

**UPLAND  
PHILIPPINE COMMUNITIES:**

**GUARDIANS OF  
THE FINAL  
FOREST FRONTIERS**



## ***The Southeast Asia Sustainable Forest Management Network***

The objective of the Southeast Asia Sustainable Forest Management Network is to study degraded natural forests where community management may be a viable strategy in establishing access controls and thereby stabilizing forest use. The Network is comprised of a small, select coalition of Asian colleagues, many of whom have collaborated together for years, both with each other and with Network facilitators. The solidarity of the Network members is based on a common commitment and well-defined focus on exploring alternative management strategies for Asia's disturbed natural forest lands. The Network's strategy has been to move away from conventional, academic research toward more applied, interdisciplinary studies which have both practical and policy relevance. Through case diagnostic studies, the work attempts to capture the voices and needs of forest communities and to communicate their indigenous knowledge and perspectives on the human-forest relationship. To that end, the national teams in Thailand, Indonesia, and the Philippines are developing long-term working relationships with community members to learn more about their forest management issues, resource-use systems, and problem-solving strategies. The emphasis of the Network's research includes the ecology of natural regeneration, the economics of non-timber forest product systems, and the community organizations and institutional arrangements which support participatory management. The lessons stemming from the research aim to inform field implementation procedures, reorient training, and guide policy reform.

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*Front cover photo:* Last bastion of primary forest in the Dupinga watershed.

*Back cover photo:* A Bukid-non woman returning from swidden corn field, Upper Pulangi watershed.



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## **Southeast Asia Sustainable Forest Management Network**

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## **PREFACE**

This report provides a preliminary discussion of selected research findings from the Philippine members of the Southeast Asia Sustainable Forest Management Network. The Filipino team at the Environmental Research Division (ERD) of the Manila Observatory has been involved in diagnostic studies of the two research sites for several years. In the future, the ERD staff hopes to continue to work with these upland communities to assist them in stabilizing their natural resources and developing integrated watershed management plans. The Philippines team appreciates its continuing support from the Rockefeller and Ford Foundations. The team members would also like to acknowledge the cooperation they have received from the Department of Energy and Natural Resources. Finally, the authors would like to express their gratitude to the residents of Gabaldon, Malinao, St. Peter, Zamboangita, and Bendum for their hospitality and friendship. It is their dedication and commitment to protect their homelands against more powerful outside interests that has inspired the team to work with them and support their efforts at stabilizing the upper watersheds.

The Southeast Asia Sustainable Forest Management Network Secretariat, based at the Center for Southeast Asia Studies at the University of California, Berkeley, would also like to acknowledge its cast of supporters and contributors. We are most grateful to John O'Toole at the Rockefeller Foundation for his continued interest in the subject of community forest management and his commitment to support Network activities over the past two years. We would like to specifically thank Molly Kux and Toby Pierce of USAID for their intellectual guidance to the Network, as well as Janis Alcorn, Stephen Kelleher, and Richard Richina of the USAID-supported World Wildlife Fund's Biodiversity Support Program, for providing ideas and financial assistance for the production and publication of this study. At the University of California, Berkeley, we owe thanks for the excellent work of cartographer Jane Sturzinger, artist Anne Higgins, editors Bojana Ristich and Stephen Pitcher, and the competent administrators in the grants office. The facilitators of the Network are indebted to Robert Reed, Eric Crystal, and Cynthia Josayma at the Center for Southeast Asia Studies for their consistent cooperation and overall institutional support. Finally, the

Secretariat would like to extend its heartfelt thanks to all the member scientists of the Southeast Asia Network, whom we greatly value as friends and colleagues, for their hospitality during our field visits and for their commitment to this important research.

## **EXECUTIVE SUMMARY**

Documentation of deforestation and its impacts upon two of the Philippines' largest and most strategic watersheds, the Dupinga of Central Luzon and the Pulangi of Mindanao, provides lessons for the future management of the nation's remaining forests. These watersheds support some of the country's last primary rainforests, while also serving major agricultural and population centers in the lowland plains. Poorly regulated logging by multinational corporations and Filipino elites have rapidly denuded upland environments between the 1950s and 1980s, and a debilitating economic crisis in the lowlands has forced a steady stream of poor migrants into the uplands to seek their subsistence from a dwindling natural resource base. Indigenous tribal communities, overwhelmed by this onslaught, have typically fled deeper into the upper reaches of the forests in a struggle to hold on to their traditional land-use practices and ways of life. The Dupinga and the Upper Pulangi watersheds truly represent the final forest frontiers in the Philippines, and their ecological survival is critically important for tribal communities, upland migrants, and downstream rural and urban dwellers alike.

Concerned and disadvantaged upland communities have already taken action in an attempt to halt logging and control downstream flooding problems. They have barricaded logging roads and confronted armed gangs hired by timber companies in an attempt to stop the destruction of their forest environment. The challenge facing the community is to resolve conflicts among different resource user groups and to reach a consensus regarding management objectives, operating rules and regulations, and the institutional structure through which access controls and use rights will be implemented. Strong community leadership, combined with facilitation from neutral third parties based in nongovernmental organizations (NGOs), is already helping to join together tribal communities with migrant settlers to negotiate common goals and develop sustainable management strategies. However, the government will need to demonstrate strong political will in supporting community initiatives to stabilize valuable watersheds. This will require the unequivocal termination of remaining mining and logging leases, even if held by the rich and powerful. While the Philippines has

drafted some of the most progressive community-oriented resource management policies in Asia, they will have little impact on the larger issues of upland resource degradation unless the government can move quickly and decisively to channel its policies to empower poor tribal and upland migrant groups. The following case study research documents the severity of the problems, while also giving notice that local communities are already experimenting with strategies to respond to them. These communities undoubtedly hold the key to the solution of access controls and participatory management. Yet they desperately need strong, supportive leadership and action from a government committed to enabling their role as guardians of the forest.

## NATIONAL OVERVIEW

The Philippines has possessed some of the world's biologically richest tropical forests. The mountainous geography of the 7,100-island archipelago has historically supported a diverse array of flora and fauna, originating from three major biogeographic regions (i.e., Formosa, Celebes, and Borneo) and characterized by high degrees of endemism.<sup>1</sup> The nation's six major tropical forest types—mangrove, molave (*Vitex parviflora*), mixed dipterocarp, tropical montane, pine, and mossy—have been host to an estimated 12,000 native plants, 165 species of mammals, and 570 bird species.<sup>2</sup> As recently as 1900, these forest ecosystems covered 70–80 percent of the country.<sup>3</sup> Most of this forest has been situated in the “uplands,” defined today as equal to or greater than 18 percent slope.

Over the past half century, as the country steadily increased its annual timber production and expanding human populations converted forests to agricultural lands, forest cover has drastically declined (see Figure 1). This trend is especially striking for the primary forests. Timber production soared during the post-World War II period, peaking in 1975 and falling off sharply once stricter controls were established in the late 1980s. During the past few decades, many of the Philippines' forest ecosystems have experienced extensive degradation due to overexploitation by logging, burning, and agricultural clearing. Land satellite data spatially depict the compelling disappearance of forests throughout the Philippine archipelago between 1966 and 1987 (see Figure 2). By 1987, less than 22 percent of the country's land area supported forest vegetation, while undisturbed old growth forest represented less than 3 percent. Of this remnant primary growth, much is mossy forest above 600 meters in elevation, characterized by few dipterocarps or other species of commercial value (see Figure 3).

The loss of forest cover on the upper slopes of the nation's critical watersheds has created numerous systemic problems, for both upland and lowland communities. Deforestation has undermined the livelihoods of upland communities by accelerating erosion on upper agricultural lands and reducing forest product flows. At the same time, the clearing of forests has exacerbated downstream flooding and sedimentation, resulting in the loss of fertile croplands and creating erratic

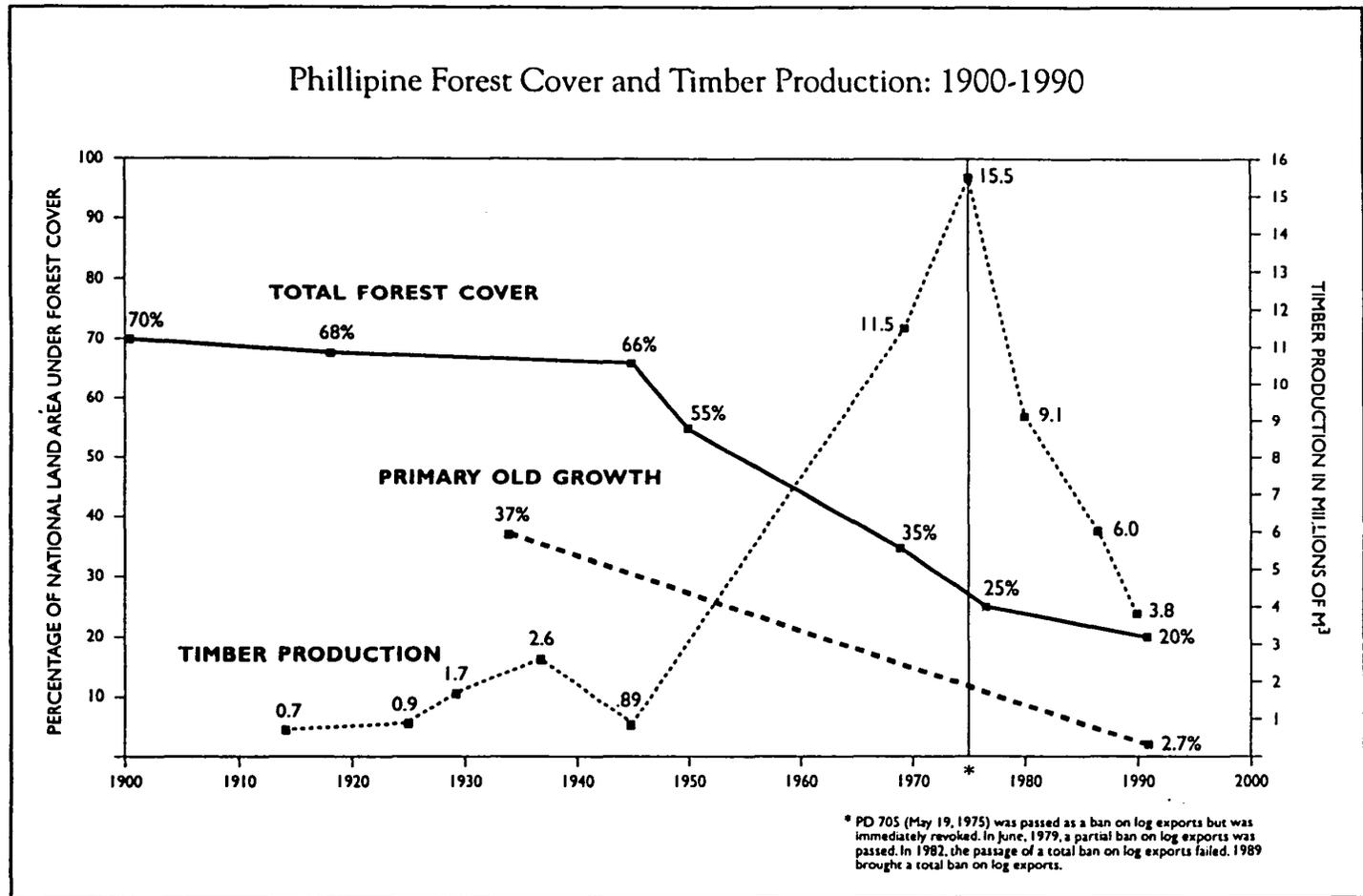


Figure 1

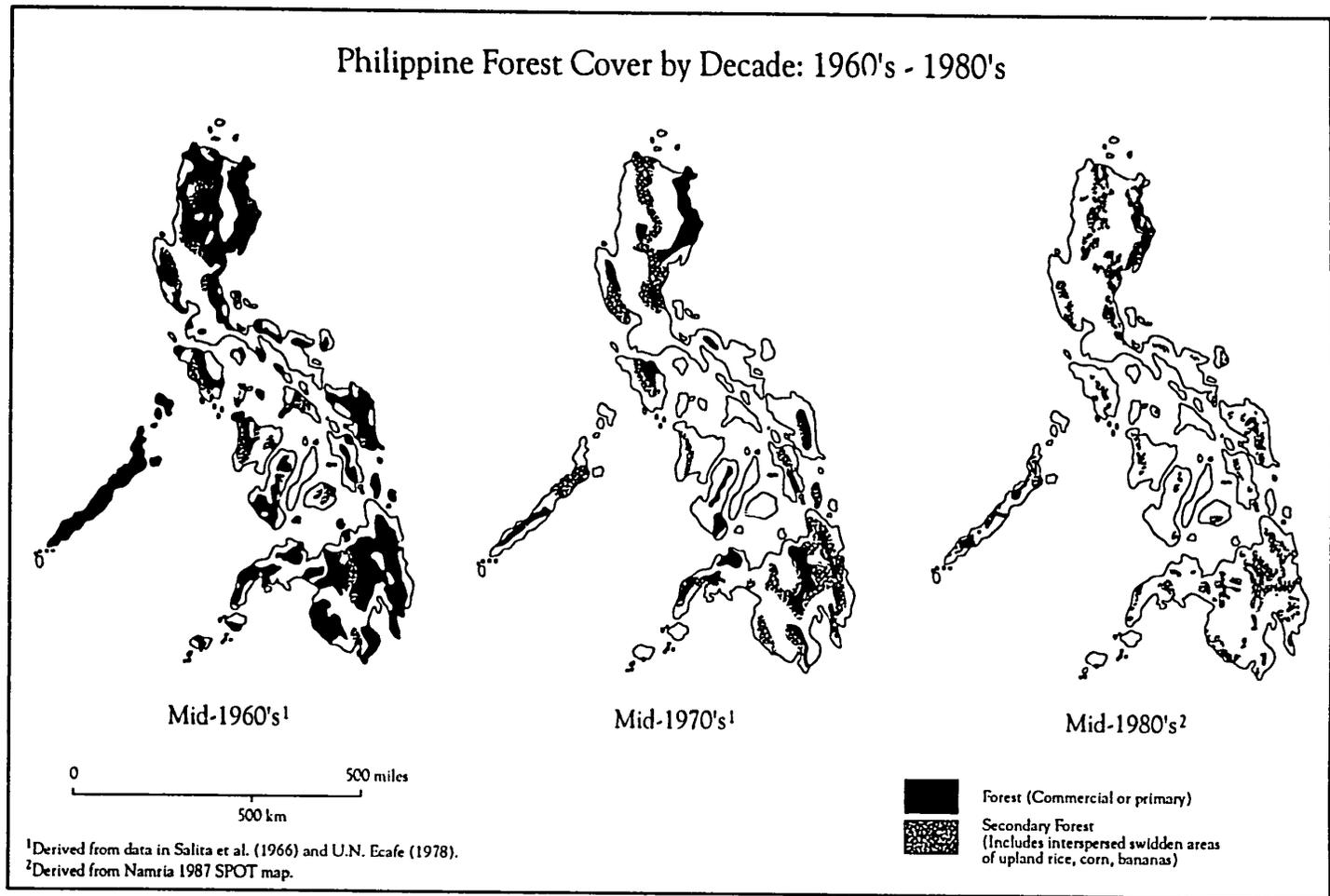
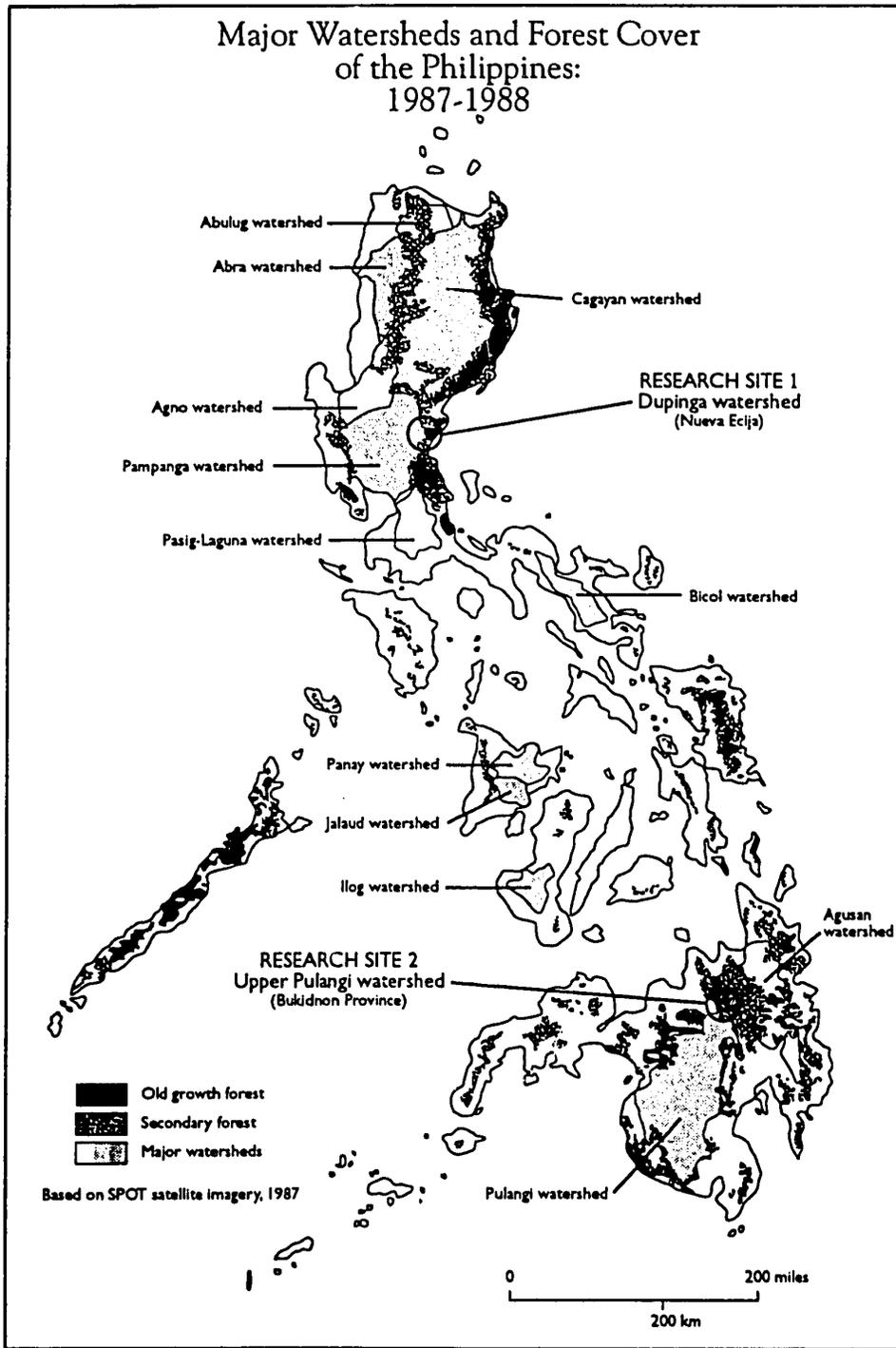


Figure 2

Figure 3



Best Available Document

water supplies and power shortages in the lowlands which affect both rural and metropolitan areas. The problems of upland degradation have also been linked to social marginalization and political instability.<sup>4</sup> An exhaustive study of the history of deforestation in the Philippines suggests that rights to forest resources have been captured by loggers and their allies. The combination of elite control and corruption has facilitated the granting of primary resources to a small group of concessionaires. This has led to the widening of income disparities and the undermining of use regulations, encouraging upland migration of the poor to release pressure from impoverished lowland areas where socioeconomic reforms were not taking place.<sup>5</sup> Upland peoples, stigmatized as "slash and burn" farmers and encroachers of public lands, have been marginalized in the process. Responding by continuous retreat, tribal communities have been the most adversely affected. At the same time, both disempowered tribal and migrant upland communities have been attractive target audiences for manipulation by communist, Islamic, and other separatist groups, placing local forest communities in even greater conflict with the state.

## FOREST POLICY HISTORY

In 1565, when Spanish conquerors first arrived in the Philippines, it was estimated that 90 percent of the archipelago was forested. The population of less than one million lived primarily along the coasts and in river valleys.<sup>6</sup> The Spanish colonial government encouraged active trade and agricultural expansion from the mid-eighteenth century onward. During the 1800s, the central plain forests of Luzon were systematically cleared. As a result of the Spanish land law, Filipino customary systems of land tenure were weakened and superseded, often resulting in periodic resistance from local communities. As forest lands were converted to agriculture and community resistance was suppressed, the colonial government as well as Filipino elites would claim tenure for themselves, stripping the land of any communal associations or traditional rights held by indigenous peoples.<sup>7</sup>

The Spanish established the first Bureau of Forestry in 1863 to oversee forest lands, all of which were legally claimed as public domain. A primary task of the new bureau was to ensure that only those forest lands suitable for agriculture were released to private interests. Certain historians believe that the bureau's policies accelerated privatization and forest clearance, noting that by 1870 the island of Cebu had already become severely deforested and eroded due to the expansion of sugar cane, rice, and corn cultivation and the rise of the timber industry.<sup>8</sup>

The concept of "modern" logging began in the Philippines in 1904, when the American Insular Lumber Company was granted a 30,000-hectare, 20-year renewable concession in northern Negros. Employing the latest steam locomotive and milling technology from the U.S. Pacific Northwest, the company began producing 30 cubic meters of dip-terocarp lumber per hour, introducing timber to the world market under the misnomer "Philippine mahogany." Shortly thereafter, a number of other American timber companies launched operations in the Philippines.

In an attempt to initiate a sustainable logging regime, some operations limited felling to trees over 40 centimeters in diameter. However, research sponsored in 1914 by the Bureau of Forest Management on Mt. Makiling (south of Manila) concluded that these limits did little to

ensure reproduction and therefore the regeneration and sustained existence of the forest. A 1914 study found that most of the wood volume was stored in the larger, dominant trees of dipterocarp forests. When these older giants were felled, "the saplings and smaller dipterocarps, which had grown up under the protection of the thick canopy, quickly died as the result of insolation [overheating] while the number of seedlings was reduced disastrously, by a factor of eight." Subsequently, "inferior" species inherited the site after the dipterocarp forest had been "completely and permanently destroyed."<sup>9</sup> The researchers found that the expansive dipterocarp canopy was "so integral a part of the forest that its removal endangers the very existence of the forest."<sup>10</sup>

More recent ecological research indicates that the domination of "inferior" species may be only an early phase in the natural process of secondary forest succession. In many cases, however, extensive and ongoing ecological disturbances caused by improper logging techniques followed by migrant farming and fires result in logged-over secondary forests which are suppressed, held in abeyance at the pioneer phase of regeneration. In contrast, more carefully regulated cutting and extraction practices and protection from further disturbances such as fires and soil overexploitation can promote rapid regrowth through the phases of secondary succession and reestablish a healthy forest cover. Unfortunately, this has rarely been the case in the Philippines. Timber industry assessments reveal that proper selective logging has been utilized in less than 10 of the nearly 500 logging concessions, including Timber License Agreements (TLA) and short-term special permits issued by President Ferdinand Marcos during the peak of the logging period.<sup>11</sup> Migrant populations who often follow logging roads into the area further increase pressures on the already disturbed ecosystem. By 1985, the indigenous upland population of 5.3 million had absorbed an additional 12.2 million migrants, 6.5 million of whom had settled on official forest lands. In addition, this upland migration phenomenon, which tends to follow logging, allows the timber industry to use migrant encroachment as a convenient excuse for avoiding its reforestation responsibilities. Then, once migrant farmers have expended hard labor to complete the clearing of logged-over lands for cultivation, the concessionaire can apply for permits to acquire the now "denuded" land for commercial plantations.<sup>12</sup>

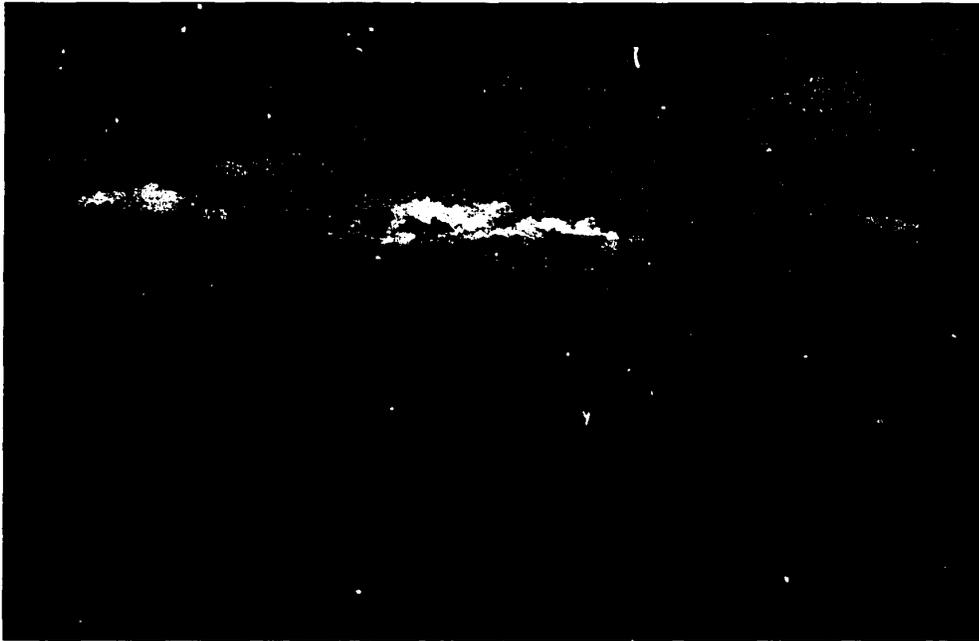
The Philippines experienced a phenomenal expansion of timber extraction from the end of World War II to the mid-1970s,<sup>13</sup> from under one million cubic meters to over 15 million cubic meters annual cut in

1975 (see Figure 1).<sup>14</sup> Between 1952 and 1977, the country lost 61 percent of its forests. Destruction was estimated to exceed reforestation efforts on an order of nine to one.<sup>15</sup> As a consequence, the United Nations Food and Agriculture Organization (FAO) predicted that the Philippines would exhaust its commercially exploitable primary forest by 1990—a projection that appears to be nearly realized.<sup>16</sup>

State concern over deforestation resulted in a brief logging ban in 1975, but little attempt was made to implement the policy, which was revoked three months later due to political pressures. Although estimates vary regarding the total volume legally and illegally extracted, during the peak of the logging boom in the mid-1970s the 230 TLA concessions operated with a national annual allowable cut of 15.5 million cubic meters. Even in the face of the rapid disappearance of the country's natural forests, timber production continued through the 1980s, stimulated by growing national and international markets and supportive government policies.<sup>17</sup> Yet due to dwindling supplies, the 10–15 million cubic meter production of the 1970s dropped by 50 to 60 percent in the 1980s. By 1989, production had declined to 4.5 million cubic meters, and the government imposed a ban on timber exports to ensure that local needs were met. In 1993 only 33 TLAs remained, with allowable cuts drastically reduced to under one million cubic meters annually. Nonetheless, in order to protect the local timber industry, the government maintains its policies in support of logging. These include import duties of 10 percent on whole logs and up to 50 percent on plywood and the retention of artificially low forest extraction fees for concessionaires. Attractive profit margins realized by loggers and exporters continue to encourage exploitation of the last stands of old growth dipterocarp forest.<sup>18</sup>

While logging operations were fueling the deforestation process through the 1960s and 1970s, government policies tended to blame indigenous communities and migrants and tried to control their *kaingin* (shifting cultivation) practices. Branded with the label *kaingeros*, these farmers enjoyed few if any land rights, especially if they belonged to indigenous cultural communities which have resided in the uplands for generations. Although the 1974 Forest Occupancy Management Program was introduced in an attempt to recognize upland communities, it never reached the vast majority.

Changes began in 1979, when a system of contractual agreements for families (i.e., Family Approach to Reforestation, or FAR) and communities (i.e., Communal Tree Farming, or CTF) was established to



Densely forested fifty years ago, the Gabaldon Valley has been primarily converted to agriculture; Santor watershed (in distance) and Dupinga watershed (foreground) have both been logged and cultivated, resulting in frequent flooding in the plains below.



A young Dumagat girl prepares fish and rice along the Dupinga River, while her parents collect rattan in the surrounding upland forests.



The opening of swidden fields pushes further into the Dupinga watershed as forest cover recedes.



Burned stumps are the only evidence of the dense forests that once covered the foothills of the Dupinga watershed; the resulting barren soils are vulnerable to erosion.

offer greater usufruct security to those engaged in upland tree planting programs.<sup>19</sup> Throughout the 1980s, the policy perspectives on upland communities shifted favorably. Rather than viewing uplanders as illegal encroachers as had been done in the 1960s and 1970s, upland programs were designed to better respond to issues of poverty and tenurial insecurity. But policies and programs to regularize the tenurial status of upland families met with political resistance and were implemented slowly. Community claims to upland forests, particularly those of indigenous tribal peoples, were thwarted as the power and influence of elites within the society remained predominant and commercial logging continued unabated.

An interagency working group was established in 1981 to help develop a more integrated strategy for effective uplands management. The group attempted to support the new government programs that emphasized community participation in planning and implementation. In 1982, the government established a new division to initiate the Integrated Social Forestry Program, which promoted community-oriented upland initiatives and provided twenty-five-year stewardship certificates for both community groups and families.<sup>20</sup> The program allowed upland communities to select individual household land stewardships or community-based tenure agreements and to respond to problems of access control to public forest lands by employing different agroforestry principles. Unfortunately, because most participants preferred individual agreements for their family farm plots, this minimized opportunities to bring larger tracts of critical upper watershed forests under local community management. As a result, the Department of Environment and Natural Resources (DENR) has issued only twenty-one leases of 500-1,000 hectares to qualifying upland resident community groups since the program's inception. With little experience in the operational processes of reaching joint management agreements with local communities, agencies working in the uplands have limited practical knowledge or skills regarding appropriate strategies for delineating ancestral lands and empowering community user groups.

In the early 1990s, President Corazon Aquino included community forest management as a component of the new constitution (Article II, Section 23) in an effort to provide greater recognition of the rights of indigenous communities to upland forest utilization. Administrative Order No. 2, issued in 1992, describes procedures for DENR task forces to demarcate ancestral land claims, yet funds for implementing the

policy have never been allocated. Whereas community forest management policies and programs in the Philippines are among the most enlightened in Asia, their field implementation has been thwarted and painfully slow.

## **MASTER PLAN FOR FORESTRY DEVELOPMENT**

In response to the nation's escalating forest resource crisis, community forest management has been the major emphasis under the 1990 Master Plan for Forestry Development (MPFD). Among other measures, the MPFD places restrictions on logging, forbidding harvest of remaining old growth and all high-elevation secondary forests, and limiting extraction to selected secondary forests and plantations slated for production. To ensure more equitable access to forest lands, the plan specifies the following measures: 1) reduction in number of TLAs; 2) replacement of remaining TLAs with corporate-community Timber Production Sharing Agreements (TPSAs); 3) pilot programs for community-based forest management; and 4) transfer of forest areas through leases to local communities.

Although supportive policies are intact and the DENR appears politically committed to the empowerment of communities as forest managers, a host of implementation problems have prevented any significant application of the MPFD. For one, the plan requires the identification of protection forests, including mapping and boundary-marking supported by legal registration. The definition and role of relevant community groups in this process and the mechanisms to facilitate their participation remain poorly defined. Given the immense scale of the task, with up to 18 million people residing in upland areas (which cover some 56 percent of the nation's land area), such operational barriers demand priority attention by DENR.<sup>21</sup> Furthermore, the current devolution of national government funds and the processes and implications of decentralized planning and governance are still unclear at the local level. No proposed mechanism exists to ensure that local government will effectively plan and enforce environmental programs and accountability. There is also concern that local government may place priority on funding fast-track economic development projects such as the construction of infrastructure and other facilities and may have considerable difficulty in its early years establishing long-term, community-based resource management programs.

It is also unclear how the transfer of former TLAs to TPSAs will benefit communities when the proposed partnership, dominated by business and corporate interests, may prompt the reopening of logged-

over areas, further fragmenting efforts to promote natural forest regeneration. To date, 85 percent of the original TLA concessions have been cancelled, predominantly due to expiration of contracts and exhaustion of forests. The shift to co-management through community partnerships with timber entrepreneurs not only raises questions of equity, but also emphasizes management systems based on further exploitation of natural resources which are already severely depleted.

The primary thrust of national forestry programs developed in the 1980s has been reforestation. While seedling survival rates have been less than 30 percent, plantations are expected to provide a sustainable supply of timber and pulp to meet future market demand. Yet experiences from other countries indicate that plantations often fail to relieve pressures on natural forests. In fact, they can further add pressure as natural forests are targeted for clearing and conversion to plantations. At the same time, plantations provide an attractive investment option for development and commercial banks. For the period between 1988 and 1995, under such programs as Industrial Tree Plantations (ITP), which utilized lands formerly under natural forests, the Asia Development Bank (ADB) has extended two loans totaling \$220 million for plantation development. Based in part on consultation and pressures from NGOs, the ADB now includes community participation as an integral component of plantation reforestation. However, any significant government or donor agency investments in community-based watershed protection and natural forest regeneration are still lacking. This oversight seems closely linked with the larger failure of national government programs and policies to protect the nation's remaining forests.



Roberta, a mestizo-Dumagat grandmother, has hunted and gathered rattan in the Dupinga since childhood.



Ridge above Lingod creek, logged and later opened for swidden farming; landslides result from geological mass wasting.



Natural forest regeneration in deforested Dupinga watershed foothills is suppressed by periodic fires which perpetuate green *cogon* grasses.



Dumagat man completes a two-day inner-tube trip transporting rattan harvest down the Dupinga River.



Dumagat woman cuts and skins rattan cane into poles in preparation for sale to local agents.

## DUPINGA: CRITICAL WATERSHEDS IN JEOPARDY

The Dupinga watershed is located in the Sierra Madre Mountains and harbors some of the best natural forest left in the Philippines (Figure 4). Located in the typhoon belt on the edge of the Pacific Ocean, these forests have been relatively protected from logging in past decades due to the violent storms that periodically lash the coast. The forest includes high-elevation mossy, as well as primary old growth and residual dipterocarp, which play multiple soil, water, and biodiversity conservation roles. The watershed spans the provincial boundaries of Aurora and Nueva Ecija. Flowing west, the Dupinga River joins the Coronel in the larger Pampanga River basin and irrigates the rich ricelands of the Central Luzon Plain. Based on its strategic location, the Pampanga has always been one of the most crucial watersheds in the country, providing water supplies to metropolitan Manila and supporting Luzon's richest primary rainforest (see Figure 5).

### *In-Migration History*

A review of the broader experience of the Central Luzon Plain, into which the Pampanga River drains, elucidates the problems of forest management in the Sierra Madre, and more specifically in the Dupinga watershed and neighboring communities of Gabaldon. During the nineteenth century, much of the Central Plain was converted from forest and swamp to emerge as one of the Philippines' most important rice-producing areas. Ilocano people, with a tendency to migrate, had moved into the Central Plain by the early 1800s. A century later, they were advancing into the eastern province of Nueva Ecija.<sup>22</sup> In the early decades of the 1900s, the processes of in-migration, forest clearing, and agricultural commercialization accelerated, reaching the Coronel River valley around World War II as roads were constructed to facilitate timber extraction. This led to the progressive displacement of the Dumagats, the indigenous cultural group who had historically occupied the Sierra Madre in settlements scattered along the eastern coast and river banks.<sup>23</sup>

The clearing of forests in the Luzon Plain resulted in the disappearance of small streams, lakes, and marshlands and eliminated the oppor-

Figure 4

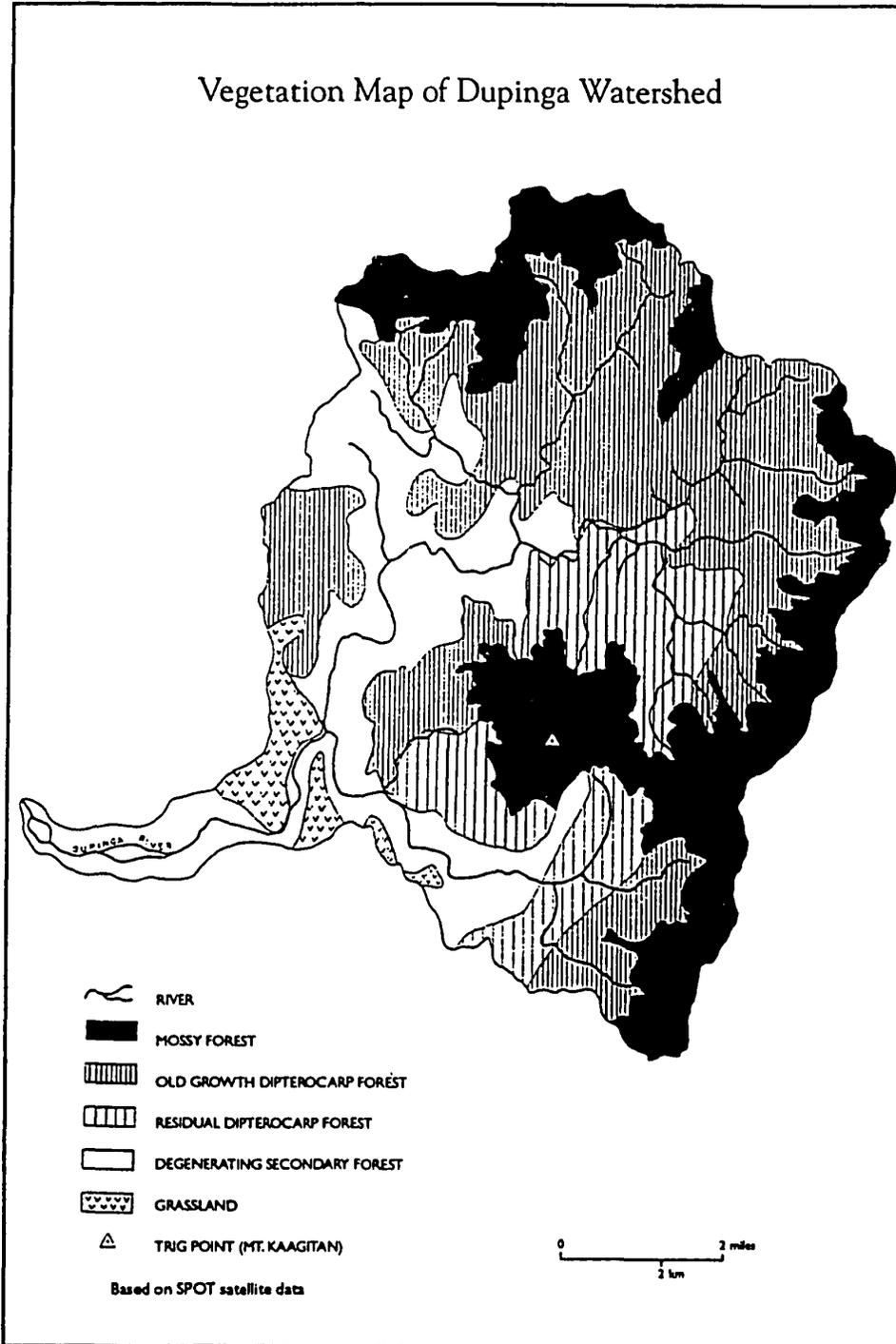
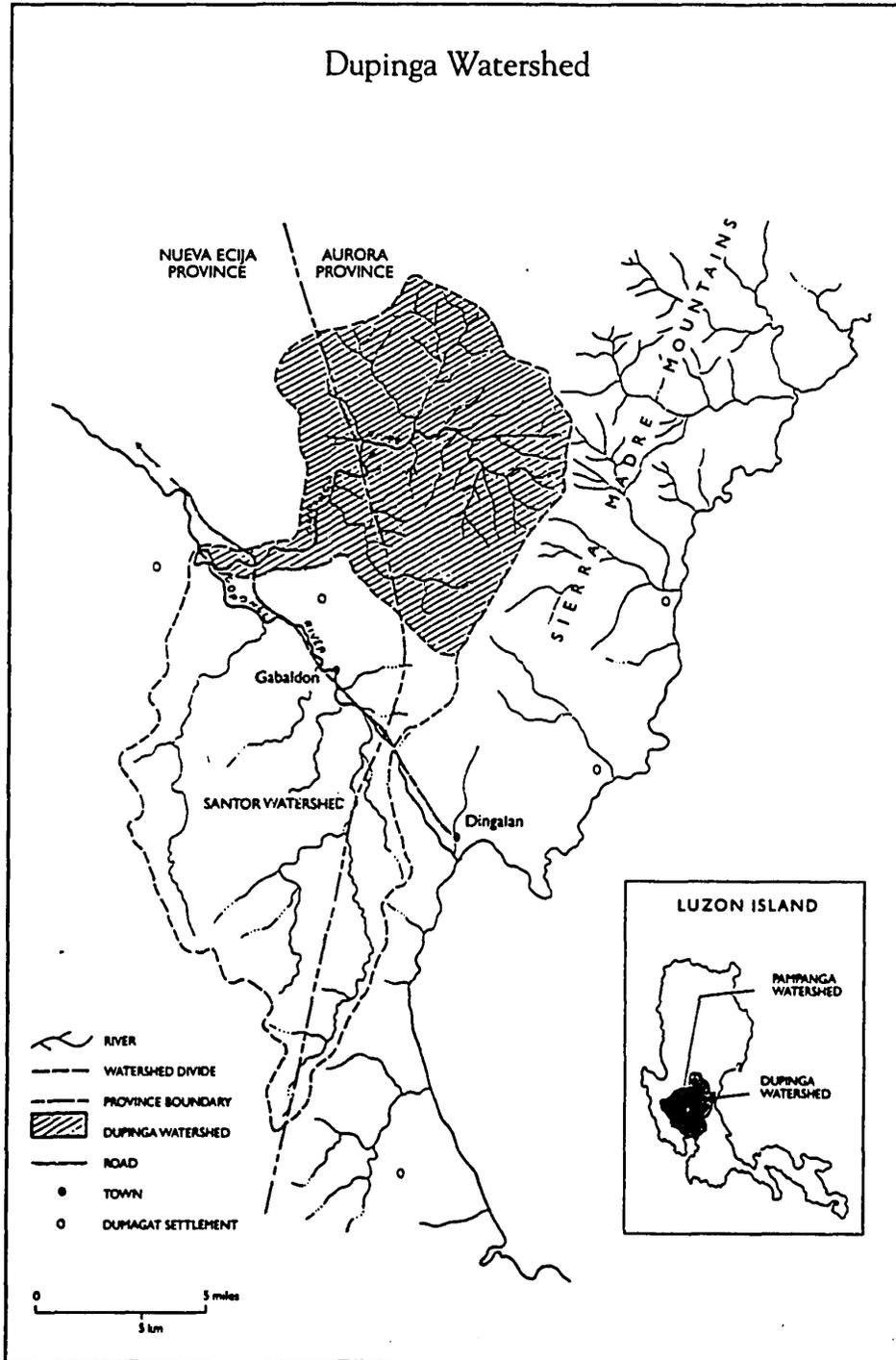


Figure 5



tunity to cultivate crops in the dry season.<sup>24</sup> The gradual desiccation of the lowland environment was further compounded by the expansion of logging and *kaingin* in the watersheds of the central Cordillera and Sierra Madre. Upland forest clearing disrupted hydrological flows and undermined natural water conservation mechanisms. The valleys became increasingly vulnerable to erosion, river and reservoir sedimentation, and more pronounced flooding and drought cycles.<sup>25</sup> Today the stabilization of the Sierra Madre watersheds has become not only imperative for forest communities in Gabaldon, but also for the Luzon rice plain and metropolitan Manila. Dwindling supplies of hydroelectric power and water flows to Manila are creating escalating problems for the city's population of over 7 million. Remarkably, logging by elite concessionaires and the military on reserves still continues in the Sierra Madre's abused upland watersheds.

### *Changing Human Ecology*

Historical forest maps of the Dupinga watershed reveal the successive opening of forests, beginning with the Coronel River basin in the 1940s and gradually moving up the Dupinga River and its tributaries from the 1970s to the present (see Figure 6). As early as the late 1800s, small Dumagat settlements were already established along the Coronel and Dupinga Rivers. As Ilocano and Tagalog migrants moved into the area, they took control and converted the riverine lands to rice fields. Dumagats moved further up the river, pushed by the migrants, eventually concentrating near the confluence of the Coronel and Dupinga Rivers. From the original scattered pattern of well-spaced Dumagat settlements along the rivers, the movements of more politically empowered lowland migrants have resulted in major settlement shifts in a series of retreats by the acquiescent Dumagats. The Dumagats' response has been to increasingly consolidate their settlements into clusters and advance further and further upriver, away from the lowlanders. Concerted attempts to organize the Dumagats in the 1980s have led to the establishment of settlements such as the one located in the foothills of the watershed above the *barangay*, or township, of Malinao (see Figure 7).

The conversion of the Gabaldon valley landscape initiated the process of deforestation which has gradually progressed into the upper Dupinga watershed. Prior to World War II, most of the valley bottom was good forest or marshland, with scattered farms and settlements. Between 1942 and 1945, the Japanese occupation army constructed a

Figure 6

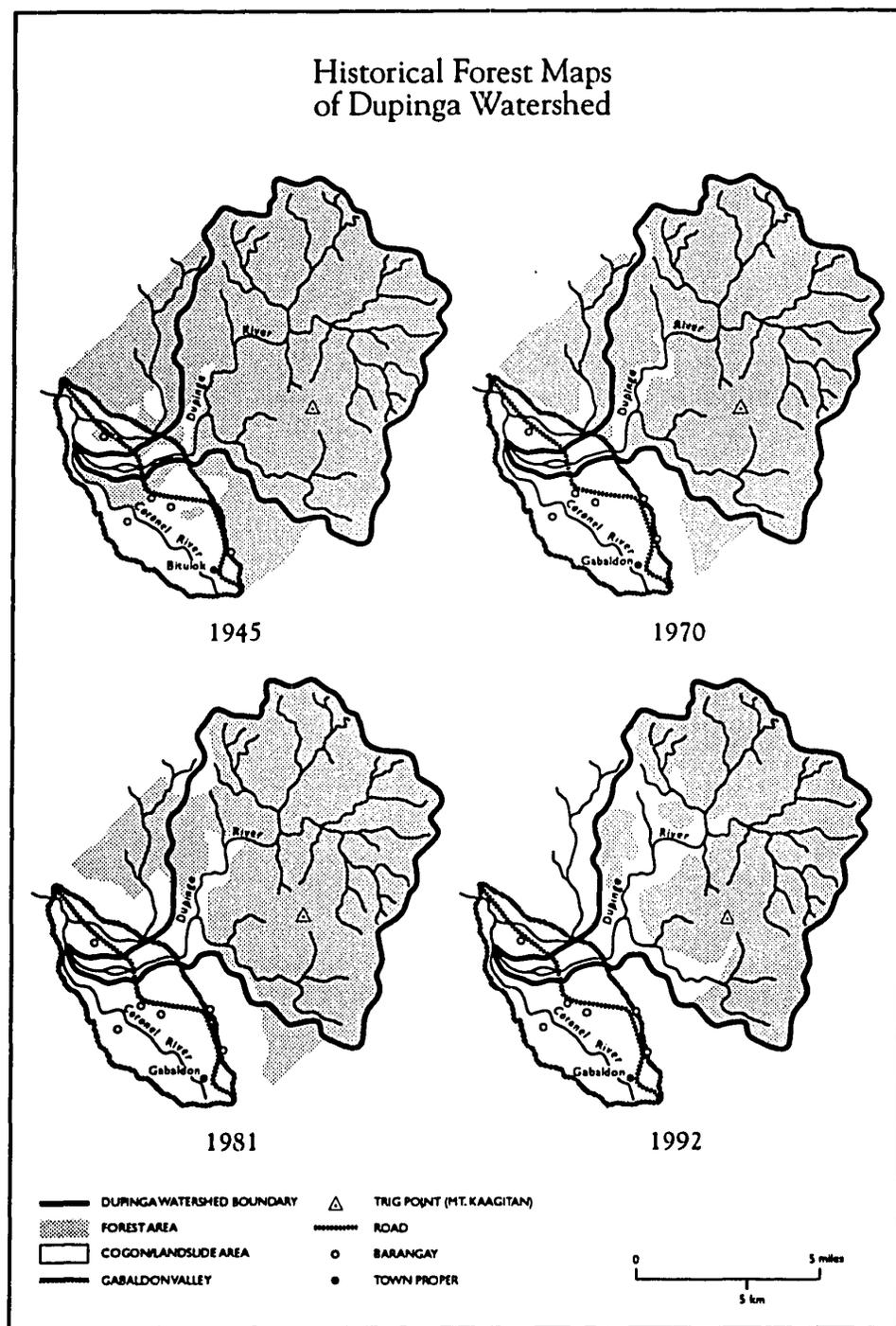
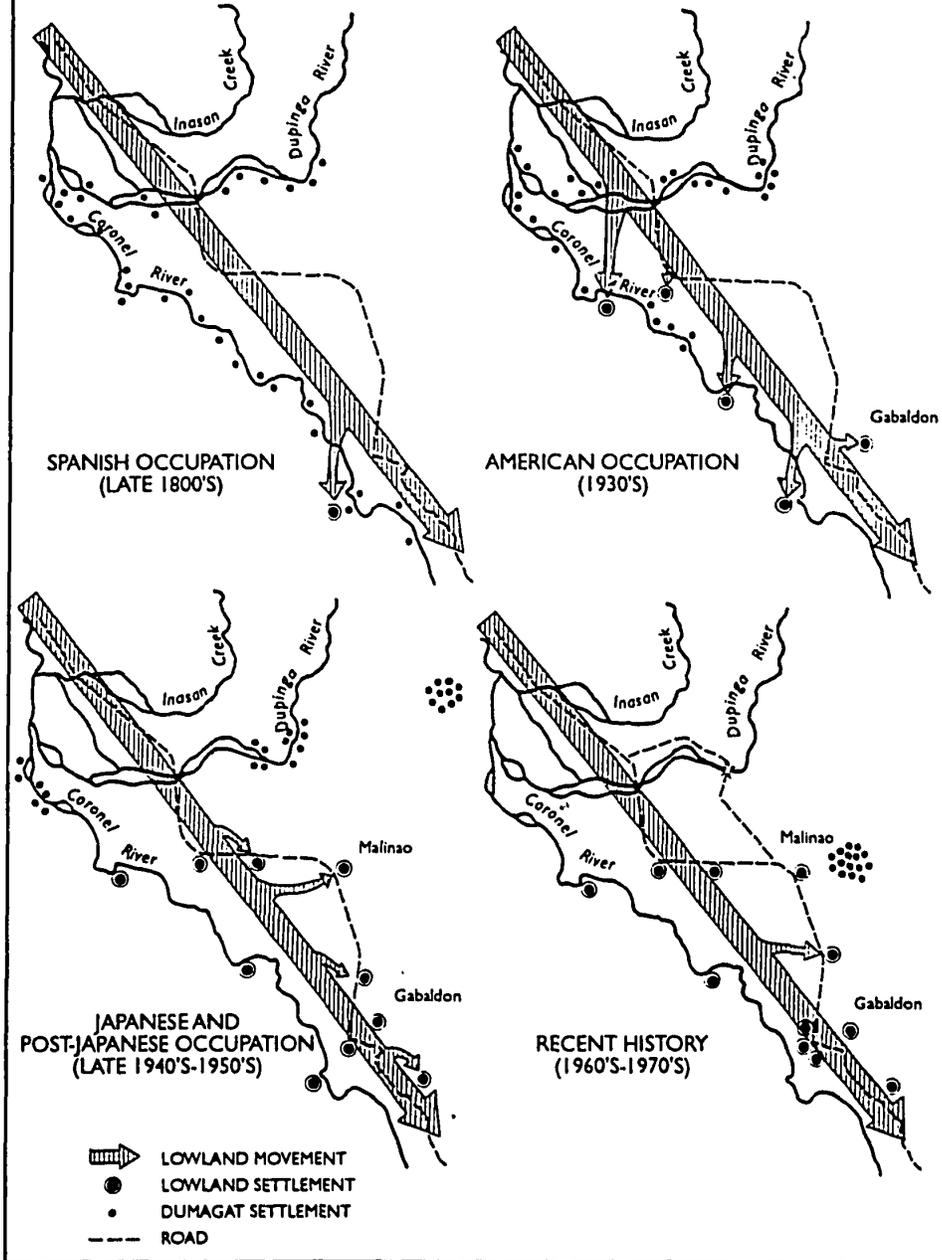


Figure 7

### Lowland Migrant Movements and Dumagat Retreat in the Dupinga Watershed

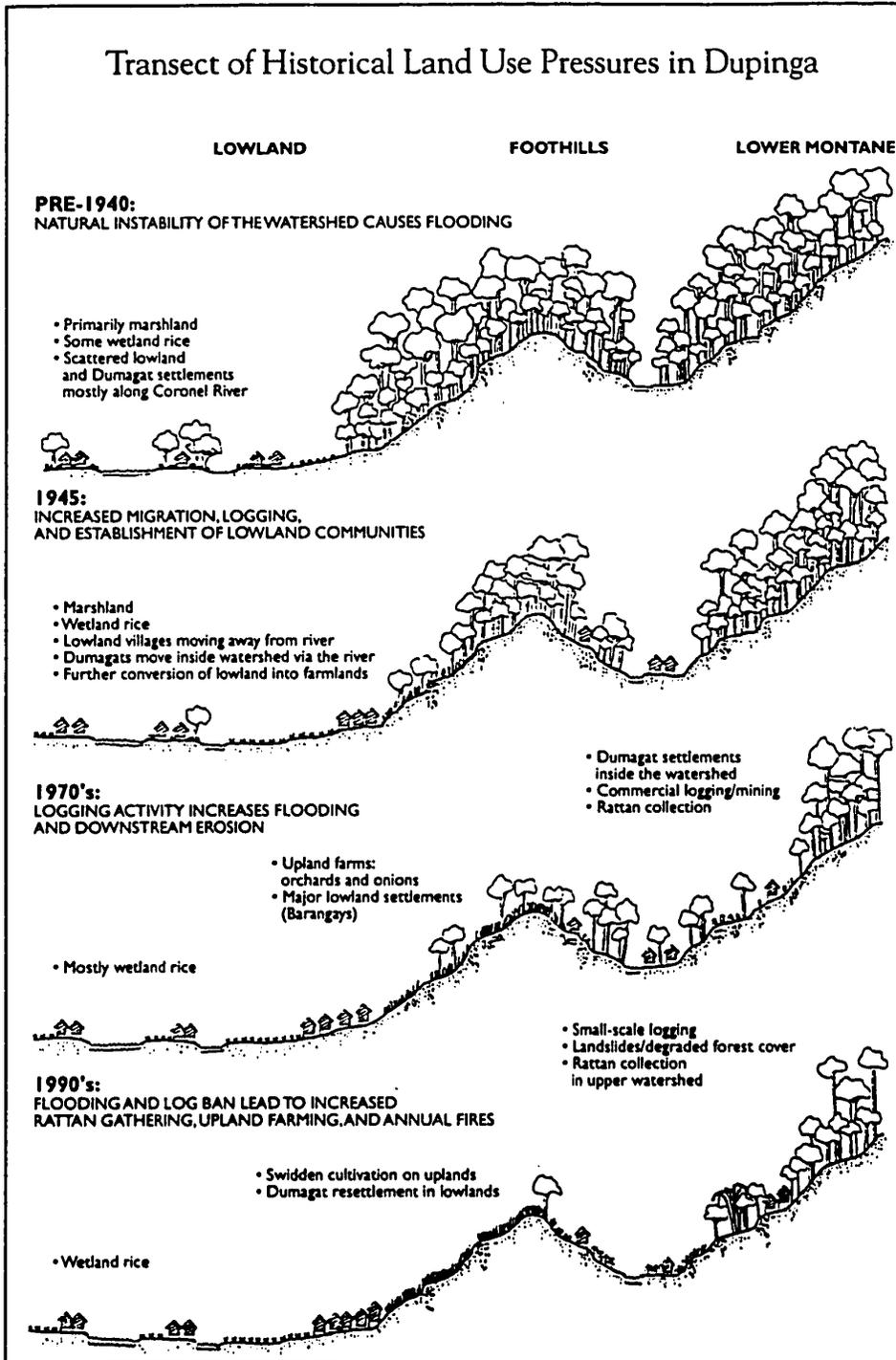


road from Dingalan on the Pacific coast to Gabaldon, facilitating logging and the transport of timber from the valley to the coast. The expansion of logging activities on the lower foothills of the watershed in the early 1960s opened the area to extended *kaingin*. By the 1970s, the peak of logging extraction in the area, a network of roads drove deep into the Dupinga watershed, increasing the frequency of landslides and sediment loading of the river. Land pressures and poverty in the valley forced a greater number of Dumagats and landless Tagalogs into the once forested upland watershed to cultivate their swidden plots (see Figure 8). These agricultural practices on steep slopes exacerbated erosion and increased the area subject to annual burning, in turn promoting the invasion of pioneering grasses such as *cogon* (*Imperata cylindrica*). As forest cover diminished, large areas of grass and landslides have gradually spread geographically outward from the river valleys. The primary factors fueling the transformation of the area's human ecology have been interactive: road-building into the interior and large-scale timber harvesting, lowland migrant flows, land-use pressures inducing steeper hillside swidden, illegal logging, commercialization and overharvesting of rattan, loss of agricultural lands, and natural events such as typhoons, floods, and earthquakes. Suffering the negative consequences of these cumulative processes, in the 1980s the communities of Gabaldon began organizing to protest logging and to discuss their own strategies to improve management of the watershed. A fifty-year time line of events highlights successive influences and responses to the changing human-ecological landscape of Dupinga (see Figure 9). The case description of a Dumagat grandmother who was born and raised in the watershed also illustrates a villager's perspective on the changing influences in the area and the local resource dependencies which remain strong today (see case study, p. 26).

#### **Natural Instability**

The steady degradation of the Dupinga watershed results from a combination of both natural and human-induced activities. Among natural influences, major tectonic plates and fault lines cut through the region, activating tremors which periodically result in mass movements and landslides. The entire Dupinga, and the Sierra Madre in general, are naturally unstable, in part due to these tremors that dislodge surface and subsoils. These processes are compounded by a very steep slope distribution. The western portion of the watershed shows massive landslips. Landslides are also found in the heavily forested

Figure 8



### Time Line of Events Affecting Land Use in Dupinga

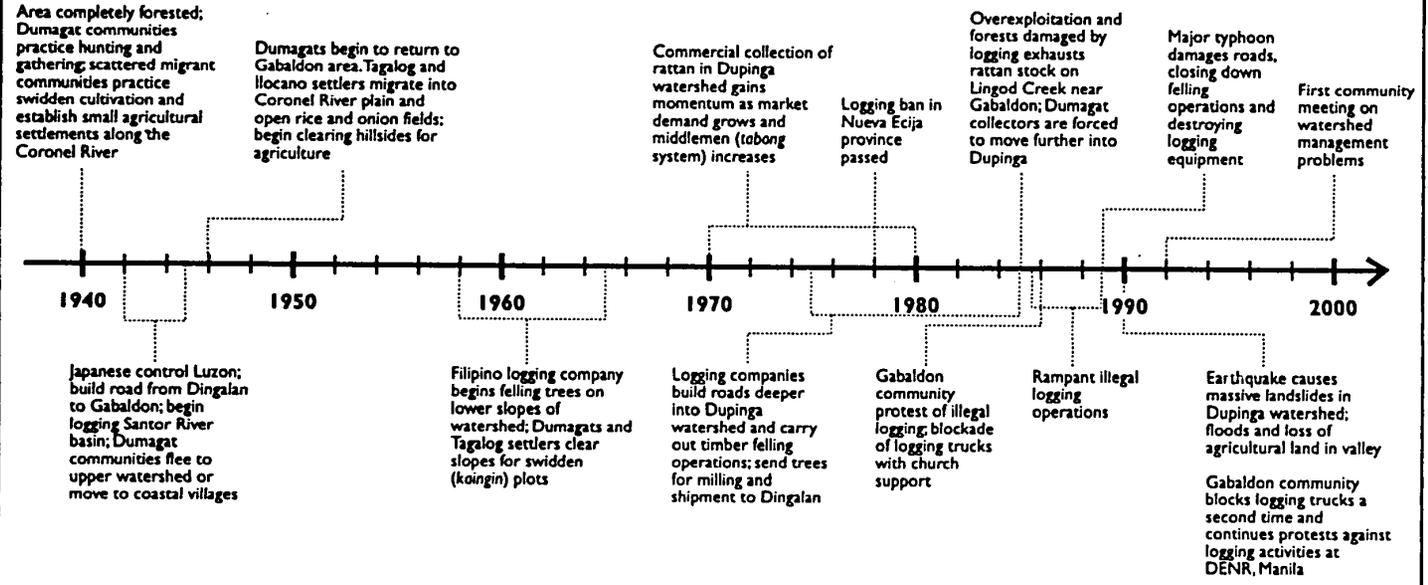


Figure 9



### Dumagat Elder: History of Forest Resource Dependency

Roberta, a 70-year old mestizo-Dumagat grandmother born in Lagyo on Dingalan Bay, resides in the village of Malinao, over the Sierra Madre Mountains at the foot of the Dupinga watershed. Her ancestors likely lived for centuries along the eastern coast of Luzon, moving into the forests to gather, hunt, and farm. Before World War II, Roberta's family migrated to the Dupinga area, where her father gathered rattan daily from the forest. After marrying a lowland Tagalog who was also a rattan-gatherer, Roberta herself began collecting rattan as a primary occupation.

While gathering rattan, Roberta also collected other non-timber foods—fruits such as *palawai*, *bolete*, and citrus *katmun*, and betel nuts. When she was younger, Roberta combined rattan extraction with hunting and fishing. She hunted deer and wild boar with a pack of ten dogs, a spear, and a bolo knife, often entering the forest alone with the dogs and killing up to four boar per week. With hand-made goggles and a notched spear, Roberta would dive for fish and eel which ran abundant in the Dupinga River. As a secondary occupation, her family practiced small-scale swidden farming, burning and planting upland patches with rice and string beans.

When the Japanese entered the region in 1941, Roberta's family moved back to Lagyo. They returned several years after the war, and Roberta remembers that Dupinga looked very different. The big trees were gone, and the upland forests had receded. "Everybody was now going to the forest for their livelihood," she recalls, including many more Tagalogs who had migrated to Dupinga and begun collecting rattan. While her perception of the forest's fate infers logging operations by the Japanese, Roberta also described *kaingin* by Dumagats and Tagalogs as a major source of forest destruction.

Roberta's family became increasingly dependent on rattan extraction as the better land was progressively claimed by the Tagalogs. Eventually, her family no longer practiced *kaingin*. She and her relatives worked as full-time rattan collectors, selling their unprocessed rattan to the middleman who controlled prices and markets. Rattan extraction regulations were overlooked by government field foresters, who were bribed to allow open access and free collection, even in sites that were clearly suffering overexploitation. Roberta and her family extracted the maximum quantities possible, limited only by their ability to walk far distances into the forest and haul and float the rattan downriver. Roberta recalls that the Dumagats were aware of the diminishing availability of rattan stock, yet their dependency on the trade left them no option but to continue to harvest aggressively.

Today Roberta notes significant changes in the environment around her village. She is convinced that the river has less water and seems weaker, except in the flood season, and that the fish are declining due to the introduction of car batteries to electrocute them. Roberta fears that given expanding demand for rattan, dwindling supplies, and current rates of extraction, the stock will be completely exhausted in a decade, when her grandchildren will be old enough to collect. She has been advising her children, who are collectors, to obtain title to a piece of land, believing that this strategy will provide a more stable economic future than depending on a declining forest resource base.



area of the watershed, another indication of Dupinga's natural instability.

The watershed also lies in the eastern Luzon typhoon belt, subjecting it to severe storms from the Pacific Ocean. During periods of high rainfall, rapid runoff stimulates landslides, especially in logged-over and other denuded areas. Heavy soil erosion results in the sedimentation of riverbeds, while the confluence of rapid runoff from different rivers and tributaries induces lowland flooding. As the watershed has experienced increasing deforestation, the narrow riverbeds have expanded into broad flood plains in recent decades (see Figure 10).

During the extended dry season, burning of *kaingin* patches frequently runs out of control, suppressing natural regeneration over large areas of degraded forest lands. Since natural geophysical forces can cause unstable geomorphological and hydrological conditions, any human disturbances are prone to magnify the degree of erosion, sedimentation, and flooding.

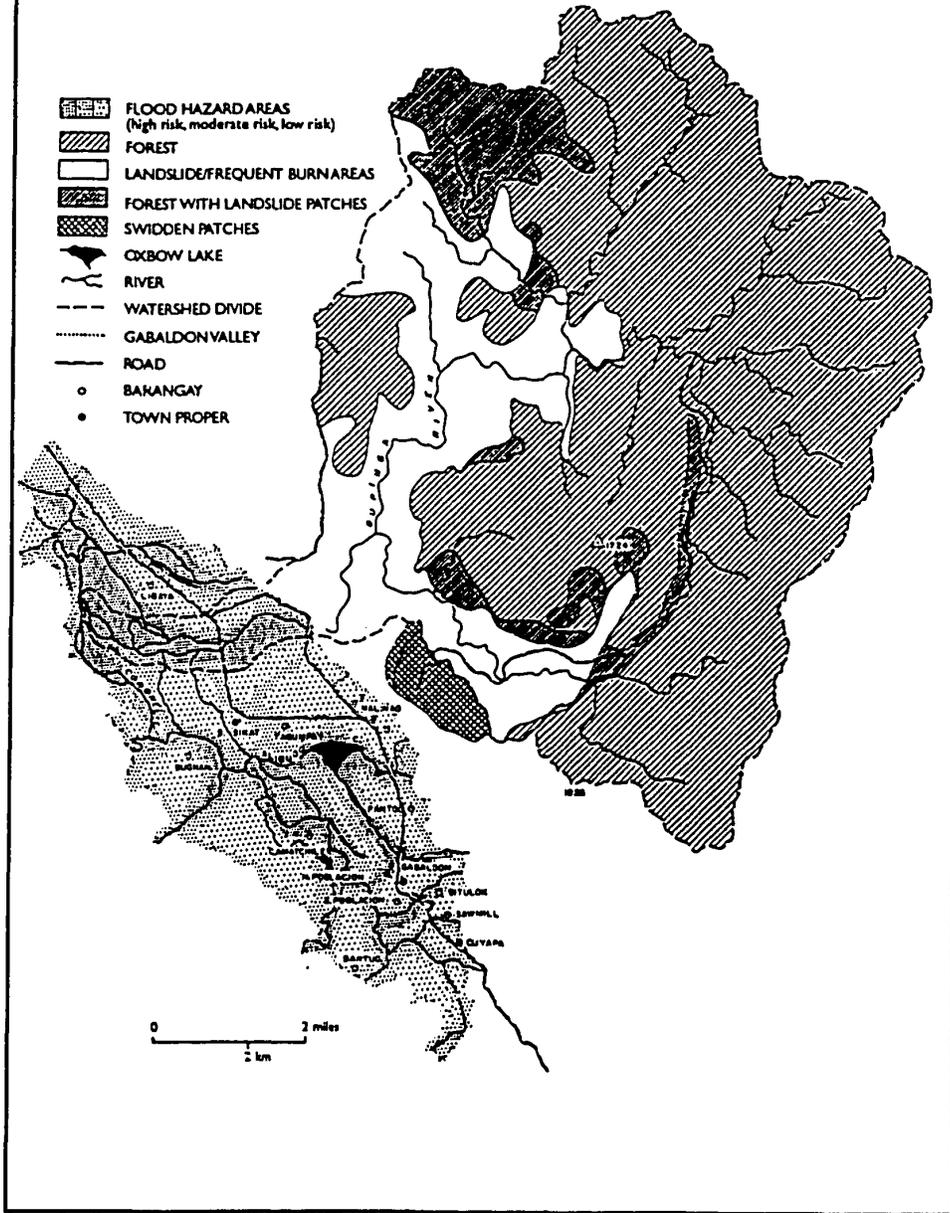
#### **Human Disturbance Patterns**

Human activities which contribute to the deterioration of the watershed are distinguished between those interventions from outside the area, usually with heavy capital investments (e.g., logging, mining, and road-building), and those resulting from activities of the local population (e.g., *kaingin*, small-scale harvesting). Despite the fragility of the Dupinga and its severe erosion potential and downstream flooding problems, the Inter-Pacific Forest Resources Company still controls logging rights to over one-half the watershed. Although not currently operating in the area, the concessionaire's prior road construction and extraction of giant dipterocarps have increased the instability of many slopes and damaged river banks when logs were floated out.

Taking advantage of the road network, local entrepreneurs have increased small-scale illegal logging operations in the last decade. In the late 1980s, it was estimated that eleven unlicensed saw mills were operating in the Gabaldon area. Predominantly small-to-medium logs (up to 30 cm. diameter) are hauled out by buffalo along the drag trails and roads. Compared to large-scale commercial operations, these activities have less negative impact on the forest since extracted volumes are small and cause less soil compaction and erosion. Nonetheless, because small-scale loggers operate at the margins of the forest, they contribute to the gradual recession of forest boundaries. The practices of burning the undergrowth in the dry season for easy access and dragging out cut

Figure 10

### Bio-Physical Influences on the Duponga Watershed and Gabaldon Valley



round logs are commonly visible at the periphery and strips of residual forest along the Dupinga River and its tributaries. Annual burning destroys many types of regenerating species, from small embedded seeds to young seedlings and saplings, and leads to soil nutrient depletion, elimination of soil microbes, and the collapse of soil structure. In turn, this leads to further susceptibility to erosion and landslides.

In addition to the small-scale logging, over the past twenty years a number of small-scale, open-pit mining and tunneling operations have been initiated in Dupinga. The activities have primarily involved the extraction of manganese ore in the Madulag and Agud areas (Mt. Calantas). The mining has resulted in massive soil erosion, particularly in the Madulag area, where stream measurements below the mine reflect substantially higher volumes of sedimentation than other streams in Dupinga.

The adverse impacts of logging and mining in Dupinga arise in part from the construction of roads that cut through the steep and highly sheared slopes. Using bulldozers and heavy earth-moving equipment, logging and mining operations have built a network of dirt tracts within Dupinga. Despite governmental guidelines, no reclamation has been done, nor has there been any effective monitoring or oversight of these operations. In recent years, although commercial logging operations have been suspended, small-scale timber extractors continue to use the routes in the dry season.

In addition to logging, mining, and road construction, dry season grass fires are a major force behind the transformation of vegetative cover in the Dupinga watershed. Fires are typically started by *kaingeros* to either clear a plot or burn older *cogon*, which promotes a new flush of even-aged grass that can be harvested for roofing. Many of the lower slopes of the watershed are burned consecutively each year, suppressing the regeneration of pioneering forest species. Since farmers do not tend to clear fire breaks around their plots, the fires escape upwind to larger grassy areas and neighboring forest. Both natural forests and state-sponsored efforts at reforestation along the foothills in Dupinga have suffered greatly due to fire.

While most of the burning currently occurs in the foothills of the watershed, where communities open plots for agriculture and thatch grass collection, fires also erupt in the interior of the watershed when rattan collectors clear small patches for taro cultivation or attempt to eliminate brush to improve access to forest products. As a consequence, fires are one of the most important forces in the degeneration of forest

lands and the suppression of their ability to naturally regenerate. The ecological outcome is a successional stage of fire disclimax, in which the vegetative community is dominated by *cogon* and biologically impoverished. Research trials with natural regeneration from Cebu indicate that even in very degraded sites, forest succession processes can progress rapidly if annual burning is controlled. A low cost and effective method being tested to reduce fire spread involves lodging down the *cogon* grass with a board. The pressed grass allows light to reach the young tree seedlings, and when fire does occur, slows the rate and intensity of the burn.<sup>26</sup>

#### ***Local Resource-Use Systems***

The communities residing at the foot of the Dupinga watershed are troubled about their future. Landed Ilocano and Tagalog farmers fear that their rice, cane fields, and property will be washed away by torrential floodwaters rushing off the deforested uplands. Dumagat and Tagalog swidden cultivators in the foothills are aware that the expansion of *cogon* grasslands and the erosion of topsoils from the steep slopes they cultivate threaten productivity and their existence. Finally, the families that still survive directly from hunting, fishing, and harvesting forest rattan are acutely aware of growing scarcities. Certain lowland communities have recently begun to organize for change. They have attempted to close logging roads in Gabaldon to prevent timber exports from the area. Local communities are also worried that legal TLA holders may try to reinstate logging operations. These community groups require the unequivocal support of the DENR to ensure that existing TLAs are permanently revoked.

Some of the farmers in the foothills of the Dupinga have begun planting mango and other fruit trees. This appears to be a carefully selected longer-term strategy to stabilize agricultural land use and realize higher profits (see case study, p. 31). Plantations of high-value fruit trees also provide strong incentives to control fire and closely manage and monitor the land.

An estimated 255 people in the towns and villages of the Gabaldon valley, including most Dumagats, are directly dependent upon rattan collection as a major portion of their income. While settled in a community on the edge of Malinao, much of the Dumagats' time is spent in camps or semi-permanent settlements deep in the Dupinga watershed. Arguably, it is these primary forest users who have the greatest incen-

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### Boyet's Experiment with Upland Agroforestry

Ten years ago, Boyet and his Tagalog family collected rattan from the hill forests above Malinao. As supplies diminished and the work became more arduous, Boyet shifted into tenant farming in the valley. Although landless, he preferred farming over rattan collection because it provided him with greater financial security. In 1989, the Department of Agrarian Reform (DAR) offered Boyet the opportunity to farm a degraded and unused upland ridge tract above Malinao. Although allegedly under DAR's jurisdiction, based on its slopes of over 18 percent, the land is also classified as public forest land, placing it under overlapping DENR authority. According to Boyet, the tenure arrangement with DAR is based on a "good faith" verbal agreement by which he will receive land title in the future—once the land is under his longer-term cultivation. Boyet feels grateful for the opportunity to farm his "own" land and believes that the productivity potential of the area is good, despite steep slopes and a twenty-five-year cyclical history of *cogon* burning.

With heavy inputs of labor, Boyet and his fellow workers have progressively plowed up patches of tenacious *cogon* to plant a combination of taro and fruit trees. With limited capital and no extension assistance, Boyet's land-use strategy has been based on a desire to cultivate high-value produce which can be channeled to the larger markets of Cabanatuan and Manila. In the lower fields, which he established first, Boyet has recently transplanted mango trees amid the taro. He chose mangos because the saplings were cheap and available in the valley and could offer potentially high economic returns. Boyet predicts that without the trees, heavy rains on the slopes will deplete soil nutrients to the point where taro cultivation will no longer be possible after three years. His hope is that by that time, the mangos will provide enough green manure and soil stability to enable extended taro cultivation and eventually to dominate the site as an orchard. Boyet no longer collects any forest products, devoting his time to his farm. He feels convinced that the partly forested ridge above his farm plot is crucial to protecting his fields from mass soil erosion and washouts.

◆

tive to ensure that the forest resources are regenerated, enriched, and managed sustainably.

Currently, all the rattan gathered in Dupinga is derived from natural sources. Discussions with gatherers indicate that the availability of rattan has dramatically declined in those areas of the watershed near the valley communities, and that collectors are now walking long distances to extreme corners of the Dupinga catchment. While migration of rattan collection groups has been occurring into the upper watershed since the 1940s, out-migration from strategic collection points has become a more recent phenomenon since the late 1960s (see Figure 11a). Population flows are correlated to the increasing exhaustion of forest rattan; today, due to tapped out supplies, seven out of a total twelve historical supply routes are no longer utilized by collectors (see Figure 11b). While cutting the rattan canes for sale, collectors frequently gather the edible shoots as well, thereby removing new regenerating stock. Collectors estimate that commercial stocking levels will be exhausted within the next three to ten years—unless harvesting and management practices change. This reduction and increasing scarcity of supplies also elicits tension between the Dumagat and Tagalog collectors. A number of collection sites are viewed as informally exclusive to particular groups, but incursions by others continue to create conflict.

Some Dumagat collectors have recently expressed an interest in culturing rattan in various parts of the watershed where the environment is suitably moist and cool. Lucio, a recognized Dumagat leader, suggests Bungahan as a possible site because the remnant primary forest has large canopy trees which still provide the shade that rattan prefers. He feels that both Kapihan and eventually Soloyan are also strategic spots where rattan could be enrichment planted. Dumagat collectors estimate that it would require up to ten years for fast-growing rattan to reach an optimal 3 centimeters in diameter, although many collectors are harvesting earlier, at 1.5–1.8 centimeters. Collectors would prefer to experiment with fast-growing species such as *palasan* (*Calamus merrillii* Becc.) and *alimuran* (*Calamus ornatus*, var. *Philippines* Becc.). They note, however, that for a system to be successful, all collectors would have to agree to protect these areas and a consensus would need to be reached on exploitation rights and harvesting schedules. Lucio believes that the best way to manage cultured rattan in the forest is to organize two or three smaller management groups, comprised of households of user groups who wish to cooperate in the venture. He feels that individual families alone could not be caretakers of forest plantings.

Figure 11a

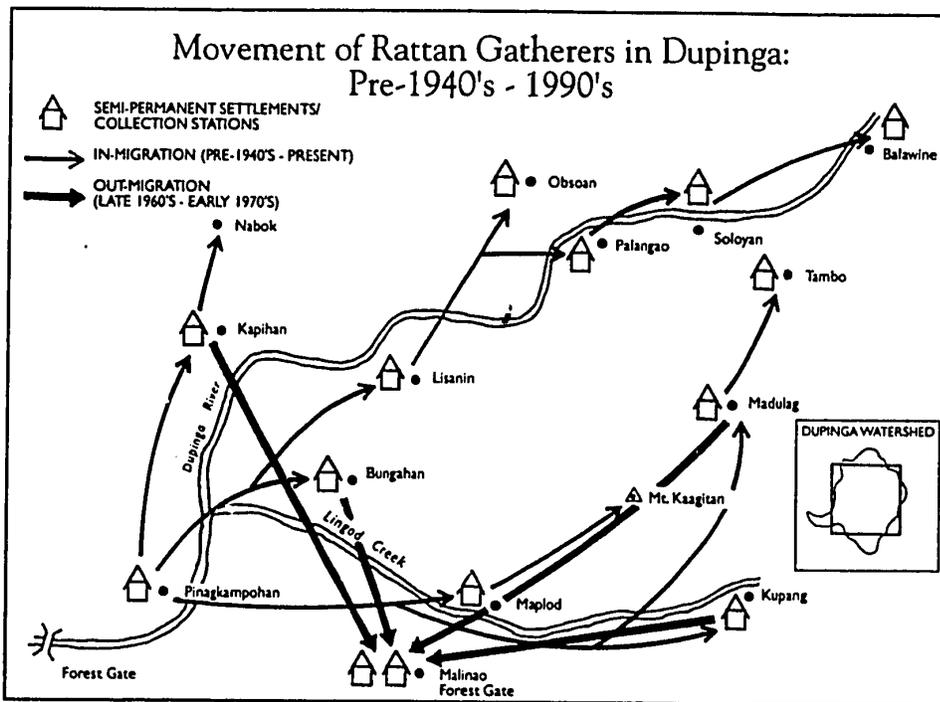
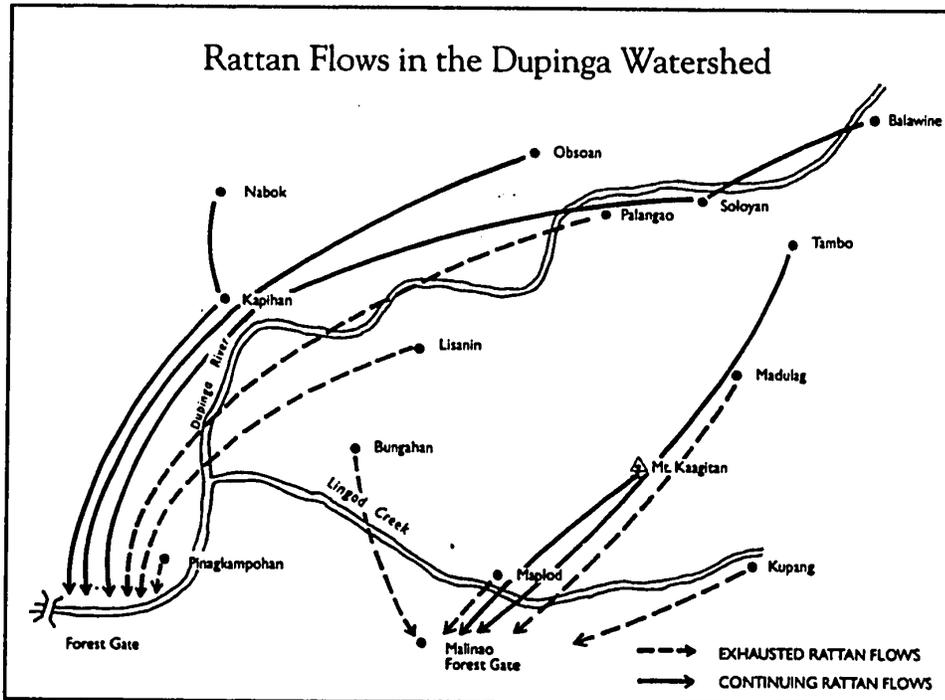


Figure 11b



Often in consort with rattan collection, hunting has been an important source of protein for Dumagat families, as well as a supplement to their cash income. Deer and wild boar are the most significant types of game, but their populations have diminished under growing pressures from both Dumagat and Tagalog hunters (see case study, p. 35).

#### ***Socio-Political Context: Conflict and Potential for Consensus***

The stabilization of Dupinga depends upon the emergence of an institutional structure and accompanying social arrangements that effectively control access to the upper forests. For any land-use management organization to be effective, it requires the support of socio-political groups within the area, including the local government. Comprised of Dumagats, Tagalogs, and Ilocanos, the communities of the Gabaldon valley engage in economic activities which can be broadly categorized into those directly or indirectly dependent on the forest resources of the watershed (see Figure 12a). Due to their continued involvement with rattan gathering and hunting, the Dumagat community has the highest forest dependency and greatest knowledge of the internal ecological and biophysical conditions of the watershed. A much smaller proportion of Tagalog and Ilocano families is directly involved in forest product gathering, while many lowland farmers are indirectly dependent on upland forests for water or raw materials for cottage industries. While the Dumagats originally settled the area, they are now the most disadvantaged minority population, economically and politically marginalized compared to the Ilocano migrant landowners and merchants. Those families involved in upland occupations in Gabaldon generally earn lower incomes than households engaged in lowland activities. Moreover, the political power and distribution of services by local government and NGOs is concentrated in the lowlands (see Figure 12b). Increasing social tensions in Dupinga may be a reflection of growing resource-use conflicts. However, conflict also presents opportunities to affect change through achieving better communication, understanding, and consensus among different user groups.

#### ***Strategies for Forest Stabilization***

Over the last few decades, farmers and forest gatherers living in the Dupinga watershed valley have become highly aware of the impact of upstream logging and mining on downstream flooding. Hundreds of hectares of rich agricultural land have been destroyed. Villagers have



**Arnold: Dumagat Hunter-Gatherer and  
Potential Forest Manager**

Arnold lives in the forest most of the year. During the dry season, he walks a full two days upstream from the valley to Balawine, where he collects rattan. In March 1993, he was able to collect 21 bundles (*palako*) in one month (each *palako* contains approximately 24 canes 12–18 meters in length), floating the canes down the Dupinga River on an inner tube. Upon reaching the Dupinga bridge, he cuts the cane into 3-meter-long poles (*palas*), which are sold for 2 pesos (P) each. Arnold can earn up to P4,000 (\$160) in two weeks on an intensive rattan collecting trip, although most collectors make much less than this in a month due to shrinking stocks.

During the rainy season, Arnold camps at Lingod creek, a tributary feeding into the Dupinga River not far from the Gabaldon valley. He cultivates a few *kaingin* patches and hunts in the surrounding forest. A skilled hunter, Arnold still catches a steady supply of game. In early 1993 he was able to trap 10 deer using snares; he captured one alive to sell for P2,000 (\$73) in the provincial capital of Cabanatuan (deer meat typically sells for one-eighth as much, or P250 per kilogram). Thoroughly familiar with and knowledgeable about the area's forest resources, Arnold's continued success in hunting and rattan collection hangs in jeopardy. He notes that an increase in the number of hunters, lack of any controls, and a dwindling supply of game and rattan are making his livelihood increasingly more difficult. If given the right opportunity and support, it may be that Arnold and others like him could play the urgent role of forest protectors and managers, allowing the forest a chance to recuperate and regain its functions and full productivity.



Figure 12a

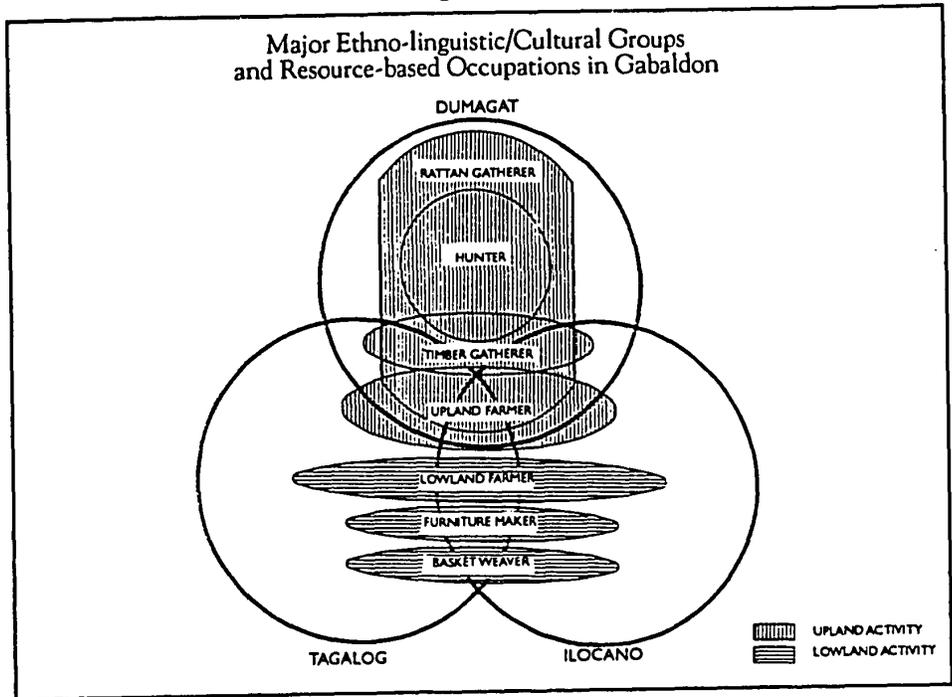
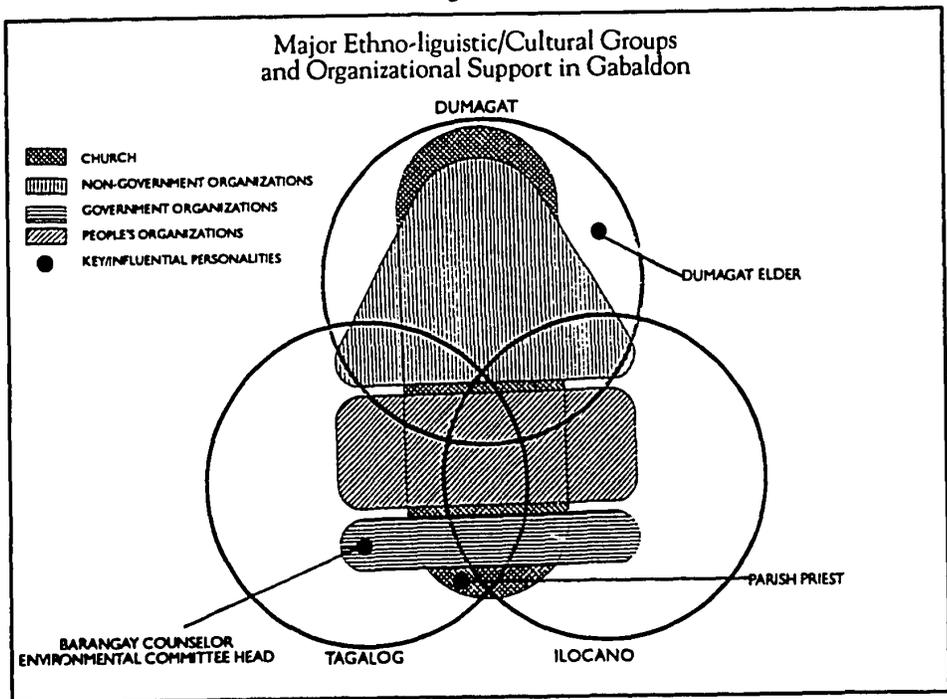


Figure 12b



witnessed first-hand the depletion of forest resources through over-exploitation. The provincial logging ban of 1978 did little to slow the rate of destruction. In 1986, a small group of community members encouraged by the local parish priest took a more direct approach. By barricading the road, they were able to block the movement of logging trucks through the valley. The priest appealed to the Environmental Research Division (ERD) of the Manila Observatory to assist the communities with longer-term diagnostic studies to explore more sustainable ways to manage the fragile watershed.

A combination of detailed studies, community meetings, participant field observations, and consistent interactions has brought into sharper focus many of the watershed's human and resource management conflicts. ERD regarded the context as well intentioned on both community and government sides but hindered by poor mutual understanding. Early activities involved the identification of conflict situations and social instabilities through interdisciplinary analysis and evaluation. The diagnostic findings are summarized in a web chart illustrating the community's interaction with its environment (see Figure 13). Still, progress in resolving user group disputes has been slow and other events have intervened. An earthquake in 1990 caused massive landslips at many junctures in the watershed, further compounding downstream flooding. The resurgence of illegal logging later that year forced the community to once again barricade the logging road and send off a protest delegation to the DENR in Manila. While certain government officials have been sympathetic to the environmental problems confronting Dupinga communities, DENR has refused to revoke mining and timber concessions in the area.

The development of a community-based watershed management agreement in Dupinga demands full participation and multi-path communication among the various sectors in the community. A series of events, community responses, and ERD interventions based on its general strategic approaches have been identified in the process (see Figure 14). Initially, social stability and reconciliation among the groups in conflict may best be achieved through a mediating "third" party—in this case an NGO. In the effort to achieve widespread multi-sectoral participation and consensus, five organizational stages have been documented by ERD (see Figure 15).

Early on, while coordinating with local DENR representatives (CENRO), ERD facilitated the selection of the third party mediator through discussions with both the local government council (Sanggu-

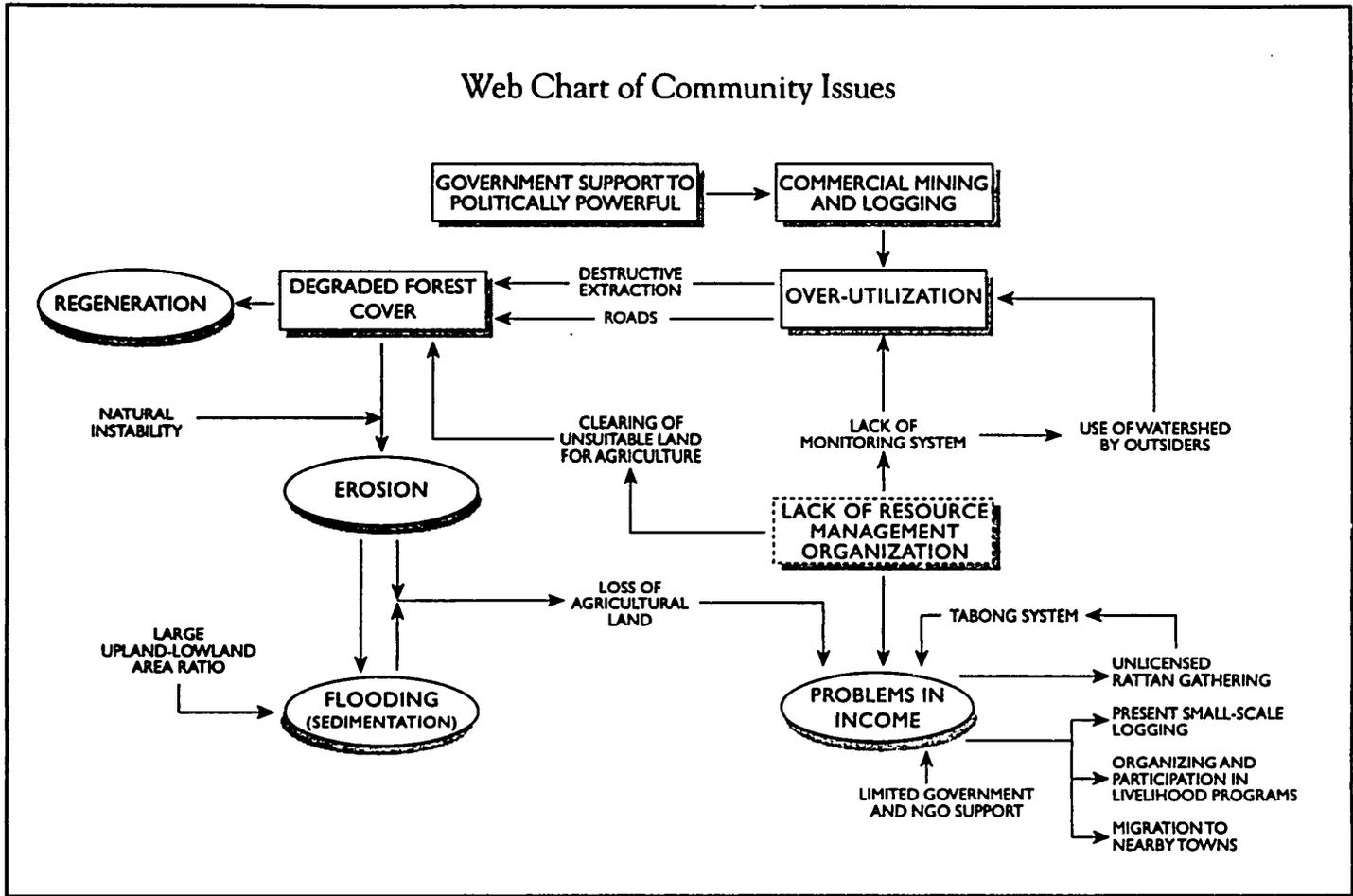


Figure 13

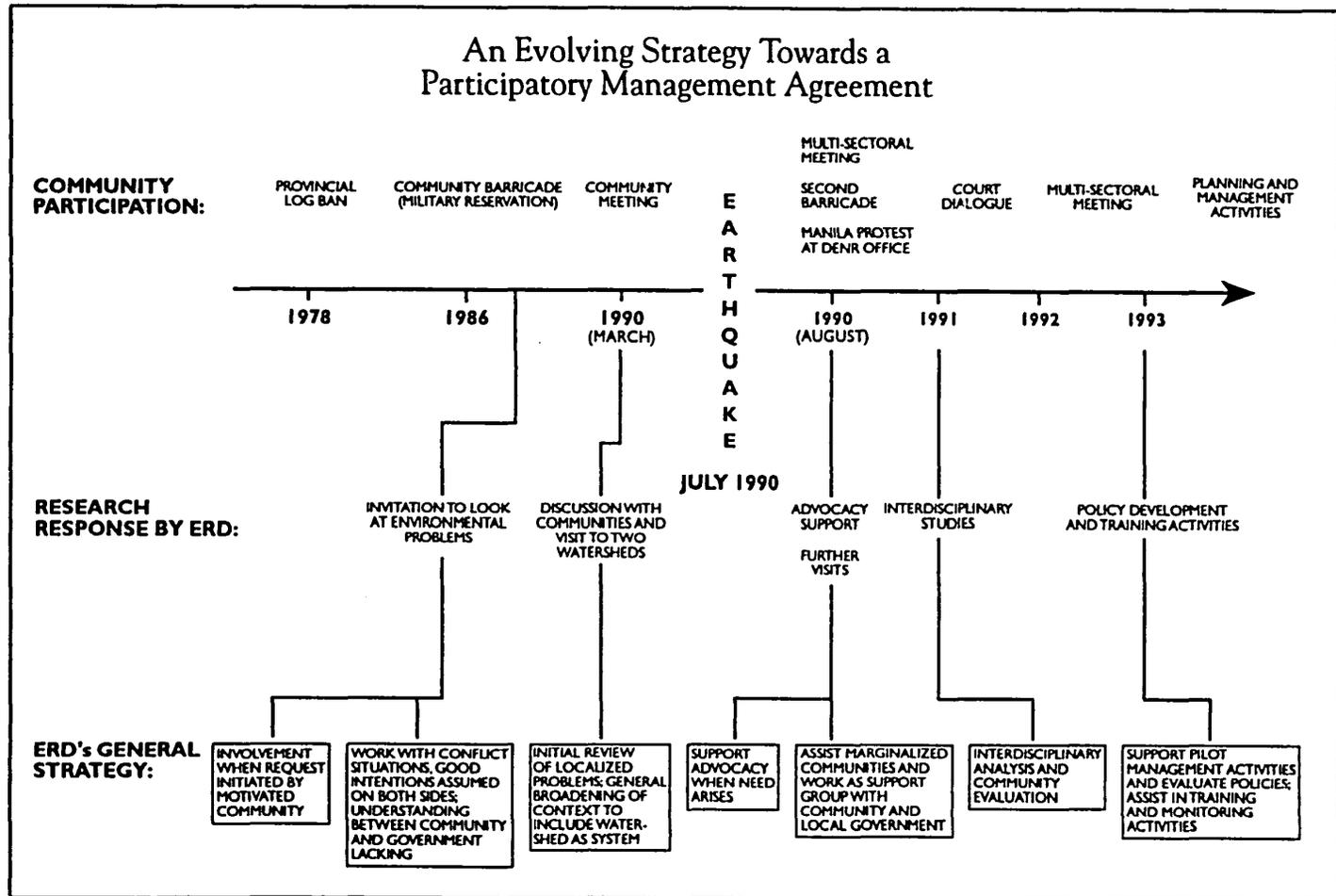


Figure 14

### Process for Multisectoral Participation in Developing a Watershed Management Strategy

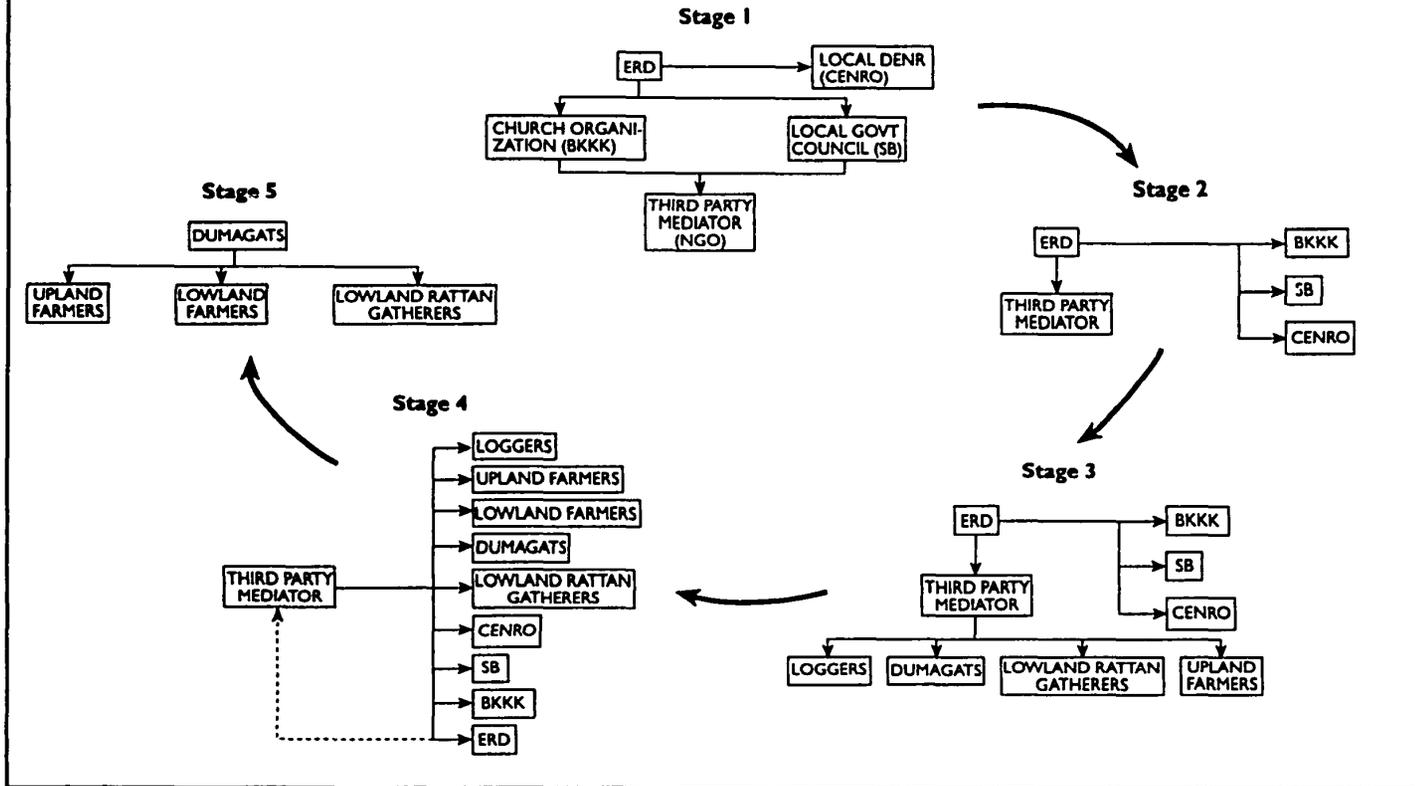


Figure 15

nian Bayan, or SB), and the church-based organization directly involved in creating greater environmental awareness (Bantay Kalikasan para sa Kinabukasan ng Kabataan, or BKKK). The responsibilities of the mediator, defined by the SB and the BKKK, are threefold: 1) establish links and develop trust and rapport among sectors; 2) conduct a series of multi-sectoral meetings; and 3) organize activities such as exposure trips into the watershed to enhance understanding of the issues. The cultivation of trust among all groups is the overriding objective of the third party mediator. After each multi-sectoral meeting, the mediator processes the data on various sectors' perceptions of specific watershed activities (mining, logging, *kaingin*, rattan gathering, and hunting) as a basis for developing strategies together with ERD for future multi-sectoral meetings.

During the first two stages, the meetings are attended by community leaders and representatives of key local government and village institutions. By the third stage, representatives from different resource user groups begin attending negotiations, with the mediator assisting them in resolving conflicts. During the fourth stage, the mediator opens the dialogue among resource users, government representatives, and the community advocacy organizations in an attempt to frame the management plan and reach a consensus among all participating groups. At present, discussants in this process are reviewing numerous proposals, including revocation of all mining and logging (TLA) leases, control of fires by establishing guidelines on firebreaks, establishment of fines and a systematic monitoring system, enrichment planting of valuable rattan species, and empowerment of Dumagat youth to act as forest patrols. During this phase, the third party becomes the primary coordinator and facilitator, while ERD simply observes the meetings. Continuous liaison with CENRO is essential in facilitating government support for the community's future resource management plans. During the fifth and final stage, a group of representatives from the primary resource users begins operationally managing the watershed, relying on other community organizations and CENRO for consultation, coordination, and technical advice. For field operations, the Dumagats, who are most closely linked to the forest, are seen as playing a principal role as stewards.

In conclusion, there is growing concern among Dupinga's lowland farmers over the erosion of their fertile agricultural lands and the flooding of their crops, while upland forest gatherers and cultivators are encountering a rapidly degenerating resource base. Their shared senti-

ments have provided a basis for developing a strong community coalition for improving the management of the watershed. Ultimately, building the institutional and operational capacity of a watershed management organization depends on creating a clear understanding of upstream-downstream linkages and resource problems, resolving conflicts, reaching a consensus regarding access controls, and establishing regulatory mechanisms to ensure sustainable use practices. By identifying management opportunities, user groups can play specific roles in developing land-use plans that improve interactions between upland and downstream communities and ensure the integrity of the watershed as a system (see Figure 16).

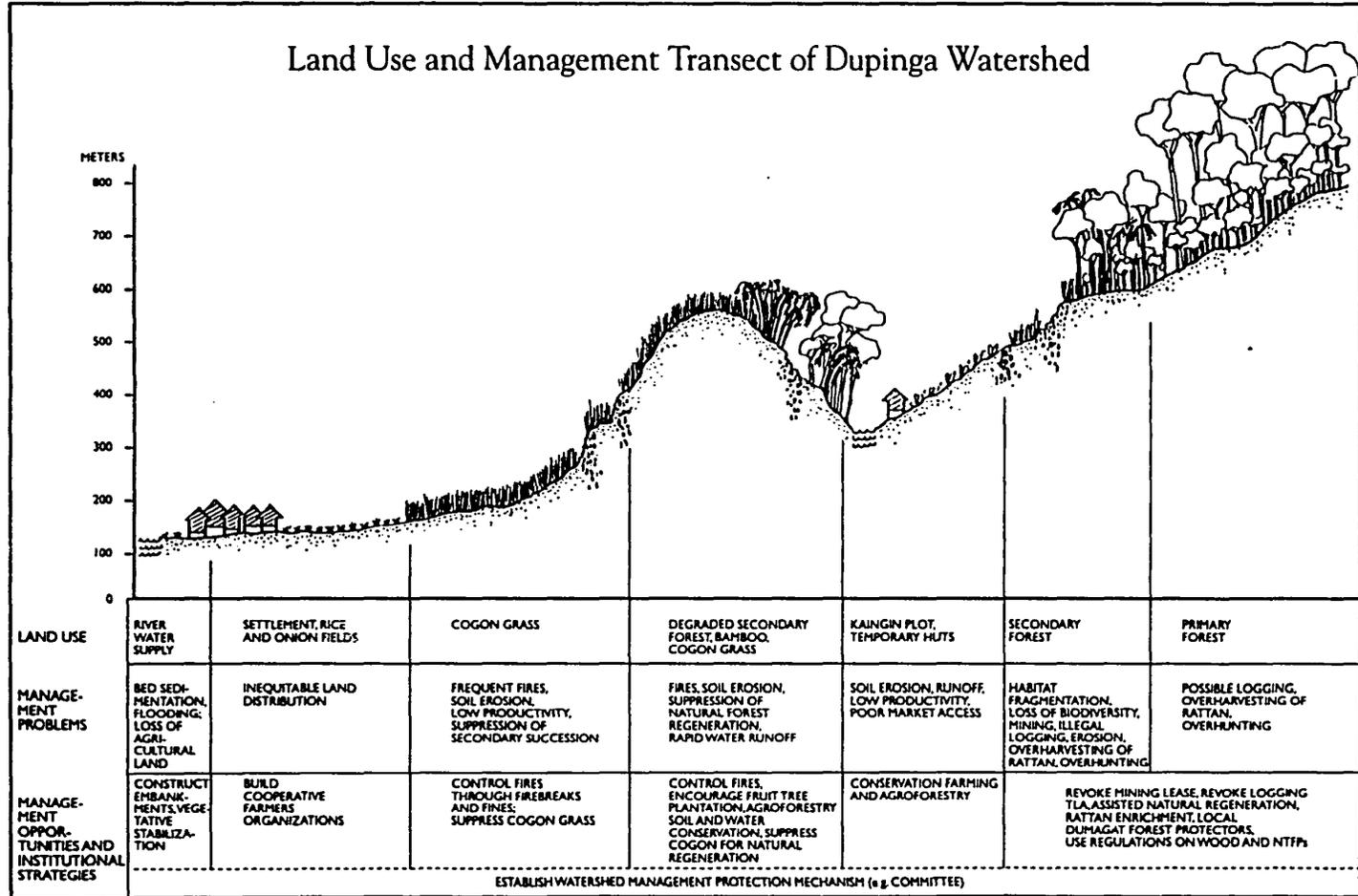


Figure 16

## PULANGI: SECURING THE UPPER CATCHMENT

### *History of Lumad Retreat*

Following World War II, the richly forested watersheds of northeastern and southern Mindanao were targeted for logging. Based on the parity agreement signed at the Philippines' independence, U.S. multinational companies took full advantage of their "equal" rights to resource exploitation. American timber firms such as Weyerhaeuser, Georgia-Pacific, Boise Cascade, and Findlay Millar operated in rapid and systematic fashion to extract Mindanao's valuable commercial dipterocarp forests.<sup>27</sup> The logging momentum continued after these companies were privatized by Filipinos. Today, the ecological aftermath of decades of rampant upland forest destruction continues to unfold in the valleys below. Logging in Mindanao's primary watersheds between the 1950s and 1970s has resulted in massive upland erosion and lowland siltation, combined with rapid runoff and flooding. In 1981, heavy rains spilling into the Agusan River were blocked by huge silt deposits near the mouth of the river, causing a series of floods which killed hundreds and left thousands homeless.<sup>28</sup>

The Pulangi watershed, the Philippines' second largest, covers an area of 1.8 million hectares. The upland forests are ecologically fundamental to the vast Pulangi agricultural basin to the south, as well as the smaller Agusan River basin to the northeast (see Figure 17). The upper watershed also protects a major dam at Maramag which supplies hydroelectric power and irrigation water to southern Mindanao. The dam has never reached full capacity since it was completed in the early 1980s and is now rapidly silting up. Furthermore, additional proposed dams will dislocate lowland communities and place further pressures on upland resources.

Today, the loggable commercial species have been nearly exhausted in Mindanao. Satellite imagery indicates that only 5.5 percent of Bukidnon Province, which encompasses the Upper Pulangi, still retains old growth dipterocarp forest, with 7.7 percent under mossy upland forest, most of which is confined to critical mountain ridges and slopes.<sup>29</sup> Despite their hydrological and ecological values, and their extreme scarcity, these final dipterocarp remnants are still being logged.



Upper Pulangi watershed with valley farms and upland logged-over forests.

**Best Available Document**



Corn sprouting in Bukid-non household's swidden field.

<sup>45</sup>  
**Best Available Document**



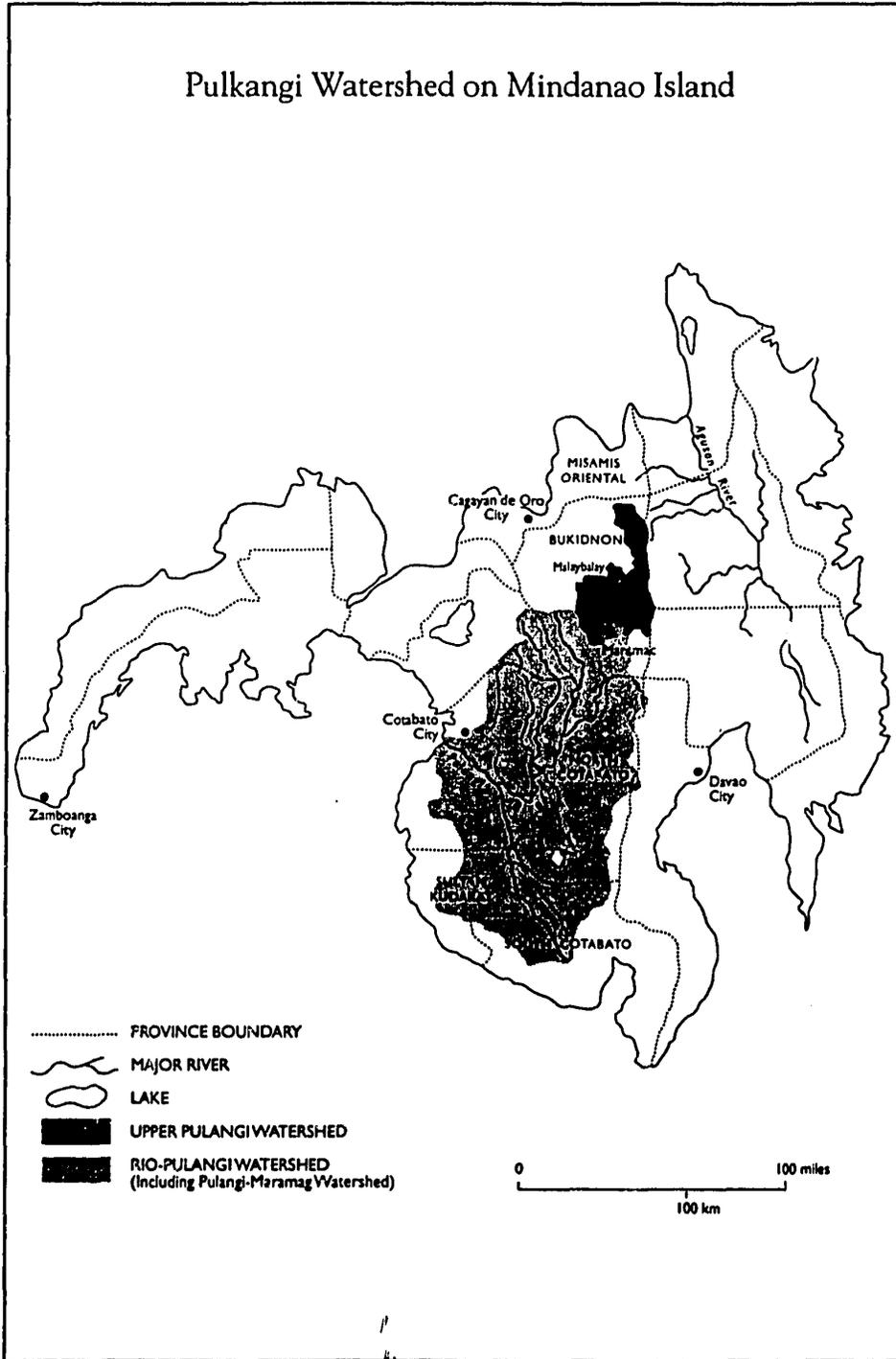
Visayan migrant's home adjacent to his cassava and corn patch in the Upper Pulangi Valley above St. Peter village.



Bukid-non boys playfully climb papaya trees in the family's swidden fields.

Figure 17

### Pulkangi Watershed on Mindanao Island



Historically isolated, the Upper Pulangi watershed was originally inhabited centuries ago by indigenous Lumad people, comprised of Bukid-nons, Tala-andigs, Matig-salugs, and Manobos, as well as other cultural groups. Most of the land was extensively covered with primary forest. In exchange for salt, sugar, cloth, and liquor, the Bukid-nons engaged in cultivation and trade of a variety of crops, including corn, abaca (hemp), coffee, rice, and copra, with wealthy coastal Visayan and Chinese merchants. In combination with increasing contacts with coastal traders as markets expanded, the church began influencing traditional cultural patterns in the late nineteenth century by baptizing and settling the Bukid-nons in grassland townships. Starting in 1907, a campaign was initiated by the Americans to protect the Bukid-nons from dominance and economic exploitation by lowland migrants, primarily those from the Visayan Islands.<sup>30</sup> In the process, the Bukid-nons were forced into lowland settlements to plow fields and take advantage of public education. Those Bukid-nons who resisted resettlement and remained in their homes in the mountains risked attack by constabulary soldiers. The decline of the American presence in Bukidnon Province during the 1920s and 1930s ushered in a period of increasing migration. From the end of World War II to the late 1970s, the provincial population burgeoned, increasing by over 700 percent (63,470 to 532,818). Large multinational agribusinesses expanded, intensifying land-use pressures and generating conflicts between the Lumads and the migrants.<sup>31</sup>

The Lumads' movements progressively deeper into the forest in an attempt to escape domination by Visayan migrants and logging companies continue today. Even before the war, migrants had penetrated into the uppermost narrow valley of the Pulangi headwaters as far as Indalasa and Caburacanan. Since the early 1960s, four major logging concessions have shifted from Malaybalay into the area (see Figure 18). Following the logging roads over the past few decades, significant numbers of additional migrants have entered the upper reaches of the Pulangi, clearing remnant forest tracts to plant corn and rice. The migrants have generally become the dominant group within the local community structure, resulting in the quiet retreat of the Bukid-nons up the mountainous watershed (see Figure 19). Concessionaires have also forced Lumads to abandon their ancestral lands and move further into the watersheds to practice a combination of *kaingin* and hunting/gathering on marginal forest lands.

Figure 18

# Timber License Agreements: Upper Pulangi Watershed

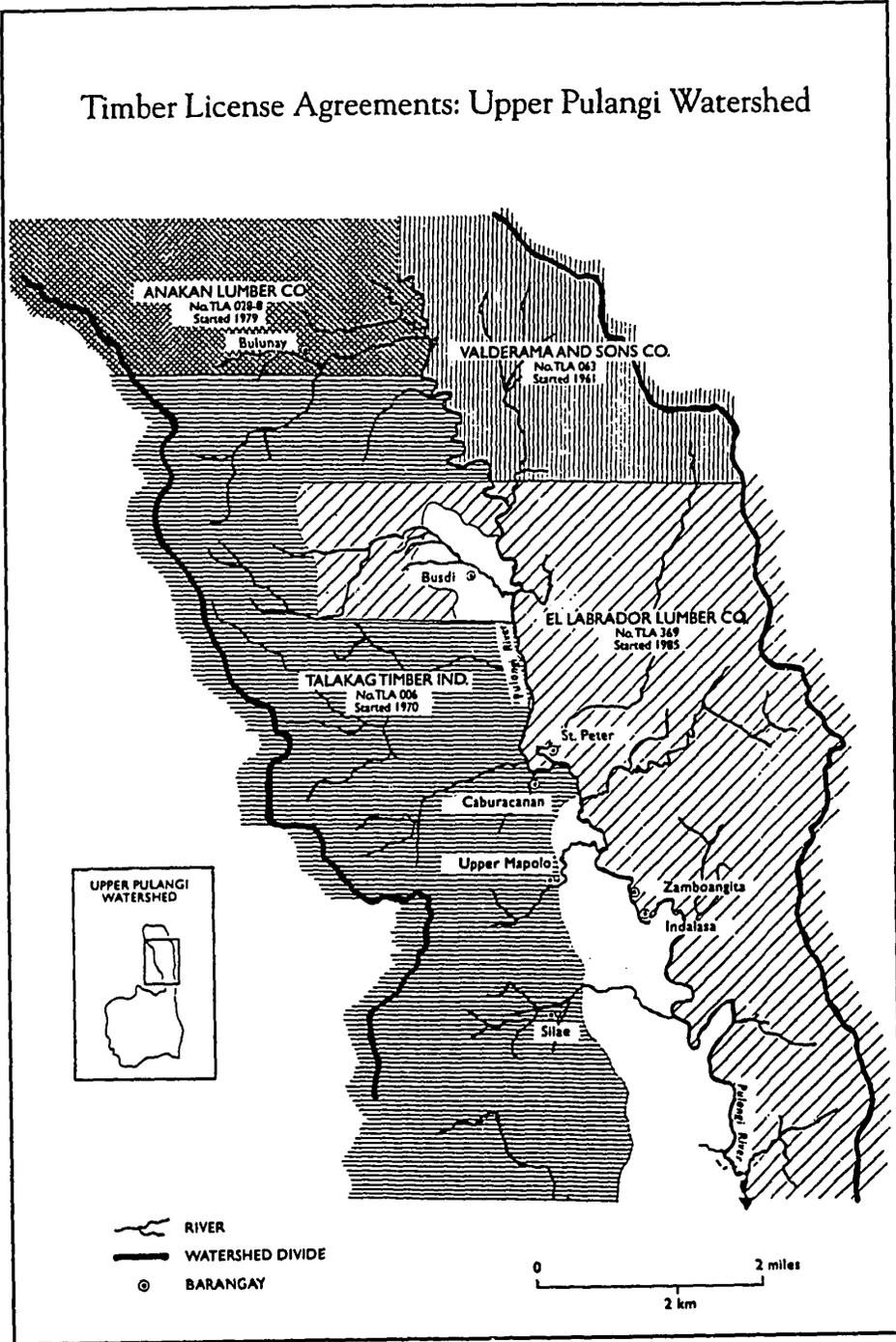
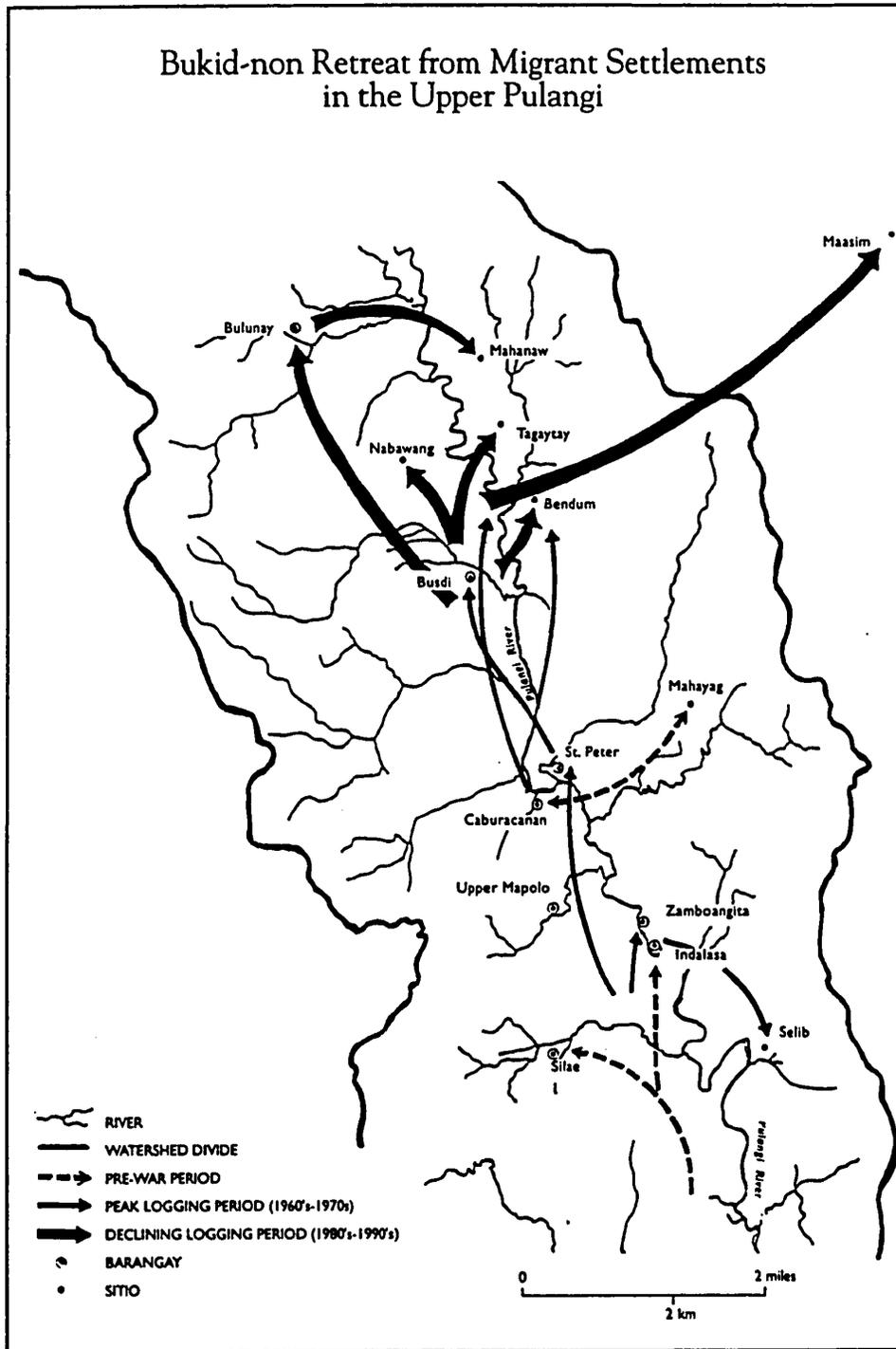
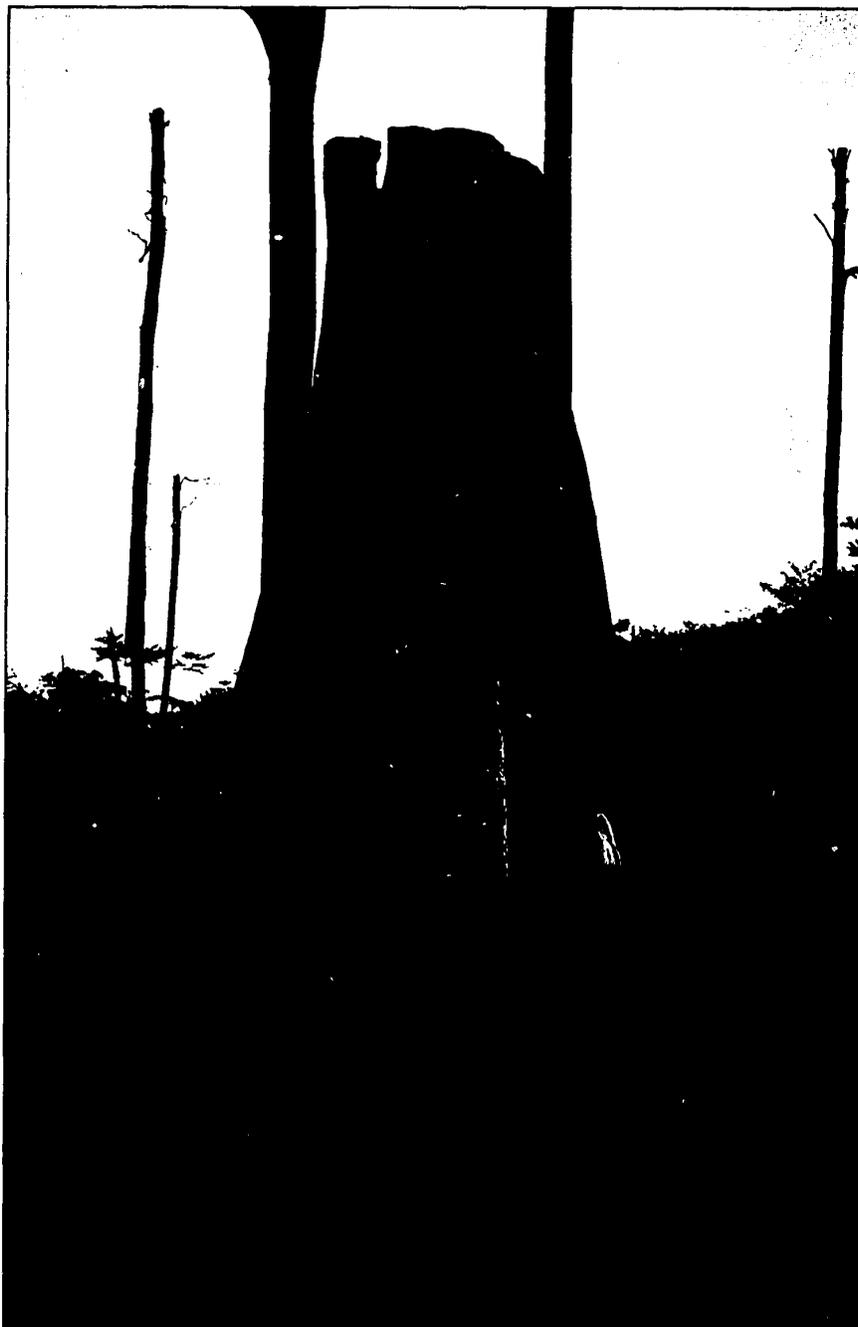


Figure 19



50  
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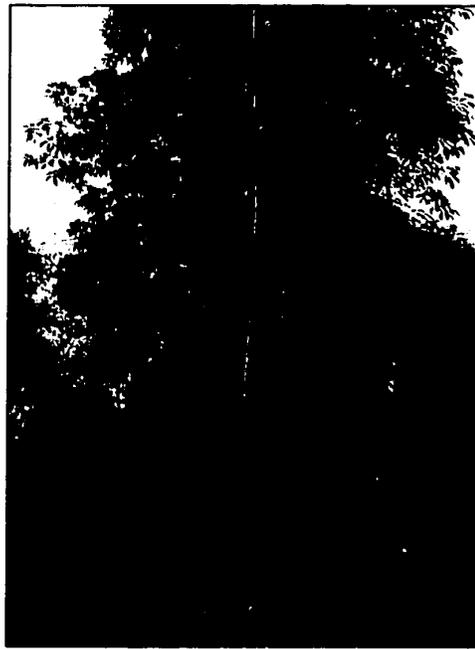
Tree stump of a rainforest giant stands alone in farmer's field.

51

**Best Available Document**



Once loggers leave the area, tribal and migrant people use saws and mallets to split boards for domestic needs.



Near the ridgetops of the Upper Pulangi watershed, tribal children ascend on the lianas of large forest species.



Upper Pulangi River snakes through dense secondary forest growth but runs muddy brown due to erosion from upstream logging and farming.

52  
**Best Available Document**

### *Human Ecology of the Upper Pulangi*

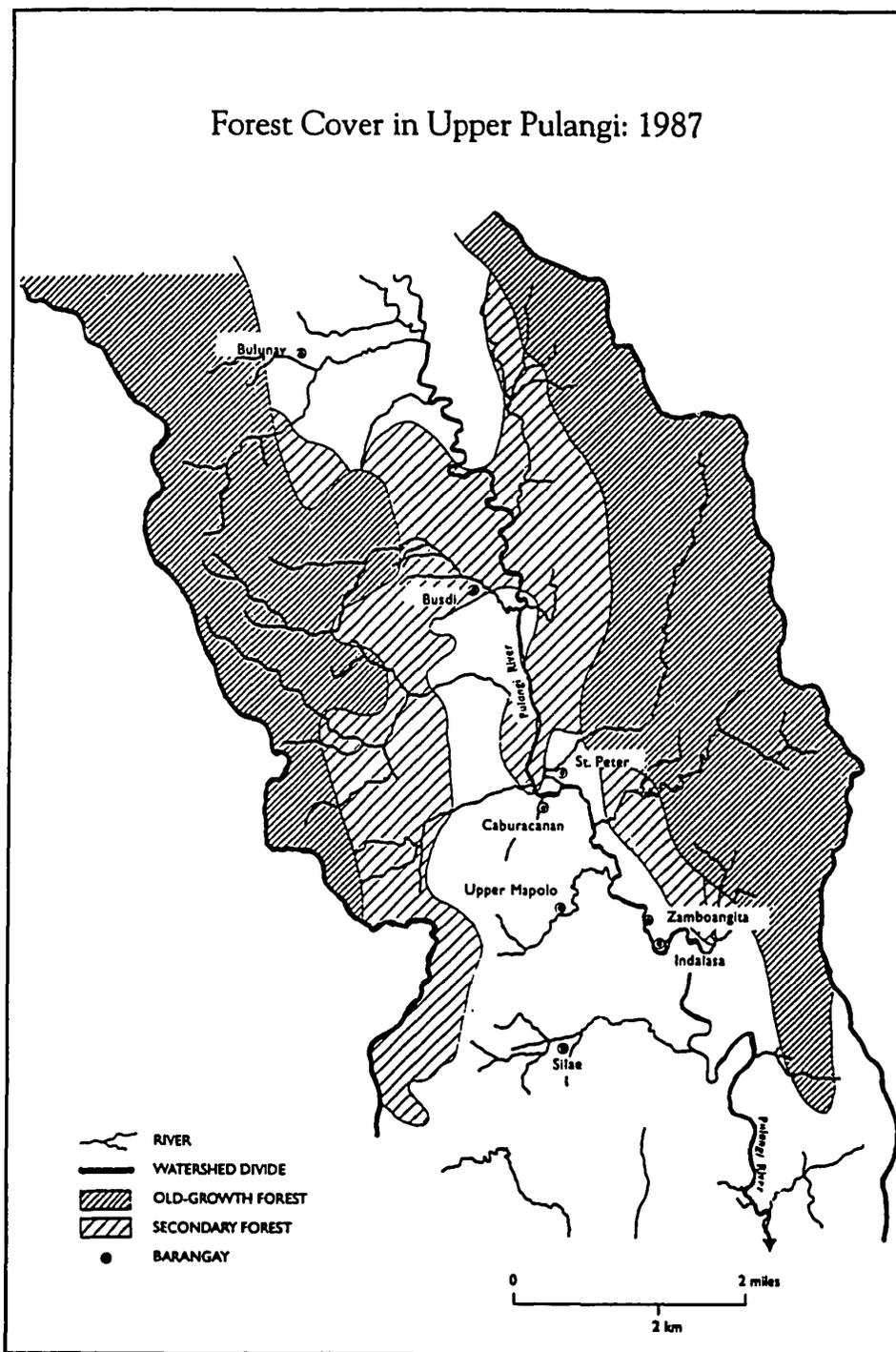
While still ecologically strategic, the remaining old growth and mossy forest of the Upper Pulangi is confined to ridgetops above 700 meters' elevation. The majority of the logged-over secondary forest at lower elevations suffers successive degradation due to increased clearing for corn, unsustainable cultivation practices, and cyclical fires (see Figure 20). Although it has attracted very little attention, this portion of the Upper Pulangi, which flows through a narrow, 70-kilometer valley, is a crucial catchment area for the larger Pulangi basin.

The Bukid-nons have inhabited the Upper Pulangi for generations, tapping their rich ethnobotanical knowledge to hunt, gather, and cultivate small swidden plots within the forest environment. Datu Nestor, an elder leader of the Bendum village community, originally migrated with his family one generation ago from Mahayag. First moving down to Caburacanan in the 1950s, he proceeded to St. Peter in 1979 and finally settled in Bendum in 1985. Other Bukid-non families followed him. In the early 1970s, the trade in rattan grew, and many families engaged in the collection of small diameter (*aroroq*) and larger diameter (*tumalen*) species. Trucks would arrive monthly to haul the rattan away. Competent collectors could harvest 400 poles (9-foot lengths) of *aroroq* per day, worth up to P120 (\$5). Today, the practices of unregulated overexploitation have greatly diminished the natural stock. Although there is still gathering in the upper watersheds, former collectors are seeking other sources of livelihood. Datu Nestor believes that *aroroq* could be planted along the streambanks, where it thrives, and then systematically harvested, still leaving an adequate supply for regrowth. Expressing the need for a longer-term management perspective, he reports that the rattan can typically grow to harvestable size in six years, although the larger diameter varieties would require a ten-year gestation.

The community in remote Bendum continues to be highly dependent upon the forest, hunting wild boar, birds, snakes, frogs, and the rare macaque. In addition, they gather rushes for weaving, betel nuts, calmansia citrus, ferns, mushrooms, and honey. Gum from the *almaciga* tree (*Decussocarpus wallichianus*) is also collected and sold. Banana hemp or *abaca* is dyed and woven by women into traditional *kamuyot* cloth, now becoming popularized and marketed domestically.

Lowland migrants have typically established rice fields along the rivers and corn on the lower slopes. During the 1980s, coffee was cultivated alongside corn on the valley mid-slopes. Bukid-non households

Figure 20



also compete for land to grow corn and coffee on these slopes, while continuing with their traditional mixed gardens in logged-over areas higher up the valley slopes. Rattan-collection and hunting ranges begin only after a several hour walk far into the secluded patches of secondary and primary forest (see Figure 21).

Numerous problems arise for slope-dwelling communities in the watershed, including moderate to high soil erosion, nutrient leaching, rapid runoff, declining productivity, and general lack of social services. Families in the valley suffer from inadequate water supply in the dry season and limited geographical areas in which to expand their wetland cultivation. Crops such as coffee and corn tend to generate low returns due to infestations with the coffee bean borer, minimal fertilizers, high transport costs, and poor markets (see Figure 22).

### *Rise of Environmental Activism*

Over the past decade in Bukidnon, community groups have organized to protest logging and its negative environmental externalities. In 1989, villagers barricaded logging roads in San Fernando, located in the southern Tigwa watershed of the Upper Pulangi. Thirteen community representatives traveled to Manila and fasted in front of the DENR office in an effort to obtain a government order which halted logging in the residual old growth forest. Letters from the protesters were sent to influential individuals and institutions, requesting immediate cessation of the logging. Both the public and private sectors were very supportive of the community representatives in Manila. High-profile meetings were scheduled between the fasters and the DENR, including select government officials such as President Aquino. On the eighth day of the fast, an agreement between the villagers and the DENR was publicly announced. The agreement reiterated the government's concern for the forests in Bukidnon Province and outlined activities and processes for implementing forest protection. Among these were the enlistment of twenty forest guards (mainly tribal Manobos) to patrol and protect the Tigwa forests, the suspension of agribusiness rattan licenses, and a promised enforcement of a future logging ban in Bukidnon. There was also a promise to provide major funds for community reforestation in the area. Unfortunately, many of these commitments by DENR were either short-lived or have yet to be realized.

Nonetheless, environmental problems are becoming the leading political issues for community activism in the lowlands. While the escalating concerns of migrant farming communities over a degrading

Figure 21

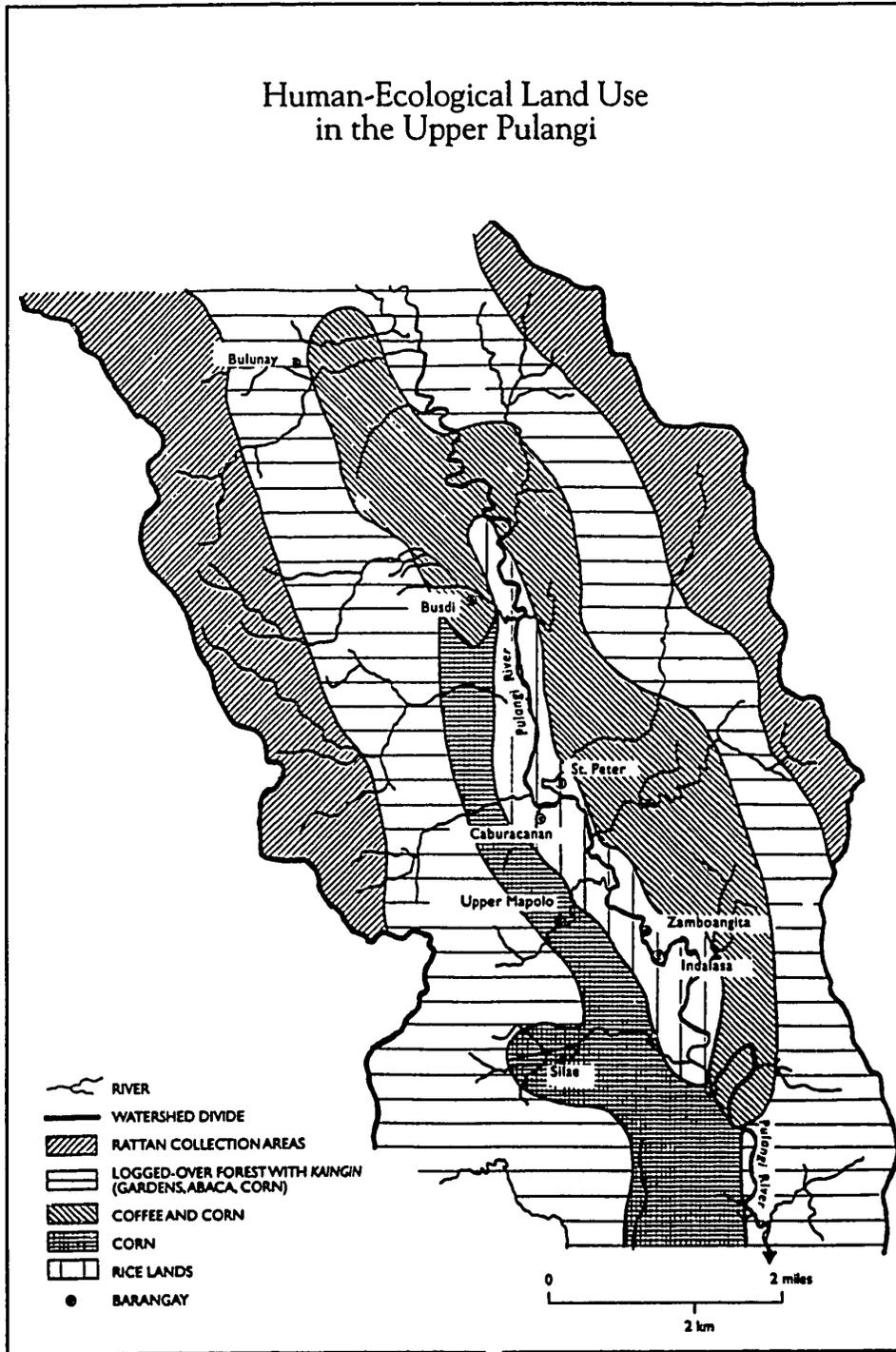
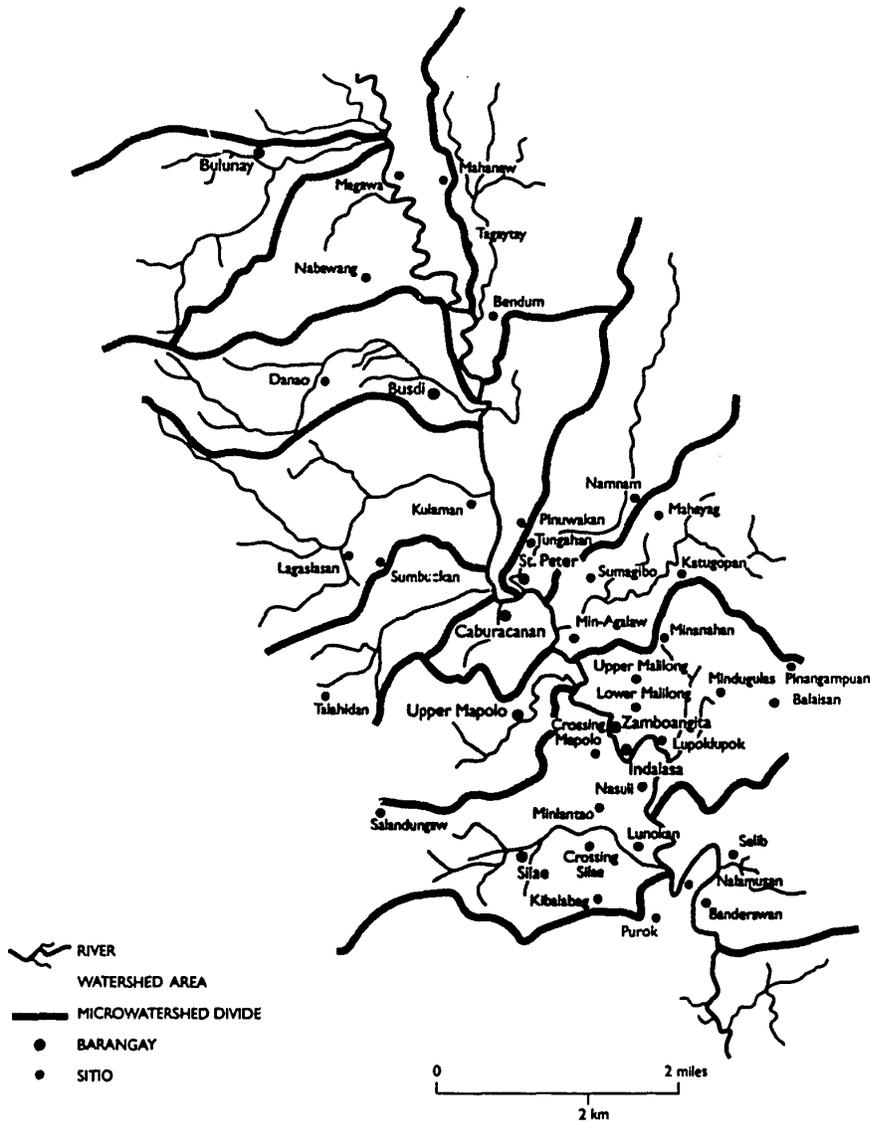


Figure 22

### Proposed Microwatershed Management Units in the Upper Pulangi



environment are significant, the tribal Lumads possess the in-depth, practical knowledge of the environment needed to manage and monitor these resources effectively. Yet due to their historic and progressive socioeconomic marginalization, a concerted effort will be required to bring them into a dialogue with other resource user groups and vest them with the authority to participate actively in the formulation of management policies and regulations.

In the past, central government reforestation schemes have bypassed tribal peoples, encountering numerous technical and institutional problems due to an inadequate understanding of the local ecosystem, including its socio-political context. Tree survival rates have been low because local groups have not been empowered to ensure proper plantation protection, management, and benefit-sharing. Efforts to establish an institutional basis for sustainable forest management systems which are not adequately rooted in the highly localized ecology and traditions of indigenous resident communities will likely meet with a similar fate.

#### ***Community-Based Watershed Management Scenario***

As part of the process of formulating an integrated management plan for the Upper Pulangi, migrant peoples and indigenous upland tribal communities will need to work as partners with government and private sector interests to resolve existing resource conflicts. Emerging watershed management strategies must focus on stabilizing Lumad community resources as a top priority. According to current planning, community organizers will assist villages in developing long-term resource management plans for their respective microwatersheds. Some community groups have already initiated efforts to reach agreements regarding the territorial divisions of the upper watershed into operational "microwatershed" management units.

Twelve small tributary streams feed the Pulangi River. It is proposed that jurisdictional responsibilities for the protection and management of these twelve microwatersheds be allocated to those tribal communities which are both motivated and strategically situated at critical access junctions of each catchment (see Figure 22). These hamlets would be assisted in forming resource management committees, which in turn would be affiliated with the more centralized lowland *barangays*. The proposed microwatershed management planning will include an initial land-use site analysis, complemented by extended negotiations with the community to identify local problems, priorities,

and opportunities (see Figure 23). This process will include micro-watershed mapping and community profile surveys. Through steady interaction and dialogue with the communities, villagers will be encouraged to explore various options for protecting the remaining forest, while also increasing its productivity. In light of the rapid depletion of natural rattan stock, enrichment planting is one of the silvicultural strategies under consideration. As the price of corn is extremely low and the quality of coffee very poor, certain crop management improvements and species alternatives are also being explored. It is clear that many institutional and technical options are available to improve the watershed's productivity and management. Ultimately, communities will need usufruct tenure security in order to invest their labor and resources in protecting the environment and utilizing the resource base sustainably.

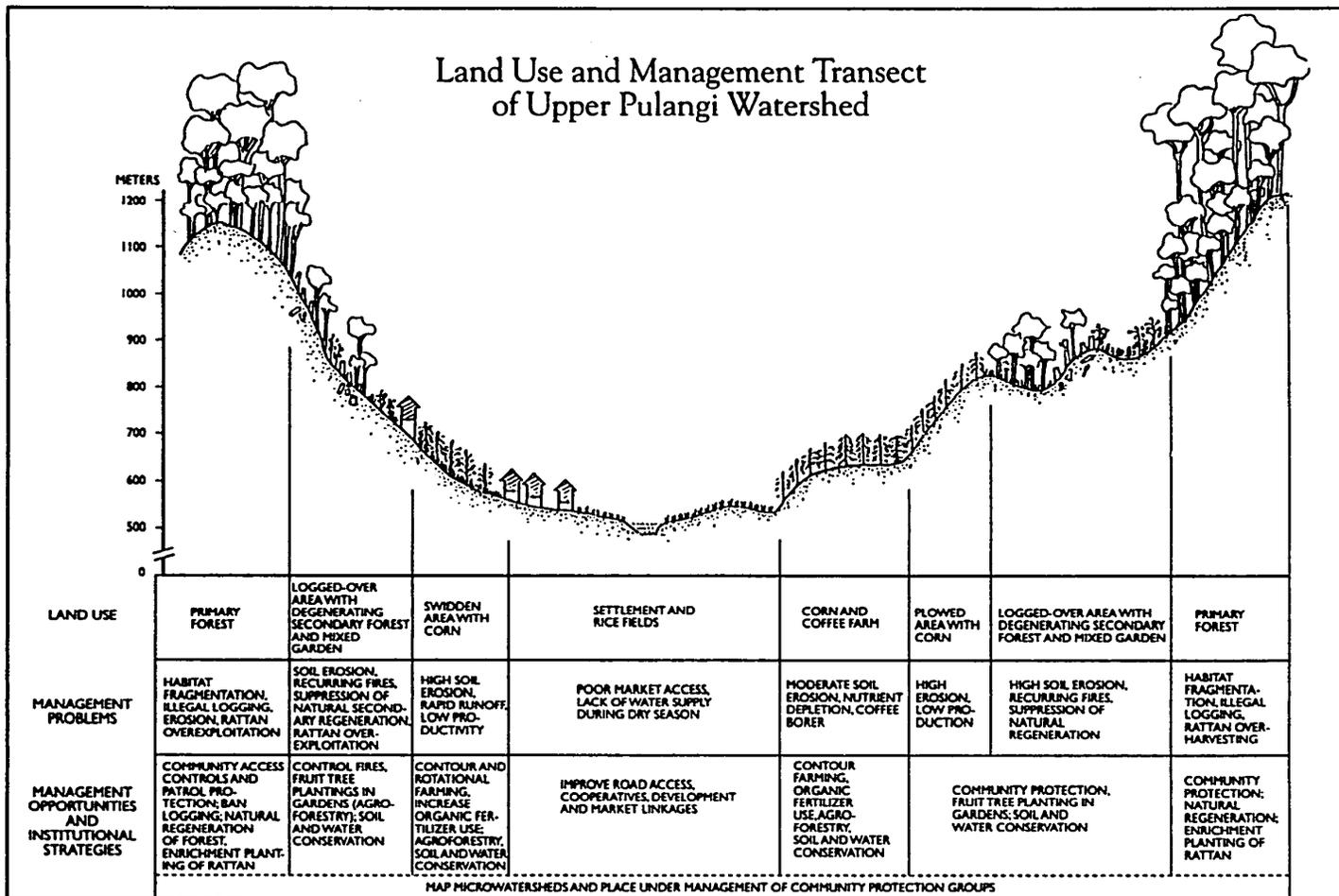


Figure 23

## SUMMARY

Throughout the Philippine uplands, tribal communities have been forced by more powerful groups to retreat from one site to another, losing control of their ancestral homelands. Impoverished families continue their migratory onslaught to the uplands—primarily due to the failure of government policies and programs to effectively address problems of unemployment and inequitable land and income distribution in the lowlands. Powerful logging and mining interests have created major ecological problems for short-term, inequitable economic gains, leaving behind a depauperized resource base upon which upland tribal and migrant communities must struggle to survive. Despite numerous progressive populist policies, combined with highly visible dependencies on forests and watersheds, upland communities have little legal control over these resources. Instead, control continues to rest primarily with government agencies and political powers, who maintain the status quo with minimal presence on the ground, or with corporations controlled by elites who often have no stake in long-term sustainable management. In 1988, 1,245 forest concession and grazing leaseholders controlled 5.8 million hectares of public lands, representing a full one-third of the state's domain. Juxtaposed alongside the several thousand, typically absentee, families that have acquired rights to these natural riches, the uplands are populated by over 17 million forestland residents. Only a small fraction of these upland dwellers have seen improvements in their tenure security and welfare as a result of over a decade of community forestry programs.<sup>32</sup> It is these upland inhabitants who have so much to potentially contribute to forest management. They would benefit greatly if empowered as local forest guardians, helping stabilize the upper watersheds for their own resource utilization and for the benefit of downstream farmers and urban dwellers.

The environmental problems arising from poorly regulated upland use over the past four decades have so undermined critical forest watersheds in the Philippines that any further commercial logging will incur direct and indirect costs far higher than any income it could possibly generate. Fire control, natural regeneration, enrichment planting, agroforestry, and conservation farming can begin to rehabilitate

the uplands, but it will be imperative to establish effective access controls and local participatory management institutions that only resident communities are strategically positioned to organize and regulate. Unless legally empowered, marginal communities will lack the support, incentives, and authority to act with confidence and self-reliance as managers. The decentralization of management authority to upland communities also necessitates the imminent cancellation of remaining leaseholds currently in the hands of elites, a definitive step the Philippine government has not yet been willing to take. In both Dupinga and Pulangi, logging and mining operations are often backed by local political powers, military outposts, and armed company operatives. In contrast, disadvantaged upland communities have only the support of the church and committed NGOs. No matter how well conceived in Manila, community forest policies will do little to help tribal and migrant communities unless there is strong political will on the part of the government to confront these coalitions of power, which so closely guard the vested interests of the rich.

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