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**SOCIAL AND ENVIRONMENTAL IMPLICATIONS  
OF RESOURCE DEVELOPMENT IN VIETNAM:  
THE CASE OF HOA BING RESERVOIR**

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**SOCIAL AND ENVIRONMENTAL IMPLICATIONS OF RESOURCE  
DEVELOPMENT IN VIETNAM :  
THE CASE OF HOA BINH RESERVOIR<sup>1</sup>**

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### ABSTRACT

Hoa Binh Dam is the most significant resource project in Vietnam and the largest hydro-electric project in Southeast Asia. The Song Da (Black River) Project, as it is otherwise known, is of national importance as the country's principal source of electrical energy, but it has also resulted in massive social and environmental impacts at a more local level. A field study of one commune indicates the extent of disruption of local livelihoods caused by the dam. Displaced farmers are having to adapt to new agro-ecological conditions and a constrained resource situation, as well as the changes brought about by the restructuring of the rural economy that is part of the country's economic reform program. Unsustainable patterns of resource use result, with implications for the livelihoods of affected communities and for the longevity of the Hoa Binh Dam. The experience of Hoa Binh is an important benchmark against which to anticipate impacts of the increased number of resource and infrastructure development projects that can be expected with growth of the Vietnamese economy consequent on the accelerated aid and investment flows expected during the 1990s and beyond. Policy implications and suggested research directions are presented by way of conclusion.

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<sup>1</sup> The field research on which this paper is based was supported by the Australian Research Council.

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**SOCIAL AND ENVIRONMENTAL IMPLICATIONS OF RESOURCE  
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## 1. INTRODUCTION

This paper is a preliminary study of the social and environmental implications<sup>2</sup> of resource development in Vietnam, based on the experience of the largest hydropower project in the country. The purpose of the paper is to examine local implications of a national development project in order better to anticipate and cater for some of the dislocations that will arise from Vietnam's present path of economic development and restructuring. These dislocations will have important effects on the livelihoods of rural dwellers, who still make up the great majority of the country's population.

The pace of change in Vietnam's rural economy matches the wider thrust of economic reform under the *Doi moi* ("renovation") version of restructuring in a socialist economy (UNDP 1990; Vo Nhan Tri 1990; Forbes et al 1991). Rural micro-level reforms are evident above all in the process of decollectivisation,<sup>3</sup> notably the move toward household based production promoted by Decree No.10.<sup>3</sup> These reforms and their implications have attracted considerable attention. Less attention has been paid to the local and broader impact of another, but related, set of changes affecting specific rural localities, namely those resulting from large scale resource development projects.

The pace of resource development in Vietnam has only recently begun to pick up, largely as a result of interest from foreign investors. In the near future it is likely that projects financed by overseas aid or multilateral lending institutions will also be promoted. It will be some time before the full implications of many of these projects become apparent, locally and more widely. However, a limited number of existing projects are of a scale and at a sufficiently advanced stage of implementation to provide indications of the impacts that may be expected as new projects come on stream. Ability to learn from the experience of existing projects, particularly regarding the nature of the social and environmental impacts engendered, together with responses to such impacts by local people and concerned authorities, is vital for understanding implications of new projects. Vietnam may also be in a position to learn from experiences of neighbouring countries where resource development has led to severe social and environmental dislocations, sometimes involving social and political conflict.

The most massive resource development project in Vietnam to date is the Hoa Binh Hydro-electric Project, sometimes referred to as the Song Da (Black River) Project, which is also the largest hydro-electric scheme in Southeast Asia. The dam and its associated reservoir are of great significance in themselves, and the project is also something of a benchmark from which to anticipate future resource project implications. Hoa Binh has transformed the electrical energy sector of northern

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2 It may be noted that this report discusses "implications" rather than limiting itself to the narrower concept of "impacts". Implications include not only direct and indirect impacts but also responses and lessons for the study, planning and management of present and future schemes.

3 Decree No. 10, April 1988 has a number of important provisions:

- Peasants are free to sell produce at market prices rather than selling to the state at depressed prices; the state's revenue is raised through agricultural taxes
- Cooperatives no longer support local party branches and authorities, reducing the non-agricultural managerial cadre levels
- Land is divided up to individual households, based both on farming potential and number of dependents
- Cooperatives have their role focused on supra-household level activities, for example irrigation

Vietnam. It has also led to the greatest combined social and environmental displacements since the end of the war.

The experience of Hoa Binh dam raises some vital questions regarding resource development in particular, and in some instances national development priorities more generally. The over-riding question is that of how the broader benefits that accrue from large scale projects can be directed in such a way as to benefit those who have to pay a heavy price in terms of lost livelihoods. Further questions arise regarding the sustainability of large projects, particularly when the combined social and environmental impacts may threaten the viability or longevity of the project itself. At a very local level, the most immediate question is how livelihoods can be best adapted within the greatly constrained resource situation faced by displaced communities.

### 1.1 Methodology

Social and environmental implications of a project of the scale of Hoa Binh exist at a number of levels. The main objective of the research behind this study was to examine in detail the changes in livelihood faced by those resettled, their responses including changed resource use patterns, the environmental consequences of these changes, and the implications of these consequences for sustainability of livelihoods and of the resource project itself (Figure 1). It was considered important also to examine indirect consequences of displacement, and this involved understanding environmental and social processes both locally and at a broader level.

The research team made two extended field trips to the dam site and a number of affected communities during April and May 1991. Semi-structured interviews were conducted with village leaders and elders in each of 15 villages (see Appendix A). Longer periods of residence were spent in selected villages, including a week in the commune of Hien Luong (see below). A number of household interviews were conducted in the villages of Luong Phong, Mai and Ngu, and basic land and resource use patterns were examined.

In addition to community level interviews and observation, meetings were held with the commune, district and provincial People's Committees and provincial and district managing boards responsible for resettlement. The focus was on the most affected district in each of the two provinces partially flooded by the reservoir (Da Bac in Ha Son Binh from which 13,000 people were displaced, and Phu Yen in Son La from which 23,000 people were displaced). This provided a basis not only for collection of objective data, but also for an insight into the very different perceptions of the difficulties faced by evacuees from the dam area at different levels. Finally, meetings with authorities at the dam site and from the Ministry of Energy in Hanoi yielded useful data.

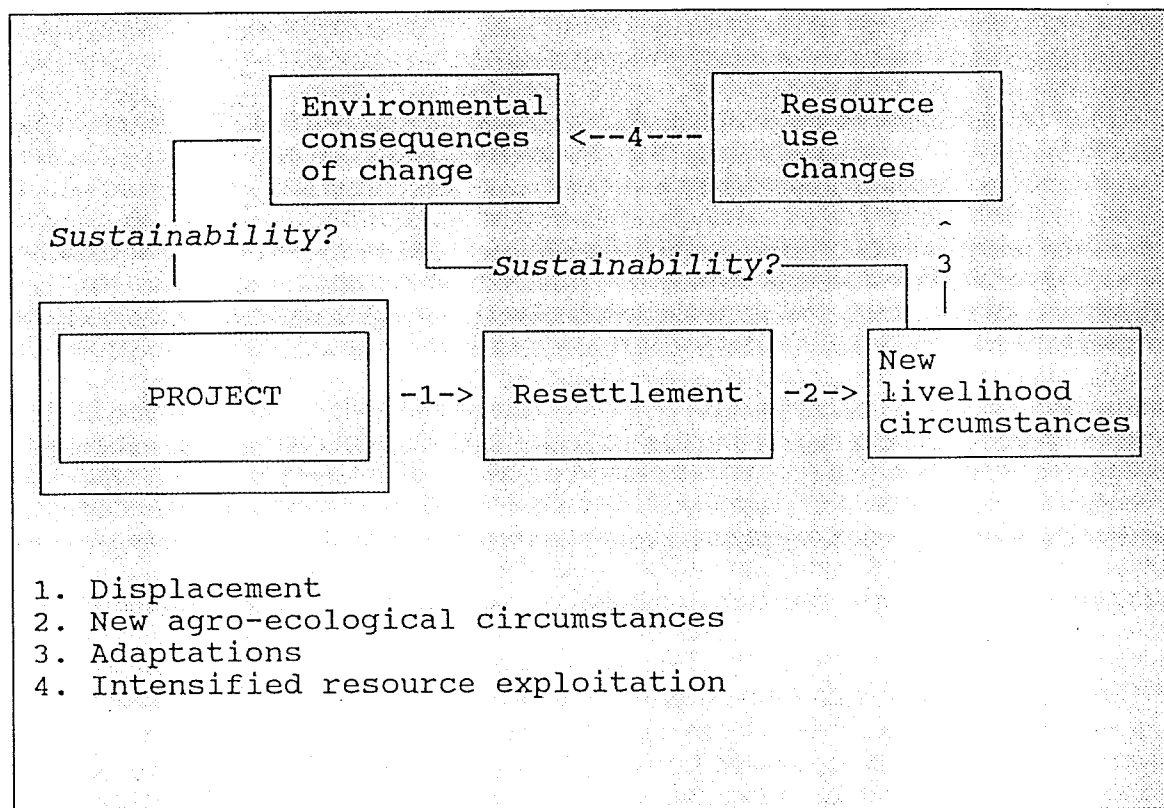
It should be stressed that, despite the considerable social and environmental problems created by the project, there is a great degree of frankness and openness shown at all levels even when discussing quite sensitive issues. It is this preparedness to come to terms with past and present shortcomings that provides a basis for learning useful lessons, and it is hoped that the present study can make at least a small contribution toward more equitable and less environmentally disruptive resource development initiatives in future.

## **2. RESOURCE DEVELOPMENT IN VIETNAM**

Development of the Vietnamese economy depends substantially on resource mobilisation and industrialisation. This involves investments in energy, mining and

FIGURE 1

Simplified research schema for investigating social and environmental impact



forestry, together with manufacturing industries that are in part dependent on natural resource development. Most large scale projects are likely to present the common dilemma of serving the national good but at the social and environmental expense of particular localities.

### 2.1 Existing and impending resource development

To date, a substantial share of direct foreign investment in Vietnam has been in the resources sector. Despite efforts by the State Committee for Cooperation and Investment to encourage foreign investment in labour-intensive manufacturing, a number of difficulties and uncertainties have slowed progress in this sector. Within the resources sector, offshore oil development has taken the lion's share, accounting for about half of all investment to 1991. However, important projects have also been put forward in forestry, coal mining and minerals development, the latter particularly in the north of the country.

It can be expected that with the lifting of the US embargo, there will be an accelerated pace of resource development activity. This will arise not only due to the subsequent entry of US and Japanese capital, but also as a result of allowing Vietnam access to international agency funding, notably that of the World Bank and IMF. Indirectly, this will involve construction of infrastructure serving resource development in remoter areas, particularly of the mountainous regions. More directly, funding of large energy and other projects will become a possibility, including further large hydropower schemes.

Figure 2 shows the major areas of existing and prospective resource development in Vietnam.

### 2.2 The economic context of resource development

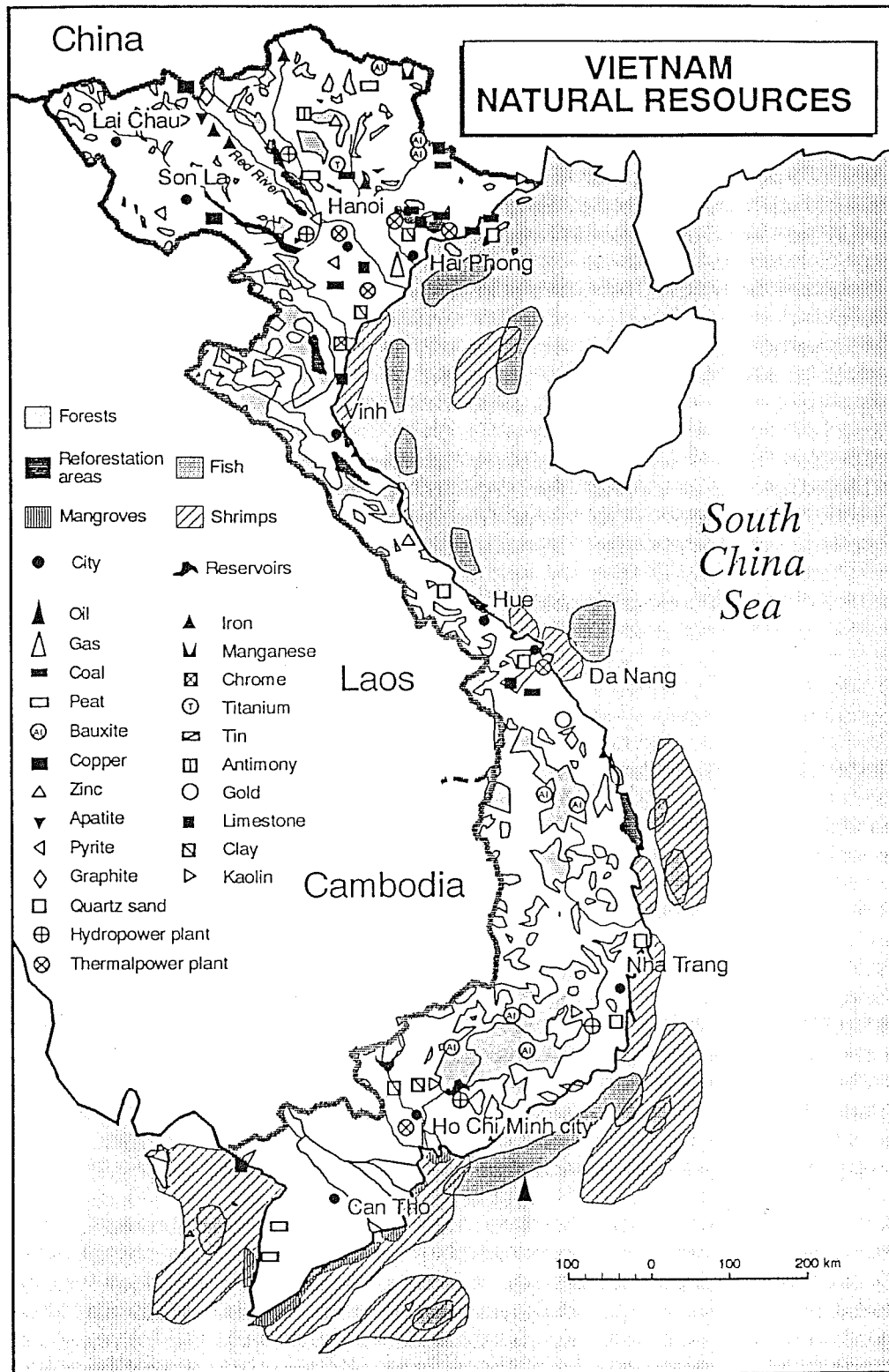
Restructuring of the Vietnamese economy has two main facets, domestic and international (Forbes et al 1991). Both have important implications for the resources sector and for the way in which impacts of resource development projects are catered for (Hirsch 1992).

In the domestic sphere, the major aspect of restructuring is the move from a command economy toward a market economy under the policy of *doi moi*, or renovation. This move has varied and far reaching implications for the rural economy, involving enterprises at a range of scales. For large scale resource projects, removal of state subsidies will mean justification of particular projects on their economic merits, which requires a substantial reorientation of the basis on which projects are assessed. In the context of a changing decision making framework, an open question is the extent to which "externalities" including social and environmental impacts will be built into costings. A related issue that requires reconsideration is the way in which compensation and resettlement is catered for under the new arrangements.

At a more local level, the move from collective to family based agricultural production implies a change in the way in which resettlement and compensation schemes operate. Centralised planning has in the past proven less than adequate, as the study of Hoa Binh presented below reveals, and with more decentralised decision making it is more vital than ever that participatory structures are set up to cater for adjustments to be made by displaced populations. On the other hand, opportunities for household level investment in new enterprises may offer more flexibility and new opportunities for adaptation to new environments, markets and production possibilities.



FIGURE 2



One indirect implication of removal of subsidies is the likelihood of greater movement to the cities by displaced populations. In the past, restrictions on movement were enforced most effectively by the operation of food and other subsidies, which were only available in the locality of registration. Removal of this material restriction on movement, combined with growth in the urban economies of the major cities, can be expected, in the absence of proper compensation and resettlement arrangements, to provoke larger numbers of internal "refugees", fuelling problems of urban overcrowding and underemployment.

The international context of restructuring is important in the sense that international capital and aid flows are likely to become dominant in large scale projects in coming years. This means on the one hand that resource development decisions will be determined at least in part by decisions made outside Vietnam, based on commodity prices and other determinants well beyond the local sphere. On the other hand, the considerable experience of dealing with social and environmental impacts gained elsewhere can be brought to bear, as can the resources available to transnational corporations and multilateral lending institutions. This latter point is important as it is clear from the experience of Hoa Binh that one of the key problems has been under-resourcing due to the extreme shortage of cash, as well as experience, to deal with the displacements caused. At the same time, it is important to recognise the locally specific considerations that mitigate against wholesale application of resettlement experience from elsewhere. Moreover, such experience has in any case often been far from satisfactory (Goldsmith and Hildyard 1984), suggesting that innovative and locally responsive means of identifying and dealing with specific resettlement options need to be developed within Vietnam.

### 2.3 Social and environmental implications

The social and environmental impacts of large scale resource development projects are almost universally more localised than the project benefits. At the same time, there may be significant external impacts that need to be taken into account, for example downstream impacts of water resource projects involving changes in watershed ecology. This paper is concerned in the main with on-site or local impacts, but many of the principles outlined can be extended to the affected areas and populations further afield.

Social impacts of large scale resource development projects are manifold. The most immediate and obvious are the direct displacements of population caused by flooding, open-cut mining or reforestation projects. It is important to take account of displacements not just of affected areas of settlement, but also of land, forest and water resources that are a part of people's livelihoods. This also helps to point the way to recognising indirect impacts, as displaced populations may encroach on the resource base of communities not immediately affected by the project.

Other social impacts may have to do with immigration of labour from outside the project area and associated problems of ethnic minorities. Many of the areas of highest resource potential in Vietnam are in regions inhabited by non-Kinh<sup>4</sup> groups, and this makes the ethnic issue particularly pertinent. The structure of local administration in Vietnam offers considerable potential for participation of ethnic minorities in resettlement planning, since the People's Committees<sup>5</sup> are normally representative of local populations. However, where communities are displaced to a new commune or district, this may result in the migrant community being effectively disenfranchised on the local People's Committees in the first instance.

4 Kinh is the term for lowland ethnic Vietnamese.

5 People's committees are the political-administrative organs at commune, district, province and municipal level.

It is difficult to separate environmental from social impacts when livelihoods are dependent in large part on agriculture and use of forest products. A general feature of resource development projects is appropriation of part of the local resource base, which means that local communities are often forced to intensify their use of remaining resources. Depending on the opportunities for adaptation to the new resource situation, such intensification may lead to unsustainable livelihood patterns in the struggle to meet basic survival needs. Ultimately this may affect the viability not only of affected communities but also of the resource project itself, as in the case of Hoa Binh.<sup>6</sup>

### 3. HOA BINH HYDRO-ELECTRIC SCHEME

Hoa Binh dam is a clear example of a situation where intensification of resource use for national development has resulted in a greatly constrained local resource situation, although in this case over an exceptionally wide area. It is a case not just of conflicts between developmental and environmental objectives, but also of dilemmas created out of contradictions between national and local interests that have not been properly addressed by compensation mechanisms.

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<sup>6</sup> It should be noted that it is not only the physical longevity or viability of resource projects that is vulnerable to feedbacks from displaced populations. The socio-political viability of projects is equally important, as can be seen from the case of Bougainville in Papua New Guinea (where the Panguna copper mine was closed down) or several dam projects in Thailand, which have not got off the ground because of conflict engendered by insensitive planning and the poor performance of past resettlement schemes.

## BOX 1 : HOA BINH HYDRO-ELECTRIC PROJECT - SOME BASIC DATA

### 1. Watershed (see Figure 3)

Basin area (in Vietnam; remainder in China) : 2,586,000 ha  
 Basin provinces : Lai Chau, Son La, Hoang Lien Son, Ha Son Binh  
 Watershed protection area : 800,000 ha (31%)  
 Forested area : 152,000 ha (6%)  
 Population : 1,183,686  
 Ethnic groups : 20 including Kinh, Thai, Muong, Hmong, Dao  
 Soil erosion : Average 32 tonnes per ha per annum (est.)

### 2. Reservoir data

Reservoir capacity : 9.5 billion m<sup>3</sup>  
 Reservoir length : 230 km  
 Reservoir area : 200 km<sup>2</sup>  
 Reservoir shoreline : 770 km  
 Normal FSL (September) : 115 m above m.s.l.  
 Maximum drawdown : 35 m  
 Normal drawdown (June) : 25 m  
 Expected energy output : 8.4 billion kWh per annum  
 Maximum normal water flow rate : 15,000 m<sup>3</sup> / s  
 Water flow rate to power all 8 turbines : 2,400 m<sup>3</sup> / s  
 Flood provision : 1:10,000 years; 38,800 m<sup>3</sup> / s  
 Planned dry season base flow (March) : 230 m<sup>3</sup> / s  
 Actual dry season base flow (March) : 180 m<sup>3</sup> / s  
 Annual sediment intake : 62 million tonnes

### 3. Impacts of reservoir

Population displaced : 58,000  
 Towns flooded : Cho Bo, Van Yen, Suoi Rut  
 Area of agricultural flooded : 11,000 ha  
 Area of riceland flooded : 5,000 ha

### 3.1 Background

Hoa Binh dam is the largest hydro-electric project in Southeast Asia. The project was constructed with financial and technical assistance from the USSR. The dam provides for a maximum head of nearly 100m, with an eventual maximum generating power capacity of 1920 MW and theoretical energy capacity of 11,000 GwH per annum.<sup>7</sup> This makes the dam more than four times the size of the country's next largest project, Tri An in the South.

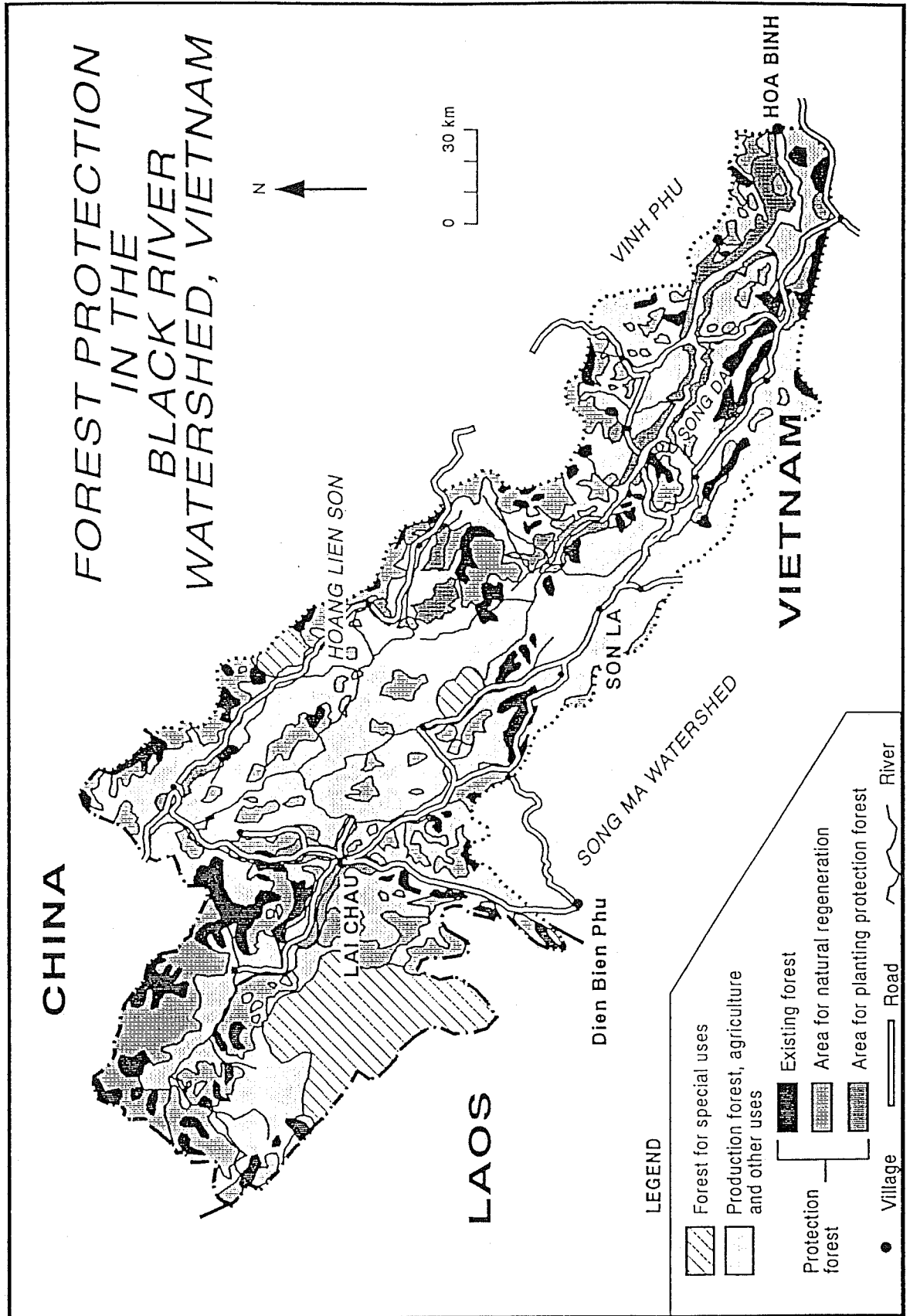
The hard currency costs of the dam are extremely difficult to measure in dollar equivalents, due to high rates of inflation and discrepancies between official and unofficial exchange rates. However, rough estimates put the costs at about US\$1.5 billion, a figure the Ministry of Energy points to as favourable in international terms measured in dollars per kilowatt. Planning for the dam started in 1971, construction commenced in 1979, and installation of the final turbine is scheduled for 1994. For

<sup>7</sup> Interviews with the management of the dam suggest that actual energy potential is some 27 per cent less, due to the need to cater for flood protection by reducing reservoir levels early in the summer wet season.

FIGURE 3

PH759mg HS=700 10/9/91 B Rot.ON Pattern ON Resolution STD SWAP B/W

UNIVERSITY OF SYDNEY  
*Cartography*



purposes of social and environmental impact, however, the project can be considered complete as of 1991.

Hoa Binh dam is located on the Black River, or Song Da, 75 km west of Hanoi and 2 km upstream of the district town of Hoa Binh in Ha Son Binh province (Figure 4). The reservoir behind the dam reached its maximum normal level of 115m in 1991. Table 1 shows the levels reached before that date. Potentially the water level may reach 120m. The normal maximum level creates a reservoir extending 230 km upstream from the dam, in a long and narrow area reflecting the steep topography of the Black River and its tributaries flooded by the project. The reservoir shoreline is 770 km and the volume some 9.5 billion m<sup>3</sup>.

Before 1988, when the first turbine came into operation at Hoa Binh, Hanoi and other cities of northern Vietnam had daily electricity blackouts of several hours. By mid-1991, when three of the eight 240 MW turbines had been installed, the northern cities had a reasonably predictable 24 hour supply. Ironically, the increased capacity coincides with the reduction in subsidies and associated steep rises in unit charges,<sup>8</sup> which have reduced domestic electricity consumption as some consumers have switched back to charcoal for cooking, and contributed to a surplus of generating capacity with fewer than half the Hoa Binh turbines in place.<sup>9</sup>

Table 1

Maximum water levels of reservoir

1982	23 m (Dam sealed)
1983	43 m
1985	60 m
1986	81 m
1987	95 m
1988	102 m
1991	115 m

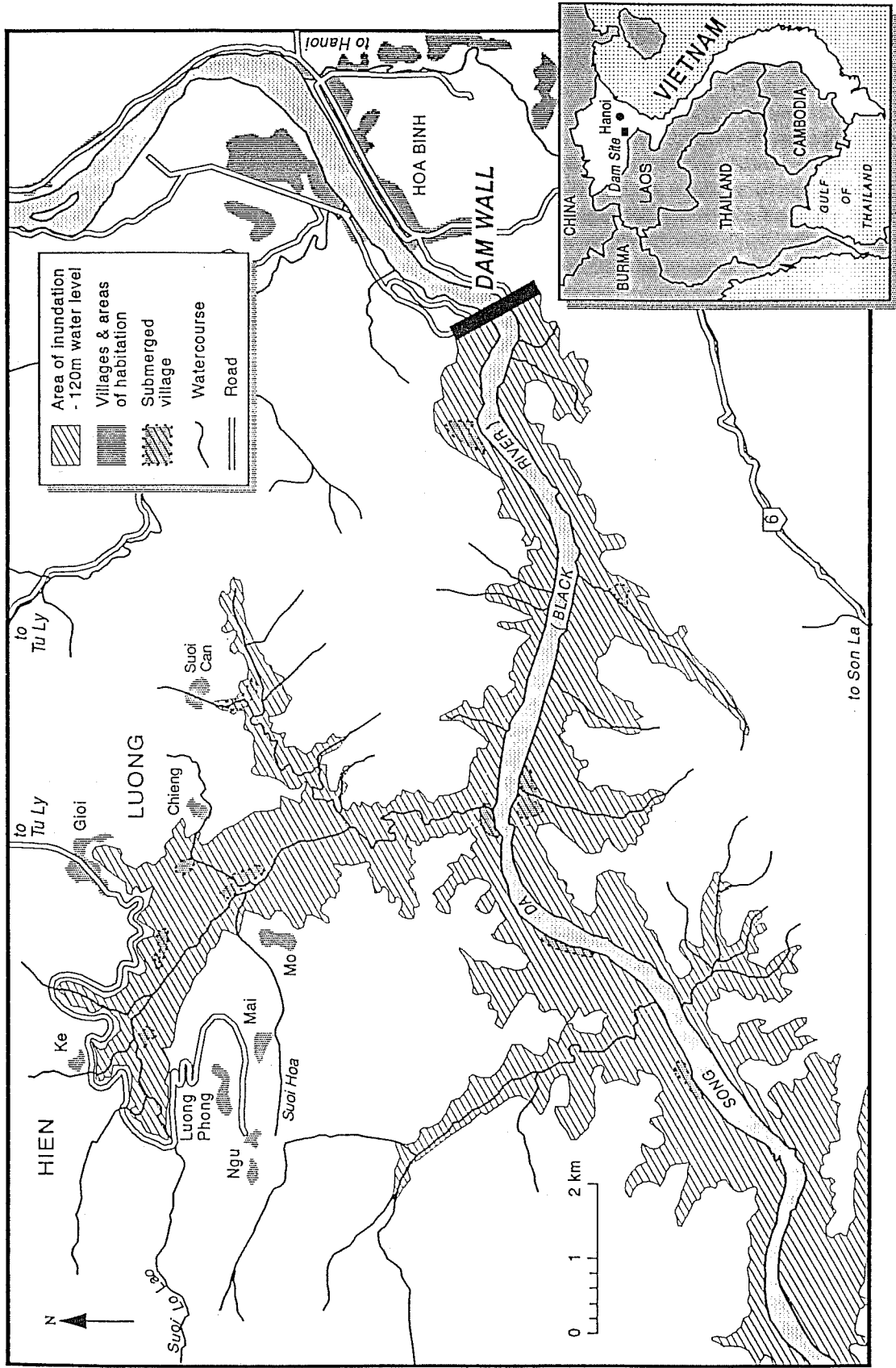
Other than electricity generation - the primary function of the project - flood control and supplementary irrigation of about 30,000 ha in the Red River Delta downstream of the dam are also significant benefits.<sup>10</sup> A generalisation can therefore be made that the principal and major benefits of this large project are downstream of the dam, while most of the costs have been borne by displaced populations upstream. An estimated 58,000 people had to move their homes and lost some or all of their agricultural land under the reservoir. A larger number of people have been affected as a result of encroachment of displaced populations on forest, land and water resources.

8 In 1991, Hanoi consumers were charged 250 *dong* per kWh. While still well below average production costs, this represents a high unit charge when monthly salaries are typically only a few tens of thousands of *dong*. [In mid-1991, the US dollar was worth approximately 7,000 *dong*.

9 There are plans to build a US\$260 million power line linking the grid in the North to that of the South, which will help to solve the problem of surplus capacity from Hoa Binh as well as the power shortages in Ho Chi Minh City. Brownouts are already a regular feature of life in the South, and per capita electricity consumption is forecast to triple between 1990 and 2000 to about 500 kWh; demand in the North is considerably lower, but also forecast to increase rapidly.

10 Little study has been made of downstream impacts, but there is some concern among Vietnamese researchers that the irrigation and flood control benefits may be offset at least in part by the existing system of dikes. This means that a higher and more regular water level downstream may flood some previously cultivable land outside the dikes during the dry season, and even possibly undermine foundations of dikes due to the longer period of inundation that results from evened out flows. A great deal more study of downstream effects is urgently required.

FIGURE 4



LOCATION MAP

PH7539mg  
HS=800 15/8/91A (14/4/92)ATB

### 3.2 Social and environmental impacts

A number of research institutes in Hanoi have been investigating a range of impacts associated with the Hoa Binh dam. The most comprehensive study of the bio-physical environmental impact is being carried out by the Centre for Natural Resources and Remote Sensing at the National Centre for Scientific Research. This project involves the mapping of a range of environmental variables in the immediate reservoir area and the wider watershed. The ultimate objective of this project is to devise a rational land use plan for the watershed. There have been only limited linkages with researchers working on the ground, notably the project being run from the Institute of Economics, Commission for Social Sciences, on the social and economic conditions of communities affected by the Hoa Binh dam.

Most of the affected populations are members of ethnic minority groups. The major groups affected are Muong, Tay, White Thai and Black Thai. Indirectly, Hmong and Dao communities living close to the reservoir have been affected as evacuees have been forced to encroach on nearby forest, land and water resources.<sup>11</sup> Most of those displaced have lost fertile wet-riceland,<sup>12</sup> and few have been able to establish similar livelihoods elsewhere. Evacuees are surviving by cultivation of often very steep dryland for maize and cassava, by sale of wood and bamboo, and by collection of a variety of forest products such as bamboo shoots and mushrooms. In some cases, legumes including mung beans, soya beans and groundnuts are also cultivated, as are sweet potatoes and perennials such as tea and apricot trees.

For most of those displaced by the reservoir, the final irony is that they are without electric light or other benefits created by the dam. Fieldwork encounters included one elderly man living less than 20 km from the dam who had never in his life seen an electric light; a village leader some 100 km upstream of the dam who keeps an electric bulb hanging from a piece of string stretched between rafters, claims sardonically to be "waiting for electricity"; and the majority of villagers who have never seen the dam that has so transformed their lives. Only the district town of Tu Ly has received electricity from the dam. Water shortage is a serious problem facing many resettled communities.

Educational and health standards appear to have suffered significantly in most of the areas visited. In several communities visited that are now located at the reservoir edge, the nearest primary school is several kilometers away by rowing boat. Many children either do not attend school or have a long, arduous and sometimes dangerous journey to school.<sup>13</sup> The resultant illiteracy among the new generation of children in many communities is a major concern among a population which places a very high value on education.<sup>14</sup> Likewise, inaccessibility of health centres exacerbates the health problems created both by increased levels of poverty and by new environmental health hazards such as lack of latrines and breeding grounds for malarial mosquitoes, so that parasitic diseases and malaria have increased markedly since the flooding. Poor diet and sanitation has led to resurgence of diseases such as dysentery and goitre.

11 The district People's Committee of Yen Chau District, at some distance from the reservoir, reports that 150 Hmong shifting cultivators whose lands were encroached upon by dam evacuees have come into the district and cut forest, indicating a chain of displacements.

12 Muong and Thai villagers in Phu Yen district have several songs that relate the fertility of the Song Da valley and the relative wealth of the communities who live there.

13 A small boat overturned in 1989 on the way back to the village of Mo from school in Gioi and some children drowned.

14 In some cases, even those who have not moved have suffered from decreased accessibility. For example the village of Lang Chom used to have a teacher before the reservoir flooded the main road (Route No. 6) but has not had one since, so that now most village children are illiterate.



Environmental impact is very closely related to social dislocation. Force of circumstance has resulted in rapid clearing of steep hillsides along most of the reservoir edge, resulting in deforestation and associated soil erosion, leading to accelerated siltation of the reservoir. Annual erosion rates on newly cleared slopes near the reservoir as high as 70-150 tonnes per hectare have been estimated. The projected life of the dam itself has been reduced from more than 100 years in original plans to an estimate of about 50 years as a result of higher than expected sediment loads carried into the reservoir.

Another factor leading to increased rates of forest loss is the accessibility afforded by the reservoir itself and new roads. Piles of wood, awaiting sale, are stacked by roadsides and there is a regular stream of rafted wood being towed along the reservoir for sale at Hoa Binh. Several villages visited had wood stacked at the reservoir edge for collection and sale.

The loss of forest and competition for water and land resources has had an impact not just on resettled communities, but also on neighbouring villages. Most of the villagers in the vicinity of the reservoir depend on local environments for their livelihoods, and disruption of the existing balance, as described below, has caused extended hardship and breakdown in local systems of resource management.

### 3.3 Resettlement and compensation

Some 58,000 people belonging to 9305 households in nine districts of two provinces have had to move as a result of the inundation from Hoa Binh dam. 11,000 ha of agricultural land were flooded, including 5,000 ha of wet-riceland. Of the total, about 1,400 ha are in Phu Yen alone, and this represents about one-tenth of the entire wet-riceland area of Son La province. In Da Bac, 600 ha of wet-riceland were flooded, representing about half of the district total. All 500 households in the district town of Da Bac district, Cho Bo, were moved to Tu Ly from 1982, and the towns of Suoi Rut and Van Yen were also flooded. Only very limited areas of wet-riceland were available in new settlement areas.<sup>15</sup>

Resettlement of those whose land and homes have been flooded by the Hoa Binh Reservoir is the responsibility of provincial level Managing Boards (Box 2). The Boards were established by the Ministry of Energy and provincial authorities in an effort to decentralise decision making and so maximise the use of local knowledge and expertise. Resettlement planning commenced as early as 1976. However, a number of factors have greatly reduced the effectiveness of the resettlement and compensation schemes.

#### BOX 2 : MANAGING BOARDS FOR SONG DA PROJECT

Ministry of Forestry  
 Ministry of Irrigation  
 Ministry of Energy  
 Ministry of Agriculture  
 Provincial authorities

<sup>15</sup> The Ha Son Binh provincial Managing Board for resettlement reported that only 200 ha of wet-riceland could be found for the evacuees, averaging 500 m<sup>2</sup> per household; it was also noted with some irony that during the struggle against the French, there was an anti-colonial slogan that spoke of the hardship of farmers who had less than 1000 m<sup>2</sup> per household!

An initial problem is that of under-resourcing. Per capita resettlement expenditures have been extremely low, reflecting the very limited resources available in Vietnam's constrained economic circumstances. Despite the straitened exchequer, however, it might be expected that a higher proportion of total project costs might have been diverted to catering for direct project impacts than has been the case.

Those funds that were allocated have had only marginal effectiveness in alleviating the hardships faced by evacuees. The compensation package has been applied in successive stages, each following on from failures associated with the previous one. In 1983 families were granted resettlement costs based on surveys of assets. However, most families were unable to gain immediate access to their entitlements, which were instead banked. In September 1985 the currency reform effectively wiped out 90 per cent of the value of banked funds, so that for example a payment of 3,000 *dong* was reduced to 300 *dong*, an amount that is now meaningless (three US cents in 1991). Hyperinflation clearly makes any non-indexed cash compensation problematic.

A second stage of cash compensation was given to families who moved after 1988, but most families found the amounts insufficient even to cover even basic removal expenses. Lost assets and the costs associated with recreating a livelihood were not catered for at all. A third stage is anticipated, with funds allocated in 1991 for household level investments, but there have been delays in implementing the new package and there are again concerns over dissipation of value (initially about US\$150 per household) by the time monies become available. In principle it is much easier to channel funds directly to individual households since the promulgation of Decree No. 10 (see above), but in practice bureaucratic procedure still leads to considerable delays.

Compensation in kind was administered by the managing boards, but it has been subject to over-centralised bureaucratic management. In the case of Ha Son Binh, compensation was given in the form of sugar cane, following a provincial level decision that sugar was a suitable crop for dam evacuees. This decision was based on the successful experience of one commune (Tan Dan) with sugar. However, a combination of poor quality stalks and unsuitable conditions in most of the resettled communities led to a general failure of this crop, which has resulted in bitterness and cynicism among affected farmers.

A considerable proportion of available funds has gone into resettlement provision rather than direct compensation. New resettlement sites were established at a number of locations at some distance from the reservoir, usually in elevated areas. Construction of roads to replace those flooded and to make resettlement sites accessible required heavy expenditure, as did schools, clinics and other social infrastructure. Irrigation schemes have been built in some upland resettlement areas, but with very limited effectiveness. Once again, overly centralised planning with little local involvement has resulted in ineffective or wasteful expenditure of scarce funds.

As a result of the difficulties of establishing new resettlement areas, together with conflicts over land and other resources between evacuees and people already living in or near the resettlement areas, only a small proportion have chosen to establish themselves there permanently. The Managing Boards responsible for resettlement estimate that about three-quarters of those whose lands and homes were flooded continue to live at or near the edge of the reservoir, farming the adjacent steep land.

The latest resettlement alternative is the movement in April 1991 of some 30 families from the district of Da Bac to a New Economic Zone some 1500 km away in Long An province in the southern part of the country, near the border with Cambodia, following 20 who had moved the previous year. These families have received a relocation allowance. For Muong people this is quite a drastic step, but one which an increasing number are requesting as a result of the difficulties being faced. More than 400

households in Ha Son Binh province have requested such a move, but to date administrative procedures, including government policy to keep people in the highlands, have precluded a larger scale move. There is a perception among local people that the provincial authorities do not want to lose population.

#### 4. LOCAL IMPLICATIONS : THE CASE OF HIEN LUONG

Hien Luong is a commune of eight villages in Da Bac district of Ha Son Binh province (Figure 4). For a brief period after 1978, the eight village cooperatives were amalgamated into one, Luong Hoa, but in 1981 they were once again divided pending resettlement. Da Bac was one of the districts most extensively affected by the Hoa Binh dam. Hien Luong was affected both by flooding and by the resettlement of evacuees from other communes. The experience of the commune thus shows both direct and indirect effects of the resettlement on local livelihoods. It is worth noting that being only 10 - 20 km from Hoa Binh, Hien Luong villages are more accessible than most of those affected by the dam, so that the problems described may in some ways be less severe than those found in more distant areas.

The communities under discussion fall into three main categories. First, there are the communities of Gioi, Ke and Mo which were flooded by the reservoir and had to move up above the high water line of 120m. In all three cases the communities are close to the original location of settlement, and in some cases are farming land that was previously used for supplementary dryland cropping. In these cases, new forest clearance has been necessary to make up for loss in ricelands. Second is the village of Luong Phong, a community that moved from outside the commune as a result of limited opportunities for resettlement nearby the flooded villages from which its members came. Third are the villages of Mai and Ngu, neither of which has had to move as a result of flooding since both are located well above the reservoir, but both of which have been affected by the resettlement of people to Luong Phong. The village of Ngu is a Dao village, and all the other villages of Hien Luong are of Muong ethnicity.

##### 4.1 Previous livelihoods

The Muong communities of Hien Luong had experienced previous hardship under the French, and also under the traditional system of *Lang dao*, the old Muong aristocracy whose exploitative nature was boosted by colonial rule. Following the Viet Minh victory in 1954 and collectivisation of agriculture into cooperatives, most families experienced a substantial improvement in living standards. This history of improvement is significant as a backdrop against which people now see a reversal of progress in their livelihood opportunities. In several interviews, people commented independently that it had never been this hard, even under the French.

Prior to flooding, members of all three groups of communities had more predictable and substantial production opportunities than they have subsequently. Most were wet-rice farmers working land collectively, and buffalo were owned by the cooperative, typically in numbers similar to, or slightly less than, the number of member households. The valley floor riceland was fertile and irrigable, typically giving combined annual yields from two crops (*Dong-Xuan* [Winter-Spring] and *He-Thu* [Summer-Autumn]) of at least 4 and up to 8-9 tons per hectare. Most Hien Luong residents report having had sufficient rice throughout the year before construction of the dam.

Rice farming was supplemented with dryland shifting cultivation on slopes above the valley floor, mainly of maize and cassava. Banana and longan orchards provided additional income, as did individually worked kitchen gardens. Typically a household

would have about 1000 m<sup>2</sup> to work privately, and this was cultivated intensively. Livestock included buffalo and poultry, while fish ponds and river fishing provided additional sources of food.

#### 4.2 The process of resettlement

Resettlement from the Hoa Binh Reservoir took two main forms, both represented in Hien Luong. The first was movement to a new, officially designated resettlement area at some distance from the original village. Such areas were sometimes provided with basic infrastructure in the form of road access and irrigation facilities. In the case of Hien Luong, a road was built to service Luong Phong, Mai and Ngu and irrigation was promised but has yet to be provided.

The second pattern of resettlement was a step-by-step movement by communities as the water level rose. Despite official disapproval and no legal recognition of rights to settle or cultivate land at the reservoir edge, this was much more common than permanent movement to new areas away from the reservoir. A combination of factors contributed to this pattern. First was a reluctance to move further than necessary from the home community. Second was a general disbelief that water levels would in fact rise to the levels indicated by the authorities, which meant that households tended to move up to levels expected to escape flooding, only to be forced upward again as the water rose during the 1980s.<sup>16</sup> A third factor was the need to be near water for transport and other uses, precluding a one-off move to the permanent site for resettlement. Most step-by-step settlers have had to move two, three or more times, adding to the cost of dislocation.<sup>17</sup> Because the fields and orchards on which they depended prior to flooding were so much more fertile and productive than the steep and dry land onto which they moved, most families preferred to delay abandonment to the latest possible time. In some cases this meant losing assets that could not be transported in time to escape the rising level of the reservoir. In Phu Yen district, some families were still planting crops at the reservoir edge in early 1991, risking their loss if the water level rose to its maximum too quickly.

For most households, the costs of moving greatly exceeded the compensation received for that purpose. Families received 160,000 *dong* (80,000 *dong* for secondary households), together with rice rations for six months, in removal expenses<sup>18</sup> but the actual cost of moving has been of the order of 1 million *dong* or more. Most families sold livestock and other household assets to effect the move. It is immediately apparent that those who have moved any distance are living in smaller and less sturdy houses than those living in or near established communities.

In fact, many who initially moved some distance to officially designated resettlement sites have since returned to areas close to the reservoir edge. Factors influencing their return include difficulties of making a livelihood in the new area, lack of water, ineffectiveness of promised services such as irrigation, shortage of land suitable for cultivation and lack of services such as a school and health centre. In many cases, access to land was the major problem where the designated resettlement areas

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16 An official of the Ministry of Energy explains this as being due to the need to warn villagers a year in advance of the maximum level to which the reservoir might rise in case of a 1:100 year flood, so that when this failed to materialise many became complacent and believed the water would never rise to the level indicated.

17 Several displaced villagers relate the Vietnamese proverb, "moving three times is equivalent to being burnt out" to illustrate the hardship involved.

18 In fact, those who moved earlier did not receive this entitlement, and there is general resentment among this group that others were in effect rewarded for staying put for as long as possible.

overlapped with existing communities. Compensation payments were nowhere near sufficient for purchase of land leasing rights from existing communities.<sup>19</sup>

An important part of the resettlement process is the breakup of agricultural collectives. By the time resettlement began in 1983, some aspects of decollectivisation had already begun, particularly after the reforms of 1979 (see Beresford 1988). However, the movement and scattering of flooded communities effectively spelt the death knell for the remaining cooperative farming, and individual households are very much on their own in the new communities of Hien Luong. Cooperatives maintain a role in conflict resolution and administration of external resources. The cooperative also maintains nominal control over land allocation.

One of the more successful programs in Hien Luong that has gone some way to helping people cope with adjustment is the World Food Program tree planting scheme, known locally as PAM (from the French acronym). Under PAM in Hien Luong, farmers are assisted in planting acacias, eucalypts and leucaena. The program is administered through the district at Tu Ly and affords 260 kg of rice per family for the first year, 170 kg for the second, and 130 kg for the third year for planting one hectare of trees. Intercropping is possible for up to three years. The program thus helps to reforest hillsides, provides an eventual source of fuelwood, fodder and cash income, and provides for at least some immediate food needs as well as cash crops in the first instance. By the end of 1990, some 130 ha had been planted in Da Bac district under the PAM program.<sup>20</sup>

#### 4.3 Environmental and social impact : the Luong Phong experience

The village of Luong Phong (Figures 4 and 5) is a resettlement area for 63 households displaced from a number of locales since 1988. The village is a Muong community. Previously those who were resettled worked fertile wet-rice land, achieving yields of up to 9 tons of paddy from two crops per year. Their original settlements also had easy access to nearby forest resources and a reliable water supply. At present, villagers are eking out a living on a limited area of steep land that has been cleared for dryland farming. There is only a limited degree of access to nearby forests, which in any case have been severely degraded. Water supply is a problem. There is insufficient land for grazing buffalo and cattle, and food for pigs is hard to find.

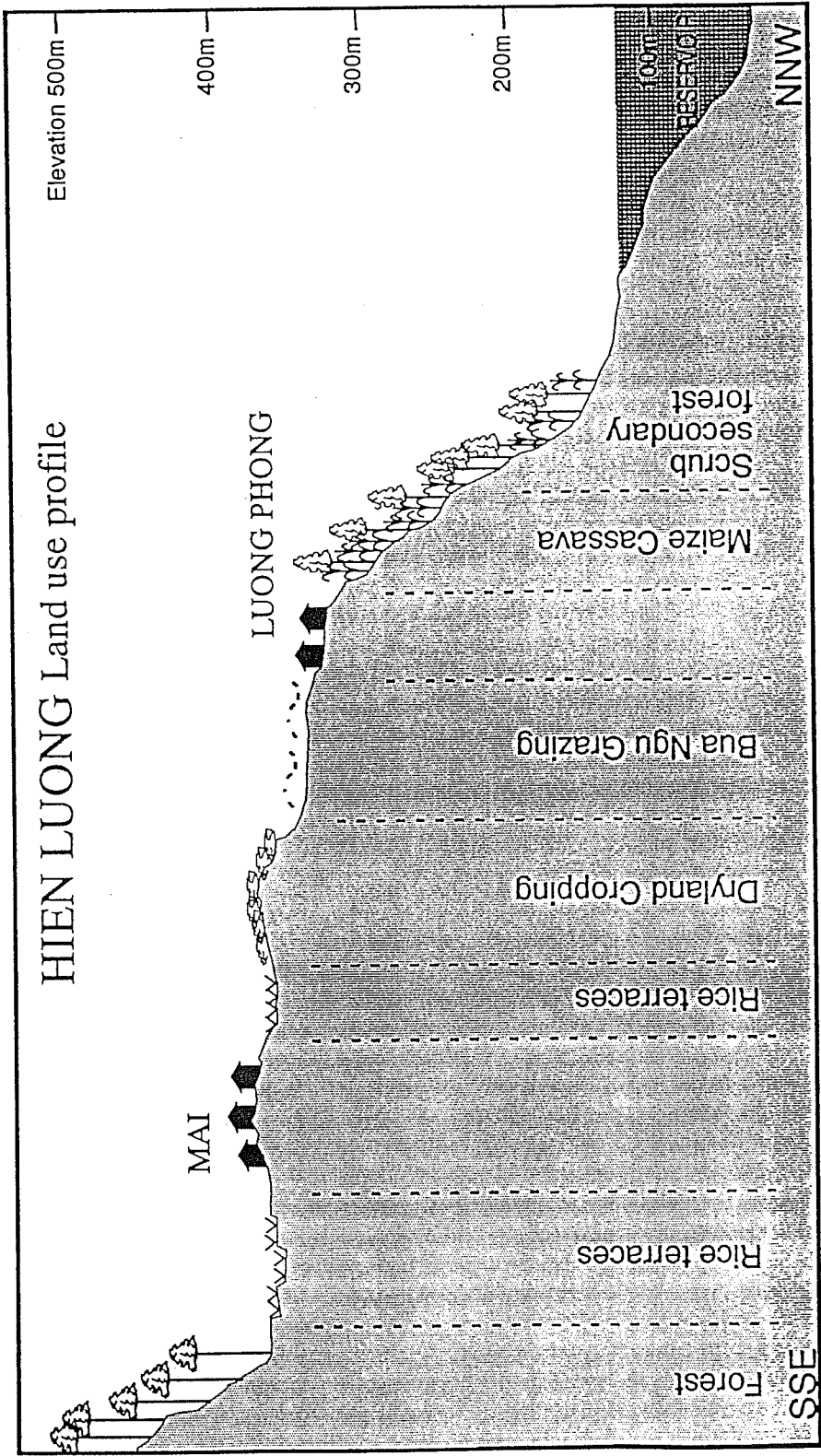
Initially, a small group of villagers whose homes were about to be flooded in 1987 came to the People's Committee of Hien Luong and also the village of Mai, where they knew some fellow ex-servicemen, to negotiate relocation of up to about 30 households onto an area of unoccupied land at what is now Luong Phong.<sup>21</sup> The district People's Committee was also party to the agreement to allocate some 7 ha of land for the new

<sup>19</sup> Officially there is no land market, but in practice even provincial and district officials acknowledge valuations of riceland (4.8 million *dong* per ha in Phu Yen in 1991) and thereby tacitly indicate an emerging tradable value for land. Some of those who resettled in previously occupied areas paid compensation to local landholders.

<sup>20</sup> Ha Son Binh is one of the four provinces covered by the PAM program, which excludes Son La province. In Son La the Ministry of Forestry has a comparable program, but remuneration for tree planting is in cash rather than rice. This has resulted in a less successful program, as the 700,000 *dong* per hectare works out as only about 700 *dong* per day's work, well below the 3,000 *dong* that might be considered a standard daily wage in 1991. The reason for the discrepancy is due both to inflation and to unrealistically high estimates of tree survival rates (85 percent, compared with actual 54 percent). This is another example of the inflexibilities of a bureaucratic structure failing to keep up with the realities created by a hyper-inflationary economy.

<sup>21</sup> Originally those who have settled at Luong Phong were supposed to move to the officially designated resettlement area of Cao Son, but lack of infrastructure provision and access to productive land prevented permanent settlement there of the designated population.

FIGURE 5



UNIVERSITY OF SYDNEY  
*Cartography*

ph7612mg HS=800 30/9/91 B Rot.ON Pattern ON Resolution A4 SWAP B/W

community. Initially, neighbouring villagers were sympathetic and welcoming, helping the newcomers settle in. However, the two neighbouring villages, Mai and Ngu, have since been increasingly affected by the arrival of the newcomers. Mai is also a Muong community, while Ngu is mainly Dao. Forest resources and land available for agriculture have been placed under pressure by the arrival of larger numbers of newcomers in Luong Phong than anticipated. As a result, tensions have built up between the communities, exacerbating the already constrained resource situation.

Luong Phong villagers originate from four communes : Tan Phong and Tan Dan in Da Bac district, and Tan Mai and Phuc San in Mai Chau district. All those interviewed face more difficult conditions than they did prior to flooding, and about a quarter of the 63 households intend to move elsewhere if possible.

Resettlement involved much more than a change of place of residence. It also meant a fundamental change of livelihood patterns and corresponding changes in resource use. The environmental and social impacts of these changes are closely inter-related, so are discussed together here.

The most basic and near universal change faced by resettled communities is a move away from wet-rice cultivation to the farming of dryland on steep slopes. This involves much more than a change of crop. With the loss of wet-riceland, buffalo became largely redundant as draught animals. In many cases they were sold in order to help pay for removal expenses, but also because there is little vacant grazing land in the new resettlement areas.

Most slopes near the reservoir, and many at a considerable distance, have been cleared for cultivation of dry rice, cassava and maize. Some of the slopes being farmed are very steep, of the order of 35°. Soil is fully exposed and subject to rapid erosion. Loss of fertility means that new areas have to be cleared, and low yields means that incomes are supplemented by cutting of wood and bamboo for sale.

There is a strong sense among the Muong farmers of having moved "backward" in civilisation terms as a consequence of the shift from intensive to extensive forms of cultivation. This is a significant complaint for an ethnic group that is commonly recognised as the proto-Kinh, the fore-runner for modern day Vietnamese civilisation. There is also a commonly expressed sense of grievance at having sacrificed their lands and livelihoods for the wider community, for national development, and having received very little in return.

One of the social impacts of resettlement that has received relatively little attention by the authorities, but is of great significance to local people, is the flooding of Muong grave sites. Many of the householders interviewed in Luong Phong independently raised this as one of the more traumatic effects of resettlement. In the early 1980s, 25 *dong* (then equivalent to 4 kg of rice) was paid in compensation for each grave site flooded. Although most graves were moved to a level above the reservoir high water level, none has been brought to Luong Phong. In addition to the high cost of such removal, villagers say that they themselves have not established a firm livelihood there, so would not think of laying their ancestors to rest in what is still a transient home. In some cases, sickness and other aspects of misfortune are explained by the sacrilegious disturbance of ancestors' original burial sites.

Similarly, house sites have not been properly and permanently established. In Muong geomancy practice, the orientation of a house is important for the well-being of the family. Lack of time and resources for house construction and proper ceremonial means that these traditions have not been followed in Luong Phong, and this is another area detrimental to the well-being of the community.

The contrast between living standard prior to and following resettlement to Luong Phong is clearly evident in house construction and furnishings. Most of the houses are small, rickety and built of bamboo and other impermanent materials. Unlike traditional Muong houses, some Luong Phong houses are not even raised on stilts, so that they have an earthen instead of wooden floor. Yet indoors, many have solid furniture and other household items salvaged from a more prosperous time, for example solid wooden beds and cupboards.<sup>22</sup>

The diet of most Luong Phong households is extremely poor. Most report having had enough rice to last 12 months of the year prior to flooding and resettlement. Few now have more than 2-3 months' supply. The staples are maize and cassava, but even these inferior foods are in short supply due to the limited area and infertility of cultivable land to which villagers have access. As a result, forest foods such as wild yams now provide the only starch and carbohydrate staple for periods up to several months of the year, with few supplementary foods during this time other than a few vegetables. There is a descending hierarchy of preferred staples, from rice through maize, cassava, to the wild yams known locally as *cu mai* (*oppositifolius* yam) and the bitter *cu nau* (tinctorial yam), in that order.<sup>23</sup> Even the latter are getting harder to find, involving a walk of several kilometres and having to dig up to 3 metres deep. Some farmers complain that cassava and yams give insufficient strength for working in the fields. Malnutrition is clearly evident from casual observation of young children (very thin arms and legs, distended bellies), despite the fact that most of the little rice that is available is fed to children. Malnutrition may be exacerbated by the need for adult members to spend long hours at distant fields or foraging away from home, leaving infants in the care of older siblings, reducing the opportunities for extended breast feeding. Water is also a major problem in the elevated position of Luong Phong. For several months of the year, there is no water supply in the village and water has to be carried from long distances. Villagers see an irony in the water shortage they face as a result of flooding.

The level of poverty means that important events such as New Year have lost their social importance for the residents of Luong Phong. Without food surpluses, the mutual hospitality and celebrations of *Tet* are lost, to say nothing of the rest of the year. Neighbouring villages continue to celebrate *Tet*. Overall morale is extremely low within the community. This is exacerbated by the multiple origins of Luong Phong villagers, making community building all the more important.

Even the poor livelihood in Luong Phong is unsustainable under current patterns of resource use. Indications of unsustainability encountered by the research team included consumption of seed grain, reports of having to travel ever longer distances for a variety of forest products such as wild yams and bamboo shoots, increasingly seasonal stream flow, shortened field rotations among those practising rotational shifting cultivation, and declining yields on the steep slopes being farmed.<sup>24</sup> Some success has nevertheless been achieved with crop rotations including nitrogen fixing legumes such as soybean and mung bean.

In summary, the case of Luong Phong serves to exemplify many of the direct and indirect social and environmental problems arising as a result of displacement by the Hoa Binh reservoir. Adaptation of villagers from a productive lowland system of agriculture to a tenuous upland system, destruction of forest for agricultural land and

22 In ethnic Thai villages in Phu Yen district, this contrast is even starker, as many of the houses have a relatively affluent appearance with tiled roofs, yet villagers face severe shortages of food and other basic necessities as in Luong Phong.

23 Prior to resettlement, farmers now living in Luong Phong would only have had to survive on forest foods when serving in the army during the wars against the French and the Americans.

24 For example, some farmers report upland rice yield declines from 1.1 - 1.2 tonnes per ha in the first year, to 0.7 - 0.8 t/ha in the second year, and as low as 0.2-0.4 t/ha by the third year of cultivation.



for marketable timber for immediate survival needs, constriction of forest resources available to villagers, and competition between different ethnic communities over a declining resource base are all illustrated clearly here.

#### 4.4 Adapting to resource shortages : relations between communities

As intimated above, the problems faced in the Luong Phong area are not limited to those whose homes were flooded by the reservoir. Increased pressure on the local resource base has led to tension and even conflict between communities as a result of the deteriorating resource situation.

An important point to note is the relative significance of material versus ethnic factors in inter-community tensions. Of the three villages Luong Phong, Mai and Ngu, tensions are probably greatest between Luong Phong and Mai, which are both Muong villages.<sup>25</sup> There have been instances of fights between Mai and Luong Phong villagers, and of Luong Phong livestock being shot. Ngu, a Dao village, has also faced increasing resource competition with both Luong Phong and Mai, but to a lesser extent. For the most part, the tension has been limited to isolated incidents of Luong Phong villagers' livestock wandering onto Ngu villagers' cropland. Part of the explanation appears to lie in a better defined boundary between Luong Phong and Ngu villages than between Luong Phong and Mai. Mai villagers complain that Luong Phong villagers encroach on their forests, depleting supplies of forest products such as bamboo and various forest foods, and also threatening the watershed area and hence Suoi Hoa irrigation system feeding the village's ricefields. Moreover, with the forests becoming more of an open access resource and associated loss of community control, Ngu villagers and even some from Mai are now reported to be exploiting the forests in an unsustainable manner. Mai farmers claim that their village used to be known for conservation of its forests, but more recently the forests surrounding Mai have been depleted rapidly. Households in Ngu reported selling between 30 - 60 m<sup>3</sup> of wood per annum to buyers in Tu Ly, which is now accessible by road.<sup>26</sup> Cinnamon, which is also collected for sale, is reported to be getting scarce.

Luong Phong villagers also face problems with communities elsewhere in Hien Luong, notably the villages of Mo and Chieng. They are allowed to use land in these villages, but are charged a "rent" by Mo villagers in the form of a share of the rice grown. Moreover, after a short period of time, often a single planting season, the land may be resumed and put under the PAM tree planting scheme for the benefit of local Mo villagers. Luong Phong farmers feel they are simply being used to clear the land, but have little choice in the absence of permanent rights elsewhere.

Thus resource competition between the communities can be seen in a number of areas:

- a) Land. The flat area of dryland adjacent to Luong Phong known as Bua Ngu (Figure 5) is used for grazing and rotational shifting cultivation by Mai farmers, who now complain that competition from Luong Phong newcomers is resulting in shorter fallow periods and declining yields. There is also competition between Luong Phong and Mo farmers for areas of dryland.

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<sup>25</sup> Some Muong villagers in Mai distinguish themselves from the newcomer "Ao Ta" Muong at Luong Phong, whose dialect is slightly different. This was raised in the context of conflict over resources. The latter point rather than ethnicity *per se* appears more important.

<sup>26</sup> This compares with estimated annual consumption of 1.3 m<sup>3</sup> per capita for subsistence needs. In fact, tensions between Mai and Ngu go back to the late 1960s, when Muong rice farmers in Mai accused Dao shifting cultivators in Ngu of threatening their irrigation supply by cutting forest in the upper-watershed area of Suoi Hoa; adjudication by a District judge helped to solve the problem at that stage, but it has been aggravated once again with the pressures created by resettlement at Luong Phong.

- b) Forests. Wood and other forest products are being extracted from forests considered to belong to Mai at unsustainable rates in a classic "tragedy of the commons" situation.<sup>27</sup> The forest directly adjacent to Luong Phong village belongs to Mai.
- c) Water. When Luong Phong villagers moved to the area, they came on the understanding that water would be available by construction of an irrigation scheme to make Bua Ngu into rice terraces, and indeed some levelling work has already been done by individual farmers who have been allocated small plots. However, irrigating Bua Ngu as originally envisaged would mean diverting water from the Suoi Hoa stream that feeds the existing terraces belonging to Mai, a potentially explosive issue given limited supplies of water. The limited water supply and high permeability of the limestone-based Bua Ngu soils makes it unlikely that the whole area could be converted to wet-rice terraces.<sup>28</sup>
- d) Fish. The major impediment to establishing reservoir fishing as an alternative or supplementary livelihood source for Luong Phong villagers is the lack of capital for nets and boats. Only about one-third of Luong Phong households have boats for fishing and transportation. Even those who do have equipment report poor yields, of the order of about 1 kg fish from a night's fishing. An equally serious problem for those who do have equipment is theft, thought to be by villagers in whose vicinity fishing is being carried out.

One of the major difficulties from the point of view of the new settlers is the feeling of Luong Phong villagers as "second class citizens" in the local resource context, in the sense of having to rely on neighbouring communities' goodwill for access to land, forest and water resources. Moreover, at the commune level Luong Phong has no representation on the Hien Luong Commune People's Committee, despite being the largest village in the commune. This is an administrative and resource allocation problem that has remained unaddressed by the wider resettlement program, which has tended to focus on the immediate requirements of physical removal of communities to new areas. In particular, failure to take account of the full range of livelihood patterns and resource needs has left Luong Phong both literally and figuratively "high and dry".

The issue at hand is not only one of inadequate resource provision, but also of ill-defined resource entitlement at the community level. Prior to resettlement, resource entitlements were relatively well defined within communities, and there is still considerable trust among households within communities.<sup>29</sup> This is in interesting contrast with more individualised resource ownership in market economies such as Thailand, and should in fact offer potential for adapting resource allocation in the Vietnamese case. Nevertheless, the implications of decollectivisation under the economic reform program will become more important with time, in particular Decree No. 10. In the local context, this will make land allocation within communities a sensitive issue, and it will also make the physical planning of future irrigation schemes

27 The "tragedy of the commons" (Hardin 1968) refers to a situation where an open-access resource is depleted as calculation of private benefits take precedence over the public costs borne from individuals' exploitation of the resource. In the Luong Phong case, the situation has arisen as a result of a breakdown in common property resource management rather than from an instance of excess pressure on a pre-existing open-access resource as envisaged by Hardin.

28 If water could be brought from the Lo Lao stream some 6 km away, it is possible that the whole of Bua Ngu could be irrigated, but this would be an expensive undertaking.

29 This is exemplified in the village of Mai by the leaving of rice overnight to be husked in water powered rice pounders along Suoi Hoa stream, without any apparent concern over pilfering, in contrast to the mistrust between villages, where accusations of stealing goods such as cassava are sometimes heard.

more problematic with the need to serve a large number of households equitably and not just consider optimum design for maximising community benefit.

At this point it is worthwhile to consider the extent to which the Luong Phong experience is representative of the experience of the many other communities affected by the Hoa Binh reservoir in Ha Son Binh and Son La provinces. There is always a problem of depth versus breadth in a study of this type, particularly where time is quite limited. One important question is whether impacts are shaped by ethnicity of the communities affected, given that a number of different ethnic minority groups were affected. The two periods of study in Hien Luong (see under Methodology, above) were complemented by a more extensive survey of villages elsewhere in Da Bac district and in Phu Yen district of Son La, including Thai communities that had been displaced. From reported experience in these areas, the Hien Luong case seems representative in some key areas:

- a) Effects of displacement are both direct and indirect. In other areas, encroachment on resources of existing communities had adversely affected those communities and often led to tensions between newcomers and inhabitants of the resettlement vicinity.
- b) Extreme impoverishment. In all cases, those who had resettled faced extreme hardship, food shortage, insufficient compensation, and greatly reduced levels of material well-being compared with their previous situation. In most cases, this was closely linked to the move from fertile wet-riceland to steep dryland.
- c) Unsustainability. As in Hien Luong, even the impoverished level of living faced by resettled communities appears unsustainable, given the current reliance on farming steep slopes likely to lead to soil erosion and declining yields. Forests are depleted along the length of the reservoir except in the most inaccessible steep gorges.
- d) The overlap of resource and ethnic interaction between resettled and existing communities found in Hien Luong was repeated elsewhere, for example in Phu Yen, where Thai and Muong communities are farming uplands that had been part of the range of Hmong shifting cultivators. Here too there is potential for more in-depth study of the relationship between social and material effects of resettlement.

## 5. IMPLICATIONS AND OUTSTANDING ISSUES

A number of Vietnamese commentators have pointed to the beneficial upstream social and environmental impacts of the reservoir. These include the establishment of a transportation route and associated markets along the water edge; a new microclimate whose increased humidity and its moderating influence on temperature extremes allows for new crops and perhaps extended growing periods; and the reservoir itself, notably as a fisheries resource. Nevertheless, these are to date at best potential rather than actual benefits, as the affected population have yet to take advantage of the new opportunities provided. This concluding section sets out some implications raised by the study for fuller diversion of benefits of the Hoa Binh scheme to the people and environments that have so far borne the brunt of the adverse impact.

### 5.1 Some implications for identifying social and environmental impacts

The study raises as many questions as it answers, but it does point to some important strategies for studying the social and environmental impacts of a large resource project

such as Hoa Binh. It is particularly important to avoid overly simplistic models of social and environmental impact, to understand the relationship between social and environmental impacts, and to look at both material and non-material aspects of disruption of people's livelihoods.

In assessing impact, it is important to distinguish between different types of communities. The complex ethnic makeup of northwestern Vietnam, and other areas in which resource development projects are likely to occur, suggests that careful examination of pre-existing resource use and management patterns associated with particular ethnic groups is important to understanding the requirements and constraints of resettlement programs and the adaptations required in new agro-ecological circumstances. In the case of dams, it is also important to distinguish between the needs and opportunities afforded to communities resettled close to and at some distance from the reservoir, at lower and higher altitudes, with greater or lesser access to land, forest and water resources.

It is also important to distinguish between the direct and indirect effects of resource development. The number of people directly affected by the Hoa Binh dam is estimated at 58,000, but the wider impact raises this figure considerably. Although it is difficult to quantify indirect impacts, they must be accounted for in any sensitive social and environmental impact assessment, particularly where such impacts derive partly or fully from competition and conflict over resources with those directly affected.

There is a need to account for the full range of local resource constraints imposed by large resource development projects. In the case of Hoa Binh, an important source of the problems faced by affected populations has been the failure to consider and implement resettlement provisions beyond basic housing and, in some cases, land requirements. In the latter case, insufficient attention to the fertility and irrigability of land in resettlement areas has been a cause of hardship. Fundamental to re-establishment of viable and sustainable livelihoods is an understanding of the full range of individual and community resource uses, past, present and future. Assessment should be at least threefold:

- a) Starting with pre-existing resource use, allocation and management strategies;
- b) Assessing the extent to which these can be substituted in resettlement areas
- c) Catering for the likely change in livelihood patterns necessitated by new agro-ecological circumstances faced by displaced populations.

The consequences of failure to consider the whole resource basis of local livelihoods are both social and environmental, as people are forced into predations on land and forest resources in an unsustainable manner.

Consideration of resource patterns in affected communities also needs to take into account proprietorship over resources among and between local populations and newcomers in areas where there is likely to be some level of competition over forest, water and land resources - and this probably includes most instances, at Hoa Binh in particular, and further afield in Vietnam. Moreover, in the context of rural Vietnam during the 1990s, it is necessary to consider the changing basis for individual and community resource management and use resulting from the economic reforms, notably decollectivisation and the increasing market orientation of production.

The following are some of the major implications of Vietnam's economic restructuring that require a reconsideration of the basis for compensation and resettlement planning:

- a) Overall, a rapid increase in demand for electrical energy, that will put strong pressure on the Ministry of Energy to develop new sources, including hydropower;
- b) A need to consider compensation packages based on market, not subsidised values;
- c) Restructuring of livelihoods oriented to household level production, allowing for flexibility of production decisions and hence a move away from blueprint approaches targeted at the collective level, with an overemphasis on infrastructure;
- d) Allowing for a wider range of livelihood options in new market conditions, to replace emphasis on subsistence crops (mainly rice) where the latter is not ecologically feasible; in the past, food crops were emphasised due to limited development of markets and to meet provincial targets of food self-sufficiency;
- e) Re-orientation of the bureaucratic role from direct management of production to provision of an adequate legal/regulatory framework for resettlement, including proper household and community demarcation of resource entitlements;
- f) Recognition of the need for new common property resource management structures, to avoid "throwing out the baby with the bathwater" in decollectivisation (eg irrigation channels, community forests).

Monitoring the implementation of these reforms in the case of communities affected by the Hoa Binh scheme will give indications of similar challenges to be faced by communities elsewhere whose resource base is diminished or altered by large scale resource projects in the energy, mining, forestry and other sectors.

## 5.2 Policy implications

There is little doubt that the adversity faced by those displaced by the Hoa Binh reservoir has been exacerbated considerably by the coincidence of the physical move with a move from a socialised to a market economy. This has meant that individual farmers have had to make a double adaptation, to a harsher physical environment and more constrained resource base, on the one hand, and toward an individualised economy in which some existing "safety nets" have been removed. It also means that parts of the compensation planning, devised as they were with the assumptions of subsidised food prices and centralised management, have been inadequate for households struggling to survive in a new physical and economic environment. An urgent policy imperative is to reconsider the basis of resettlement planning and compensation mechanisms in light of *doi moi*.

The single most generalisable lesson from the Hoa Binh experience is one that is also applicable to similar schemes in other countries, and that is the need for participation of affected people in the planning and provision for resettlement and reconstruction of livelihoods. Many of the mistakes made in the case of Hoa Binh stem from an over-centralised management structure that has failed in large part to take into account the realities of making a living in a very different agro-ecological setting to that which affected people had been used to. Some of the "compensation" programs, for example the decision to use compensation funds to supply sugar cane stock, have not only failed in an agro-economic sense, but also led to considerable resentment among local people.

Participation has become a catchword in development programs throughout Southeast Asia and further afield, but building effective means for participatory planning is a

complex and long term process that goes beyond the establishment of committees at different levels. Potentially, existing local structures such as People's Committees might go some way toward enhancing local involvement, but the limitations of existing structures needs to be recognised and further investigated. The fieldwork at Hien Luong raised at least two important issues regarding the role of commune People's Committees:

- a) There is a need for planning at the community level, as People's Committees not only represent a number of communities with often diverse interests, but as the case of Luong Phong shows, can serve to *exclude* newcomers from decision making and resource allocation.
- b) As communes lose their production role with decollectivisation, the role of the People's Committee will become more regulatory, and it is essential that in this context it become more participatory, backed up with legal and technical support from outside.

The potential role of the Women's Union needs to be investigated, particularly as so many of the immediate hardships fall disproportionately on the shoulders of women. The head of Luong Phong branch of the Women's Union gets only limited cooperation from the Hien Luong commune People's Committee, and is unable to do much on her own without external resources.

Fuller participation also requires involvement of local people from much earlier on in the negotiation and planning process than has been the case in Hoa Binh. Many of the measures taken by the resettlement authorities have been remedial, coping with immediate difficulties faced by displaced people rather than provision of long term livelihood options. With more sensitive and participatory planning that takes advantage of people's local knowledge and expertise and links it with technical support from outside extension agencies, there may be more scope for realistic and sustainable resettlement provision. Line ministries and departments providing technical support and extension advice need to tailor such input carefully to take account of local environmental conditions and community aspirations.

Participation needs to involve both those resettled and those indirectly affected. In the case of Hien Luong, early consultation and consideration of conflict resolution procedures among the villagers of Mai, Ngu, Luong Phong, Mo and other villages may have allowed for a number of resource conflicts and other areas of tension to be pre-empted or resolved, and also for a more realistic number of families to be resettled at Luong Phong.

The decentralisation of decision making that is part and parcel of increasing participatory planning may be enhanced by processes of micro-economic reform under *doi moi*. For example, farmers may enjoy greater flexibility of crop choice if provided with the opportunities and market knowledge, aiding adjustment to new physical conditions. However, this set of opportunities needs to be recognised by those used to more centralised bureaucratic management if their potential is to be realised.<sup>30</sup> Concretely, this means that a greater proportion of the limited funds available for resettlement needs to be released for direct administration by farmers and communities rather than by the bureaucratic authorities who continue to hold on to funds. In Luong Phong, the latest payment had been made in the form of sugar cane stalks as described above, and this accounted for only some 20 per cent of the total available. Villagers in Luong Phong would have liked the remaining funds to be released for purchase of fishing nets, seed and other productive goods at the household level.

<sup>30</sup> It must also be recognised that decollectivisation will create difficulties of its own, particularly in those areas where cooperative resource management and allocation is desirable for optimum efficiency, for example with new irrigation structures.

A further policy implication of the Hoa Binh experience is the difficult question of what financial resources can or should be made available to the communities who have borne the major costs. In a country whose exchequer is as constrained as that of Vietnam, it becomes very difficult at a later stage to divert resources to cater for social and environmental "externalities" of the scheme that were not accounted for in the planning stage. Yet experience at Hoa Binh and much more widely in the context of Southeast Asian resource projects and associated displacements is that there will *always* be unanticipated difficulties that emerge over time. Given the considerable surpluses generated as part of the resource project income - in the case of Hoa Binh, sale of electricity - the question of a continuing resource rent to be paid to displaced communities is one that needs to be considered by policy makers. The structures for administration of such funds at various levels are also crucial to improving participatory planning.

The geographical and administrative basis for resettlement planning for large scale projects such as Hoa Binh needs careful reassessment. In the Hoa Binh case, each district was expected to find areas of land for resettlement of people affected within its own boundaries. Although this may have advantages in providing at least a degree of decentralisation, in some cases it has been very difficult indeed for districts to find sufficient new land when a high proportion of the most productive land has been lost. A more realistic approach is to follow the suggestion of a Da Bac district official in Ty Ly, and to see the project as a national one that therefore requires national solutions (and the land and other resources that go with them) to the problems faced.

An important policy lesson to be learned from the Hoa Binh experience is the importance of not making unrealistic promises to those who are to be displaced. In most cases, the greatest resentment arises less from the hardships themselves than from the unfulfilled promises about a better life that the dam was supposed to bring people. In one village, the unrecompensed sacrifices for Hoa Binh were contrasted with the promises made by the Viet Minh in the 1950s in encouraging people to leave their homes and fields for the forests to deprive the French of food, ultimately a successful strategy that led in the long run to a great improvement in living standards. Apart from resentment of the authorities, another way in which unrealistic promises have exacerbated the problems is in encouraging too many people to move to some areas whose productive potential cannot support them. A more participatory planning process could only enhance realistic assessment of impacts on people's lives, since those affected would be involved in that assessment.

The immediate needs of those still suffering the effects of the flooding of their homes and fields have policy implications in at least three areas that require urgent attention. First is the need for capital in the form of revolving funds or low interest credit to establish new production enterprises, since most of those resettled have few resources of their own. Second is the need for training and extension, as well as provision of basic educational facilities in all communities to increase local people's potential for coping with the major adaptations required. Third is institutional provision for the transition from centrally planned to market economy so that local people have the technical and market information as well as the range of skills allowing them to adapt in a flexible manner to opportunities as they arise, or alternatively, to move away from production systems that are clearly becoming unsustainable.

As outlined above, the social and environmental impacts of the Hoa Binh experience have policy implications in terms of how better to cater for displaced populations. They also provide indications of the wide range of factors that need to be taken into account in decisions regarding future schemes.<sup>31</sup> Perhaps the most significant scheme

31 A start has been made with the pioneering (in the Vietnam context) environmental impact assessment carried out for the Tri An dam in 1986. Nevertheless, the brevity of the resulting EIS (10 pages)

to consider in this context is the Ta Bu, or Son La project that is already at the preliminary planning stage at the Ministry of Energy. The 150 m high Son La dam would be built at the tail end of the Hoa Binh reservoir, would generate approximately twice as much electricity as Hoa Binh and would flood an area inhabited by more than double the population displaced by the Hoa Binh reservoir (130,000 people).<sup>32</sup> Much of the remaining fertile wet-riceland in Son La and Lai Chau provinces would be inundated, and the majority of those affected come from Thai and other ethnic minority groups. Other large dam projects in the construction or planning stages include Song Be (150 MW), Yaly (700 MW) and Ham Thuan (400 MW). A major difference between these projects and Hoa Binh is that, with the cessation of Soviet aid, they need to be funded by international development banks or consortia, which would expose them to the increasingly stringent environmental impact assessment requirements being imposed. It is vital that the Hoa Binh experience be used to the full in assessing the likely social and environmental impacts of such a scheme.

### 5.3 Outstanding research questions

The research on which this report is based has been in many ways quite preliminary. A number of research questions remain, and more detailed action research combined with community development activities in affected communities is a high priority. Among the outstanding questions are the following:

- What are the opportunities and constraints for displaced populations to adapt to the new livelihood conditions resulting from both:
  - (a) resettlement in unfamiliar agro-ecological zones;
  - (b) changed rural social, economic and political structures that are part of the *doi moi* reform process?
- What are the relative social, cultural, ecological and economic merits of the various patterns of resettlement, including:
  - (a) Clearing of new forested areas
  - (b) Movement onto unoccupied land that is degraded forest
  - (c) Move into already populated areas
  - (d) Settlement close to original displaced settlements (i.e. close to the reservoir edge in Hoa Binh case)
  - (e) Dispersal of communities with individual cash assistance

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suggests that there is considerable scope for development of EIA for such projects. Foremost in developing EIA methodology in Vietnam is Professor Le Thac Can of the Resources and Environment Research Program in Hanoi.

<sup>32</sup> Because of the enormous social and environmental impact of a dam with FSL of 265 m, a lower version (215 m) is being considered as an alternative, which would reduce the power potential from 3,600 MW to 2,400 MW. An intermediate level of 240 m is also under consideration. Sale of surplus electricity to China is even being mooted. From the Ministry of Energy's point of view, the Son La dam would have the added advantages of reducing siltation of Hoa Binh and eliminating the need for drawdown in the downstream reservoir, adding some 40 per cent to the energy potential of the latter; this would have important ramifications for communities settled on the Hoa Binh reservoir edge who may be depending on drawdown agriculture.



- What adaptations or improvements in local administrative structures are required to provide for more participatory planning of resettlement and other processes of adjustment?
- How can technical expertise be combined with local people's knowledge to develop production methods appropriate to local conditions and resources?
- How can the social and environmental impacts of large resource projects such as Hoa Binh be better anticipated in advance? How can the people most affected by such impacts be incorporated into the assessment process?

None of these questions is easy to answer. Indeed none can be properly answered on the basis of existing knowledge or data available to policy makers. Yet these are vital questions for those concerned with equitable and sustainable resource management in Vietnam, vital to the well-being of the economy as a whole and of rural populations who make up a majority of the potential beneficiaries of national development.

## APPENDIX A

**1. Villages visited;**

- a) Lang Vai Nua, Da Bac district; Muong, Kinh; 57 hhs
- b) Lang Che, Da Bac district; Muong; 9 hhs
- c) Lang Chom, Da Bac district; Muong; 50 hhs
- d) Lang Ne, Da Bac district; Muong; 12 hhs
- e) Lang Mo, Da Bac district; Muong, Kinh; 25 hhs
- f) Lang Gioi, Da Bac district; Muong
- g) Xom Mai, Da Bac district; Muong; 30 hhs
- h) Xom Ngu, Da Bac district; Dao; 41 hhs
- i) Xom Luong Phong, Da Bac district; Muong; 63 hhs
- j) Xom Ke, Da Bac district; Muong, Kinh; 51 hhs
- k) Ban Pa, Phu Yen district; White Thai; 74 hhs
- l) Ban Hua Na, Phu Yen district; White Thai; 28 hhs
- m) Ban Co Pu, Phu Yen district; White Thai; 29 hhs
- n) Ban Mung, Phu Yen district; Muong
- o) Van Yen, Phu Yen district; Muong; 58 hhs

**2. Topics covered in semi-structured interviews***a) Interviews of village leaders in 15 villages*

## Village settlement history

- Length of settlement, origins of settlement in original community
- Movement between original settlement and other areas
- Post-revolutionary changes
- Effects of war on the area (French, American)
- Recent history of collectivisation, de-collectivisation

## Population and Ethnicity

- Number of households, people
- Ethnic composition
- Amalgamation, division of communities
- Structures of leadership
- Migration to and from community - past and present

## Livelihoods - before resettlement/flooding of reservoir

- figures on land under various crops
- sedentary and shifting cultivation - area and method; crop/field rotation patterns
- land/soil type and quality
- animal husbandry and livestock numbers
- subsistence/cash mix
- marketing structures - private/cooperative/local
- forest products
- employment outside agriculture

- major problems

#### Livelihoods - present

- figures on land under various crops
- sedentary and shifting cultivation - area and method; crop/field rotation patterns
- land/soil type and quality
- animal husbandry and livestock numbers
- subsistence/cash mix
- marketing structures - private/cooperative/local
- forest products
- employment outside agriculture
- forest cover in area before/since resettlement/flooding
- major problems
- change from past, including effect of reforms
- expectations for future livelihood opportunities / constraints

#### Resource tenure and management - past/present; individual/collective (official/traditional)/state

- land
- water
- forest
- other

#### Experience / expectations of resettlement

- timing and organisation of resettlement
- timing and process of consultation
- compensation details
- other forms of external assistance
- selection of new site
- suggestions for improvement of future resettlement schemes

#### *b) Change in livelihood patterns at the household level*

##### 1. Quantitative

###### a) resettlement [Luong Phong only]

- no. of years before moving informed about dam
- no. of times moved
- year moved here
- costs involved in moving
- household compensation promised/received

## b) population

- no. of family members
- age, sex of family members
- literacy/yrs schooling of each family member

## c) previous livelihood

- individual landholding - wet-rice / dryland
- cooperative landholding - wet-rice / dryland
- normal yields of each crop per year received by household
- number of months' rice availability in normal year
- normal cash income from various products [rice equivalent]
- livestock numbers [individual / cooperative]
- number of years' cultivation/fallow in rotational farming
- typical daily fish catches

## d) current livelihood

- individual landholding - wet-rice / dryland
- cooperative landholding - wet-rice / dryland
- land currently planted to various crops
- normal yields of each crop per year received by household
- number of months' rice availability in normal year
- normal cash income from various products [rice equivalent]
- livestock numbers [individual / cooperative]
- number of years' cultivation/fallow in rotational farming
- typical daily fish catches
- approximate cash income in 1990 [rice equivalent]

## 2. Qualitative

## a) resettlement

- relate household experience of resettlement :
- expectations, reality of new livelihood
- movement of grave sites

## b) population

- ethnicity (including type of Muong)
- relatives in neighbouring communities?

## c) previous livelihood

- range of crops grown
- rights over wet-rice land / dryland
- gender division of labour
- main forest products collected
- rights to collection of forest products
- type of fishing (pond / river)
- stability of livelihood, resources

d) current livelihood

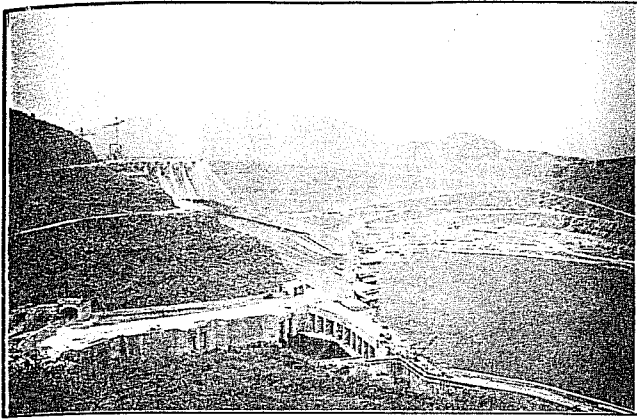
- range of crops grown
- rights over wet-rice land / dryland
- gender division of labour
- main forest products collected
- rights to collection of forest products
- type of fishing (pond / river / reservoir)
- stability of livelihood, resources

e) expectations of future livelihood

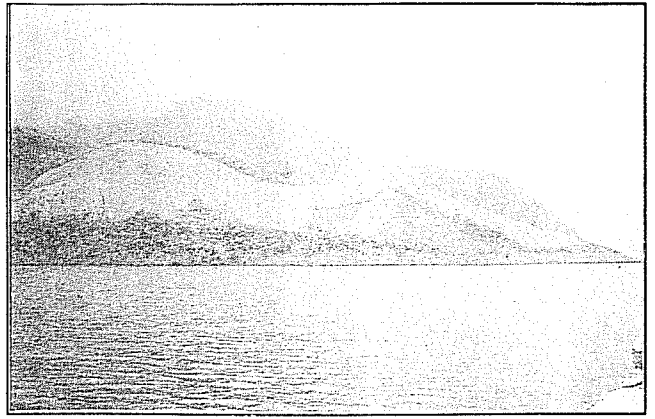
- trends in availability, fertility of wet-rice land
- trends in availability, fertility of dryland
- trends in availability of forest products
- trends in availability of fish
- trends in availability of water (domestic, irrigation)
- perceived reasons for above
- expectations, plans for livelihood changes

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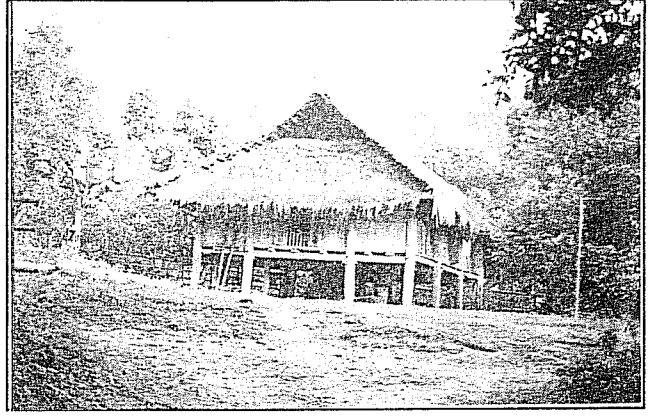
1. Hoa Binh Dam



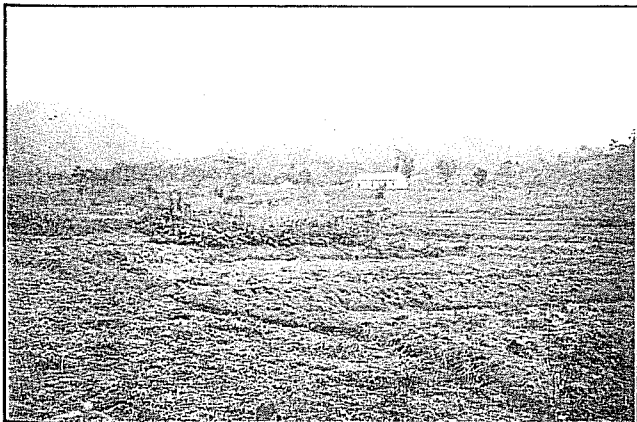
2. Even the steepest slopes at the reservoir edge have been cleared for cultivation.



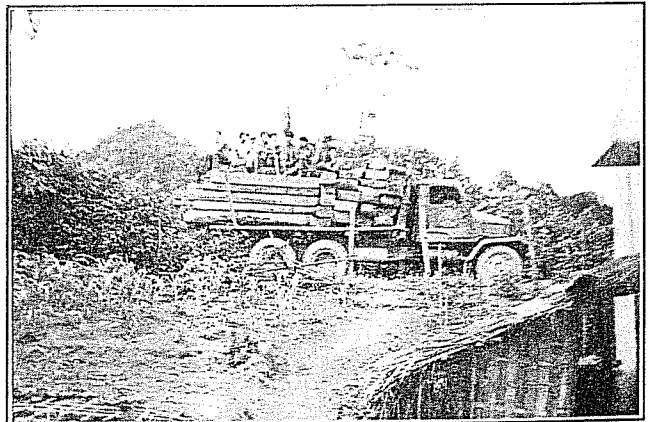
3. Muong houses at Luong Phong. The trees in the photo belong to Mai villagers.



4. A Muong house at Mai.



5. The Bua Ngu fields, looking from Luong Phong toward Ngu. The building in the background is the school and health station serving Luong Phong, Mai and Ngu.



6. The weekly collection of marketed timber from Ngu.