or 0.25 ha of wet rice land should be sufficient to feed one household of common size. ▪ Authorities are resettling poor households to new areas with land for housing and cultivation.	▪ Poor farmers sell or lease out their land and become seasonal labourers. ▪ They become permanently dependent on state support.	See 16. ▪ Few poor households can fill the quota of 'survival' stipulated by the state. ▪ They become trapped in a vicious circle.

ANNEX 2 OVERVIEW: WET RICE AREA

Risks, their causes and effects, response from local authorities and farmers, and impacts on different income groups

Risk	Analysis of the causes and effect of the risks by local authorities and farmers	Coping strategies		Impact on different income groups
		local authorities (mainly plans)	farmers' actual remedy	
1. Changing climate; floods and droughts more frequent (1998, 2000, 2001, 2002) usually destroying up to 20% of the cultivated area, corresponding to 1/3 or ½ of the annual yield; in 2000 there was a major landslide from nearby mountains destroying the irrigation system	a. General change in the world climate b. Destruction of forest cover affecting the watersheds c. Floods are regarded as 'normal' d. Droughts are caused by the generally changing climate.	▪ Expansion of irrigation systems ▪ In disaster years the state has supported farmers with rice seeds (on average 10 kg per HH) and sometimes rice for consumption.	Poor farmers (88% of whom are indigenous peoples of the M'nong ethnic group) regard the state support as insufficient and turn to better off Kinh HHs to 'borrow unripe rice'.[1] About 50% of farmers follow this system.	▪ Poor farmers, who represent over 60% of the total number, are directly affected by the lower rice yields caused by droughts and floods. They enter easily in a vicious circle after falling into debt to better off farmers. ▪ Better off farmers (M'nong as well asmigrant Kinh and Thai) are also affected but their land is spread over different areas and thus less prone to total destruction by droughts and floods.
2. Strong dependency of all HHs on wet rice cultivation generating low yields	a. Farmers have small plots; on average 0.2 ha/HH b. Farmers do not have capital for investments. c. Farmers (mainly M'nong) are not used to handling 2 harvests per year.	▪ Expansion of irrigation ▪ Establishment of agricultural models	The poor farmers make use of traditional sources of income such as keeping livestock as capital and turn to the forest for non-timber-forest products (NTFP) such as bamboo shoots for sale.	The poor farmers (in particular the M'nong) are continuously poor (See also 1) and have few options to improve their livelihood as extension efforts do not reach them.

[1] In a never-ending circle the poor farmers borrow in kind (sometimes in cash) before the harvest. At harvest time (usually after 3 months) they have to pay back in paddy with an interest of 20%. If they pay back one year later, the interest rate is 50% or the double value of the original debt.

Risk	Analysis of the causes and effect of the risks by local authorities and farmers	Coping strategies		Impact on different income groups
		local authorities (mainly plans)	farmers' actual remedy	
3. The rise of coffee prices between 1995 and 1999 affected the area, but not to the same degree as compared to the Upland Area	a. While the area is generally not suitable for coffee, 41 ha were planted with coffee during the coffee boom. Today it has been reduced to 15 ha. This happened in particular in Ma village. b. Over 50% of those who planted coffee had low yields (1.4 ton/ha as compared to 2.3 ton/ha in the province as a whole)	▪ Introduction of other cash crops such as maize, cassava, sugar cane and cacao. ▪ 5 agricultural models have been introduced aiming at diversification.	▪ Farmers started the coffee plantations spontaneously and also switched to other crops when the coffee made a loss. ▪ Cash cropping in other crops and diversification into VAC[2] models are new remedies.	Many farmers affected by the changes are the better off farmers (in particular the Kinh, but also some M'nong and 17 Thai HHs in-migrated from northern Vietnam). Unlike the poor farmers, these farmers have access to alternatives.
4. The 'borrow unripe rice' system is increasing dependency and depriving poor farmers of opportunities for saving.	a. Low yields make poor farmers dependent on more successful farmers. b. Small plots of wet rice reduce possibilities for investments.	-	-	Poor farmers are in a vicious circle that is hard or impossible to break.
5. Producing for a market is not yet an option for poor farmers with small plots and low yields in wet rice cultivation.	-	-	-	-
6. The introduction (after 1975) of two wet rice harvests per year is not an option for poor farmers.	-	-	Because of the frequent droughts, farmers keep to one harvest per year in order to avoid risks.	Poor farmers are not motivated for more intensive farming. There might be more reasons than those mentioned here that this case study was unable to explore.
7. Local M'nong traditions are not considered when state allocates support.	-	-	-	Women are not recognised as having an important role in decision making, resulting in in-efficient use of external support. Subsidies to poor farmers have limited effect.
8. Considerable areas have infertile soils.	-	Projects have been introduced to support farmers in growing trees such as cacao and longan.	-	Whether farmers have large and small areas of land dominated by sandy soils, all income groups are confined to growing maize and cassava, usually producing low revenues.

[2] V – vuon (garden); A – ao (fishpond); C – chuong (stable).

ANNEX 3 OVERVIEW: UPLAND AREA

Risks, their causes and effects, response from local authorities and farmers, and impacts on different income groups

Risk	Analysis of the causes and effect of the risks by local authorities and farmers	Coping strategies		Impact on different income groups
		local authorities (mainly plans)	farmers' actual remedy	
1. Droughts occurred in 1997 and 2000; the latter destroying 25% of the wet rice crop and 30% of the coffee crop. The dry crop rotation areas were not affected as harvests had taken place before the droughts.	No particular explanation as floods and droughts are considered not to have a great impact on people's livelihood.	In 2000 the Dak R'Lap district gave support in form of irrigation equipment (2 water pumps).	While the impact of droughts and floods is generally considered to be low, farmers are happy with their tradition of using dry crop rotation techniques.	Losses affect the poor farmers more.
2. While dry crop rotation cultivation (mainly rice) is the most important source of income for the indigenous peoples, cash cropping (coffee and rubber) is increasingly competing with the traditional land use pattern in the area.	Authorities usually regard dry crop rotation techniques as not sustainable. Indigenous peoples (mainly M'nong) think that these techniques are best suited to their experience and capacity.	▪ No particular support for dry crop rotation cultivation. ▪ Intensive cultivation is encouraged.	-	The introduction of coffee plantations has encouraged in-migration (in an otherwise quite remote area) and non-residents to open up land for coffee. Earlier unknown sale of land becomes an issue. Both events are encroaching upon land used by the indigenous peoples.
3. Forests are threatened by uncontrolled logging, and in-migration by Kinh and Tay ethnic groups who clear land for coffee (Kinh) and dry rice rotation growing (Tay).	a. This is the outcome of rising coffee prices and in-migration. b. The state forest enterprise has limited capacity to control these events. c. Indigenous peoples (M'nong) complain that in-migrated Tay are not knowledgeable about the conditions for successful dry crop rotation cultivation leading to unsustainable use of forest.	Models are established for protecting the forest by allocating forest land to the indigenous peoples for their management.	▪ Farmers are taking initiative to protect the forest on HH basis. ▪ Some farmers (10 HHs) are taking part in a project to manage about 1,000 ha of forest.	There is an impact on all farmers, but especially poor farmer who have no reserves. However, forest allocation is beginning to have positive effects in creating additional income for all groups including the poor farmers.
4. Indigenous peoples rely heavily on NTFPs that are threatened with extinction	It is a strong tradition among the indigenous peoples.	Local authorities are trying to introduce intensive cropping methods (rice, rubber) in order to create a more sustainable income for the farmers.	-	Poor farmers rely comparatively more on the NTFPs and when these are exhausted these farmers will lose an important income source.

5. Wildlife and biodiversity are threatened by extraction of wild animals for sale.	See 3. c. Professional hunters coming from outside are emptying the forests. d. Indigenous peoples are also hunting (paid by the outsiders) to get extra income but they are only hunting small animals such as birds; this is considered to have less impact.	See 3.	-	See 4.
6. The spring rice crop is producing low yields (about 1 ton/ha).	a. Farmers are not used to intensive cropping and to the necessary techniques (like using draught animals).	▪ The state is supporting farmers with rice seeds every year. ▪ There are models to support the farmers.	-	While poor farmers are less interested in wet rice cropping the impact is relatively higher on better-off farmers. The latter would have a more secure income if yields were higher.
7. The spontaneous growing of coffee in home gardens and on dry crop rotation fields led to losses in income.	a. Farmers (better off and poor) hoped to get a good income from coffee.	Introduction of extension in coffee growing techniques.	-	All groups of farmers were affected. However, the impact on the poor farmers was heaviest as they do not have the capacity to switch to other cash crops.
8. Dry crop rotation fields situated in remote areas (10 to 15 km way from the village).	a. Farmers have to stay out in the fields up to 7 days or more under basic conditions.	-	No remedy. The farmers believe they are very dependent on this kind of technique, which is the basis of their main income.	The poor farmers are more heavily affected as they usually have smaller areas, have no means of transport and no extra labour to take care of their children. Thus children are accompanying their parents and do not go to school.
9. Cultivation on sloping land is causing erosion and loss of soil.	a. Farmers were encouraged to do so by locally established contracts.	-	-	The better off were more affected as they have the capacity to grow new crops on large areas including sloping land.
10. The efforts to restrict the indigenous people's tradition of using crop rotation techniques will have a negative impact on people's daily life.	The goal of the local authorities is to limit the dry crop rotation cultivation.	-	When limitations occur, farmers bring their rotation fields into even more remote areas.	Poor farmers are mostly affected as they have no means or capacity to switch to other cropping systems.

ANNEX 4 VILLAGE DATA: COFFEE AREA

District	**Cu M'gar**		**Buon Don**		
Commune	**Chu Sue**		**Ea Nuol**		
Village	**Sut M'gru**	**Thon 3**	**Ea Nieng 1**	**Ea Nieng 2 (split from Ea Nieng 1 in 1996)**	**Ea M'thar 1 (split from 2 other villages in 1996)**
Total population	189 HHs 1435 persons Ede 111 HHs Kinh 78	142 HHs 780 persons Dao 22 HHs Kinh 13 HHs Nung 7 HHs	216 HHs 1147 persons Ede 173 HHs Kinh 43 HHs	192 HHs 1029 persons All Ede	207 HHs 1427 persons Ede 194 HHs Kinh 9 HHs Other 4 HHs
No of HHs interviewed	15 Ede 14 Kinh 1	19 All Dao	18 Ede 10 Kinh 8		24 Ede 16 Kinh 8
Income groups HHs[3]	Poor: 33 Of which Ede are 31 and 2 are Kinh	Poor: 17[4] Of which 11 are Dao, 3 are Kinh and 3 are Nung	Poor: 40 Of which 38 are Ede and 2 are Kinh	Poor: 37	Poor: 36 of which all are Ede
Poor HHs % of total	17	12	18	19	17
Main sources of income	Coffee Rubber 20-30 Kinh HHs live from trading fertilisers and insecticides Seasonal labour[5]	Coffee	Coffee	Coffee	Coffee Maize Cotton Beans
No of HHs in debt and size of debt	100% are in debt to the bank; up to VND 30 million. Many HHs are also in debt to private lenders	70% are in debt to the bank; up to VND 100 million. Few debts to private lenders	All HHs in debt to the bank. Over 50% in debt to private lenders	As village Ea Nieng 1	50%; up to VND 20 million Most HHs are in debt to private lenders
Land use Total cultivated area (ha)	325	332	395	256	140
Of which Coffee	166	320	63	Most of the area	73
Rubber	77 (since 1992)				
Cotton			60		8
Sugar cane					17
Wet rice	15 (2 crops	12 (2 crops)	Some	Some	29 (1 crop)
Maize			10 (hybrid) 5 (local)		30 (hybrid)
Dry crop rotation fields	0	0	0	0	0
Other crops (cassava, beans)	0	0	123	0	94
Home gardens[6]	Yes	Yes	Yes	Yes	Yes
Forest	Since 1978 all forest cut down	1976-1980 all forest cut down	Since 1995 all forest cut down	Since 1995 all forest cut down	Since 1995 all forest cut down

District	**Cu M'gar**		**Buon Don**		
Commune	**Chu Sue**		**Ea Nuol**		
Village	**Sut M'gru**	**Thon 3**	**Ea Nieng 1**	**Ea Nieng 2 (split from Ea Nieng 1 in 1996)**	**Ea M'thar 1 (split from 2 other villages in 1996)**
Coffee history	Started in 1986 Strong development as from 1995. 1994-97 yields were 3-4 tons per ha. In 2001 31 ha were replaced by hybrid maize and cassava.	Started in 1975. Since then monoculture. In 2002 some hectares were replaced by hybrid maize	Started in 1985. Since 1997, 10 ha have been replaced by other crops.	Started in 1985.	Started in 1994 when the coffee replaced bean cultivation. 3-4 HHs started. In 1996-97 there were 60 HHs and in 2002 64 HHs. In 2001 some HHs switched to cotton, sugar and maize.
Production capacity at HH level:					
Land per HH; coffee (ha)	0.2 – 3 ha (largest: 4 ha)	1 – 3 ha (largest: 10 ha)	0.5 – 1 ha	0.2 – 0.7 ha	0.1 – 3 ha
Yield; coffee (average)	1.5-2 ton/ha	2 ton/ha	2 ton/ha	2 ton/ha	1.5 ton/ha
Land; wet rice	00.4 – 0.1 ha	00.8 – 0.1 ha	?	?	0.2 ha
Yield ; wet rice (average)	4-5 ton/ha	4-5 ton/ha	?	?	6 ton/ha
Access to water	Water pumps: a few HHs	Water pumps: most of the HHs	Water wells: most of the HHs	Water wells: most of the HHs	Water pumps: most of the HHs
Equipment	Ploughs: 1/3 of the HHs Small tractors: 56	Small tractors: most of the HHs			
Other assets	Cows: 200-300	Cows: few	Cows:218	Cows: 217	Cows: 122
Introduction of LUC[7] and rate of HHs having received LUC	By 2000 all HHs had LUC	By 1994 all HHs had LUC	By 1996 all HHs had LUC	As Ea Nieng 1	Start in 1996. Until 2002 78 HHs had the LUC.
Natural calamities	When droughts occur 50% of the coffee yield is hit. Floods occur, sometimes destroying about 20% of the rice yield	When droughts occur 60% of the coffee yield is hit. Floods occur sometimes destroying about 30% of the rice yield	When droughts occur 50% of the coffee yield is hit. No floods.	As in Ea Nieng 1	Droughts occurred almost yearly as from 1995. In 2002 50-60% of the wet rice and 50% of other crops was lost.
Migration[8]	The Kinh HHs registered so far came all during the '80s and '90s In 2001-02 another 26 Kinh HHs arrived	The Dao HHs migrated in 1954. The Kinh and Nung HHs are recent migrants	About 12 HHs migrated to Ea Nieng 1 and 2 in 1996.	See Ea Nieng 1.	Almost no migration.
Trade of land and non-resident management of land in the village	Most trade with land occurred in 1994-95 when land was sold to non-residents. But it started in 1986. Today 50 ha of the village land is managed by non-residents.	Trade with land and non-resident management is almost non-existant.	Trade with land and non-resident management of land was strongest during the years of 1994 and 1995.	See Ea Nieng 1.	As in Ea Nieng. A large area (700 ha) of the village is managed by non-residents.

ANNEX 5 VILLAGE DATA: WET RICE AREA

District	**Lak**		
Commune	**Bong Krang**		
Village	**Buon Ma**	**Dak Ju**	**Buon Thai**
Total population	99 HHs 527 persons M'nong 96 HHs Kinh 3	131 HHs 703 persons M'nong 127 HHs Kinh 4	31 HHs 157 persons Thai 19 HHs Muong 10 HHs M'nong 3 HHs
No of HHs interviewed	13 All M'nong	16 All M'nong	9 Thai 8 Muong 1
Income groups HHs[9]	Poor: 18 All M'nong	Poor: 40 All M'nong	Poor: 5 Both Thai and Muong
Poor HHs % of total	18	30	17
Main sources of income	Wet rice Other crops (hybrid maize sugar cane and cassava) Fishing Hunting and collecting firewood, wood and NTFPs Selling cow dung Livestock raising Seasonal labour[10]	As in Buon Ma	As in Buon Ma
No of HHs in debt and size of debt	Over 50 % are "selling unripe paddy", that is a debt to the paddy traders. Borrowing from the bank is not an option as the farmers are afraid of not being able to pay back	About 50% are borrowing money from the bank.	About 8 % are in debt to the bank. Debt to traders also occurs.
Land use Total cultivated area (ha)	200	117	About 250
Of which Coffee	2	5.4 (incl other industrial crops)	6.2 (incl other industrial crops)
Wet rice	60 ha (of which 40 with 2 crops)	52	12
Cassava	About 10	14	4
Maize	About 10 (grown in home gardens)	36	8
Dry crop rotation fields	Over 100 (hard to measure)	7	?
Other crops			Pepper; hard to measure
Home gardens[11]	Yes	Yes	Yes
Forest	Abundant, not measured as belonging to the village	As in Buon Ma	As n Buon Ma
Use of forest	Hunting and collecting firewood, wood and NTFPs.	As in Buon Ma	As in Buon Ma
Coffee history	Started in 1995 with about 10 ha (now down to 2 ha)	Started in 1995. Basically ended in 2000.	Started in 1995. 1/3 of the area was replaced by other crops in 2002. Some HHs grow coffee in their home gardens.
Other assets			

District	**Lak**		
Commune	**Bong Krang**		
Village	**Buon Ma**	**Dak Ju**	**Buon Thai**
Production capacity at HH level:			
Wet rice	0.1 - 1 ha	0.5 - 2 ha	0.5 - 2 ha
Dry crop cultivation area	?	?	Dry crop cultivation by pioneering
Yield wet rice	Irrigated area: 4-5 ton/ha Non-irrigated area: 3 ton/ha	1.5 ton/ha	?
Access to water	10 ha of the wet rice is irrigated	No irrigation system	No irrigation system
Equipment	Some ploughs	Ploughs: 20	0
Other assets	Cows: 170 Buffaloes: 39	Cows: 125 Buffaloes: 7	Cows: 32
Introduction of LUC[12] and rate of HHs having received LUC	By 1998-2000 the LUC started to be issued. About 65% of the HHs have received the LUC	As in Buon Ma	As in Buon Ma
Natural calamities	When droughts occur 20% of the wet rice is hit. Floods occurred in 1998 and 2000 destroying 20 ha of wet rice. In addition in 2000 landslides destroyed 40 ha of wet rice. The local perception is that the calamities are increasing in strength and frequency.	When droughts occur, the crops fail. Floods have occasionally destroyed about 5 ha.	As in Buon Ma
Migration[13]	The Kinh HHs arrived in the middle of the 1990s.	As Buon Ma	All Thai and Muong HHs are migrants from northern Vietnam since about 1990-91.
Trade of land and non-resident management of land in the village	0	0	0

ANNEX 6 VILLAGE DATA: UPLAND AREA

District	**Dak R'lap**	
Commune	**Dak R'tih**	
Village	**Thon 6**	**Thon 7**
Total population	73 HHs 365 persons M'nong: 71 HHs Kinh: 2 HHs	27 HHs 114 persons All Tay
No of HHs interviewed	23 All M'nong	6 All Tay
Income groups HHs[14]	Poor: 11 HHs All M'nong	Poor: all 27 HHs
Poor HHs % of total	15	100
Main sources of income	Dry crops from rotation techniques Hunting, collecting NTFPs Trials with forest allocation to HHs Seasonal labour[15]	Dry crops from pioneering agriculture Hunting, collecting NTFPs Seasonal labour; all HHs frequently
No of HHs in debt and size of debt	Few HHs are in debt to the bank or to private traders	As in Thon 6
Land use Total cultivated area (ha)	64	?
Of which Coffee (since 1998)	About 40 ha	?
Rubber (since 2002)	?	?
Wet rice (since 1976)	< 20 ha	12 ha (2 crops)
Cassava	?	?
Dry crop rotation fields[16]	150 ha (coffee, rubber, cassava, maize, sugar cane)	Area not indicated (dry rice)
Other crops	Coffee, fruit trees, vegetables	
Home gardens[17]	Yes	Yes
Forest	Abundant, not measured as belonging to the village	As in Thon 6
Use of forest	Hunting and collecting firewood, wood and NTFPs.	As in Thon 6
Coffee history	Started in 1995. Low yields due to lack of investment resources	Started in 1995. Low yields.
Production capacity at HH level: Land area per HH:		
Dry crop rotation	5 ha	At least 1 ha
Dry rice yield	1.5 ton/h	1.5 ton/ha
Coffee area	< 0.5 ha	0.6 ha
Coffee yield	< 1.5 ton/ha	< 1.5 ton/ha
Wet rice area	0.2 - 0.3 ha	< 0.5 ha
Wet rice yield	3-4 ton/ha	3-4 ton/ha
Access to water	No irrigation system	No irrigation system
Equipment	0	0
Other assets	Cows and buffaloes: 116	0
Introduction of LUC[18] and rate of HHs having received LUC	Issued since 1997 for the 64 ha of lowland fields and home gardens (not the swidden fields)	No LUCs issued as the land management and land use are not clear yet.
Natural calamities	Big droughts occurred in 1997 and 2000. Floods do not have any impact	As in Thon 6

District	**Dak R'lap**	
Commune	**Dak R'tih**	
Village	**Thon 6**	**Thon 7**
Migration[19]	0	Migration by the Tay ethnic groups (from northern Vietnam) started during the late 80ies. This village was officially established as from 2000.
Trade of land and non-resident management of land in the village	The most vivid trade took place in 1994-95. Non-resident are managing about 100 ha of land.	0

The Stockholm Environment Institute (SEI)

SEI is an independent, international research institute specializing in sustainable development and environment issues. It works at local, national, regional and global policy levels. The SEI research programmes aim to clarify the requirements, strategies and policies for a transition to sustainability. These goals are linked to the principles advocated in Agenda 21 and the Conventions such as Climate Change, Ozone Layer Protection and Biological Diversity. SEI along with its predecessor, the Beijer Institute, has been engaged in major environment and development issues for a quarter of a century.

Mission

SEI's mission is to support decision-making and induce change towards sustainable development around the world by providing integrative knowledge that bridges science and policy in the field of environment and development.

The SEI mission developed from the insights gained at the 1972 UN Conference on the Human Environment in Stockholm (after which the Institute derives its name), the work of the (Brundtland) World Commission for Environment and Development and the 1992 UN Conference on Environment and Development. The Institute was established in 1989 following an initiative by the Swedish Government to develop an international environment/development research organisation.

Risk and Vulnerability Programme

This programme conducts research on environmental and technological hazards and global environmental change. Expanding on ongoing and previous work on risk analysis, risk perception, and risk management, research now also focuses on the differential vulnerability of people, places, and ecosystems. The hallmark of this programme is integrated analyses that seek to bridge the best of the social and ecological sciences. A major priority is the development of policies and initiatives that hold promise for enhancing human security, adaptive capacities, social equity, and resilient societies.

Stockholm Environment Institute

SEI-HQ
Director: J. Rockström
Box 2142
S-103 14 Stockholm
Sweden
Tel+46 8 412 1400
Fax+46 8 723 0348
E-mail postmaster@sei.se
www.sei.se

SEI-Boston
Director: P. Raskin
11 Arlington Street
Boston, MA 02116-3411
USA
Tel+1 617 266 8090
Fax+1 617 266 8303
E-mail seib@tellus.org
www.seib.org

SEI-Tallinn
Director: V. Lahtvee
Lai 34, Box 160
EE-10502, Tallinn
Estonia
Tel+372 6 276 100
Fax+372 6 276 101
E-mail seit@seit.ee
www.seit.ee

SEI-York
Director: J.C.I. Kuylenstierna
University of York
Heslington, York YO10 5DD
UK
Tel+44 1904 43 2897
Fax+44 1904 43 2898
E-mail seiy@york.ac.uk
www.seiy.org

SEI-Asia
Director: T. Banuri
c/o UNEP RRC.AP
Asian Institute of Technology
P.O. Box 4, Klong Luang
Pathumthani 12120, **Thailand**
Tel+66 (0) 2 524 6495, 524 5369
Fax+66 (0) 2 516 2125, 524 6233
www.sei.se/asia

ISBN 91 975238 3 6