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PROCEEDINGS OF THE TWENTY-FIFTH INTERNATIONAL CONFERENCE OF AGRICULTURAL ECONOMISTS

*Held at Durban, South Africa
16-22 August, 2003*

Edited by
David Colman, University of Manchester,
England
and
Nick Vink, University of Stellenbosch,
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2005



**Blackwell
Publishing**

Economic development and environmental management in the uplands of Southeast Asia: challenges for policy and institutional development

Agnes C. Rola*, Ian Coxhead**

Abstract

Using a Philippine case study site, the forces driving the recent evolution of economic behavior and institutional arrangements in upland and forest margin areas of Southeast Asia are considered. In early modern development, subsistence agriculture using long-phase forest-fallow rotations and regulated by customary law was replaced by more intensive, commercially oriented farming systems, a process heavily influenced by internal migration to the agricultural frontier. Traditional land and resource use institutions were quickly displaced during this shift—both *de facto*, through the actions of colonists, and *de jure*, through the state's assertion of ownership over forests and uplands and the introduction of private title to agricultural lands. Yet the effective implementation of natural resource use constraints lagged substantially behind the pace of agricultural development and forest exploitation, resulting in a period in which high demand for such resources coincided with virtually open access. These processes were noticeably subject to the influence of policies and reforms affecting markets, prices, and institutions.

JEL classification: H73, O13, Q56, Q58

Keywords: institutional evolution; economic development; uplands; resource management; devolution

1. Introduction

...Once upon a time there were traditional patterns of order and balance between a people's needs and the sustainability of their resources. Authority and accountability were close to the source of need and nature. Then came a period of disorder and destruction as resources were redefined to meet centralized, commercial goals of distant accountability and whimsical market forces.

—William R. Burch, Foreword to *Keepers of the Forest* (Poffenberger, 1990)

In the past 50 years the uplands of Southeast Asia have been subject to timber extraction, intensified subsistence farming, plantation establishment, and other commercial activities that increasingly include highly capital-intensive horticulture and livestock-rearing

operations. This expansion and commercialization has been driven by demand factors, especially the search for land and forest as complements to labor; supply factors, including unregulated access to many resources, and reduced transactions costs due to the expansion of roads and other infrastructure. In the absence of appropriate policy and institutional support for environmental management, these activities have denuded forest cover, polluted rivers, eroded soils, and diminished biodiversity. In many areas, the deterioration of the natural environment has reached the point at which the viability of future production activities on the same resource base is in question.

Case studies of resource depletion associated either with rapid economic growth or with a poverty-driven "optimal path to extinction" (Perrings, 1987) abound in the literature. Many of these identify "institutional failures" for creating open access to natural resources as an enabling condition. A longer-time perspective, however, reveals that open access was not always the

* University of the Philippines-Los Banos, Laguna, Philippines.

** University of Wisconsin-Madison, Madison, WI, USA.

norm in the uplands; nor, if the experience of comparable areas in wealthy countries is a guide, does this institutional failure persist as economies develop. Clearly, the ways in which economic growth interacts with institutions and influences their evolution are potentially important determinants of the uses of natural resources and thus (through biofeedback mechanisms) of the health of upland economies.

Historically, economic development in the uplands was accompanied by distinct phases of institutional development (Table 1). Prior to colonization or massive internal migration, when upland populations were sparse and production was primarily for subsistence, customary laws governed natural resource use. Tribes and communities managed the resources over which they had control. These institutions were effective as a means of governing the commons, not least because demand for the resources was low, technologies for their exploitation limited, and transport infrastructure was poor. Long-rotation bush farming fallow systems, typical of this era of development, are widely regarded as "sustainable."

Economic development and population growth in coastal cities and lowland rural areas quickly changes the upland economy. Commercialization (driven by the expansion of domestic and global markets), migration and natural population increase, and the introduction of new technologies all create new pressures on the resource base. Customary law cannot accommodate

such conflicts. In this second phase of institutional development, traditional resource use institutions are swept aside; the state assumes the lead role in controlling resource use and access, and new resource management institutions are imposed from the outside. However, even though local governments and local offices of national resource management agencies may be established, these have no autonomy and little effective authority. State power is thus low at the frontier; the resource base becomes, in effect, open access. Moreover, not only is there no political will for environmental or resource use measures that might reduce the current income-generating opportunities of people living in severe poverty amidst a perceived abundance of natural resources, the state typically *promotes* resource depletion as a means of generating household income and fiscal revenues. What follows is rapid deforestation, shortening of fallow periods, and general degradation of soil and water resources.

This "period of disorder and destruction" was characteristic of many upland regions of Southeast Asia from the 1960s through to the 1990s, during which time the region had the highest annual deforestation rate in the world (FAO, 2001), even as its leading economies grew at historically unprecedented rates. In highly repressed economies such as Myanmar and Indochina the state itself became the primary agent and entrepreneur of resource depletion, having closed

Table 1
Economic development and institutional evolution for environmental management: A framework of analysis

| | Prehistory/subsistence economy | Early development | Late development |
|--------------------------|---|---|---|
| Economy and resource use | Low population growth Resource abundance Subsistence Slash and burn, long fallow period considered "sustainable" | High population growth, migration Increased competition of resource use Intensive agriculture Commercializing economy Shortening of fallow period | Declining population density Highly commercial economy Declining resource use intensity (i.e., reforestation programs) |
| Institutional evolution | Customary law; community resource management | State-designed institutions with no practical checks Property rights not well defined, thus resulting to "land grabs" | Ideally, Central and local institutional innovations increased Community stewardship of environment Property rights well defined Alternately, Local elite gains power Incentives not compatible with benefits |

off most other means of generating jobs, government revenue, and foreign exchange.

In Southeast Asia's more open economies, economic maturity and the end of the demographic transition has ushered in a third phase, one in which lower labor force growth and rapid job creation outside of agriculture greatly reduces population-driven demand for upland land. This has potentially large implications for the governance of resources. This phase may result either in continued rapid resource depletion or in a shift to more conservative strategies. Which of these is more likely to occur will depend on the speed with which institutions catch up with the pace of economic growth. The countries of the region currently present a fascinating array of trends, with no clear, single pattern having emerged.

In this third phase, there is growing community demand for environmental quality and resource conservation. This trend is complemented by a more general decentralization of power and authority, as currently is taking place through formal means in all the large economies of the region. In the best situations, decentralization plus local demands for more ecologically friendly development are complemented by national laws and policies; in the best outcomes, national agencies, local governments, and community groups collaborate to design (and more importantly, to implement) resource management and policies. In the worst cases, however, with reduced power at the national government level and a "business as usual" attitude on the part of local elites, Burch's "disorder and destruction" continues, or even worsens.

In this paper the focus is on the transition to the third phase. The impact of economic development on the upland environment is examined, given the dynamics of decentralizing functions for environmental management. The paper, in contrast with aggregative, cross-country studies, is founded in extended study of a specific region in the Philippines.¹

The paper is divided into six sections. Section 2 discusses economy-environment linkages as gleaned

from Southeast Asian experience. In section 3 the policy and institutional context of forest and upland land management is investigated. In the remainder of the paper the focus is on decentralization as a new and important factor in upland resource use. In section 4 the outcome of this decentralization policy on institutional structures and environmental governance in selected Asian countries is summarized. Subsequently, in section 5 a Philippine case study of the realities and challenges of resource management in a decentralized setting is presented and discussed. The final section presents a brief conclusion.

2. Economy-environment linkages

Production almost invariably generates environmental damage in the form of pollution and/or natural resource depletion, and it follows that such damage increases as an economy expands, other things equal. It is well known, however, that the environment-economy relationship can be nonlinear—and indeed, nonmonotonic, a concept widely referred to as the Environmental Kuznets Curve (Grossman and Krueger, 1993). Changes in the economic structure occurring in the course of economic growth alter both the valuation of and demand for environmental assets, and if sectors differ in their propensity to pollute or to use depletable resources, it follows that emissions and/or depletion rates will also change, a phenomenon that has been termed the *composition effect*.² The net environmental impacts of structural change can either be harmful or benign; more importantly, perhaps, the aggregate composition effect has many components, each with its own specific set of underlying economic and institutional determinants. For land and forest issues, this analytical approach enables research to move beyond trivially true assertions that deforestation and upland land degradation are the consequences

¹ Although the paper rests on a broad claim regarding the generality of the conclusions, there is no attempt to provide a complete accounting for the linkages between economy and environment in the uplands. The specific circumstances of the study site lead to an emphasis on some aspects of development and environment rather than on others.

² The composition effect is one of three normally identified in analyses of growth-environment linkages. The other two are the *scale effect* (the additional demand on environment and natural resources due to economic expansion), and the *technique effect*, capturing secular changes in technology and nonhomothetic preferences, due to changes in the capital stock and changes in incomes, respectively. Unlike the composition effect, the signs of the scale and technique effects are hypothesized to be unambiguous: scale effects increase environmental damages, and technique effects lessen them. See Antweiler et al. (2001).

of population pressure and "market forces." One thing that quickly becomes clear is that while *total* population growth in a country may justifiably be regarded as exogenous, its spatial distribution, and the incentives that upland populations have when making resource use decisions, are heavily conditioned by government policies, both those directly targeting such populations and activities, and also those operating at the broadest level of the economy.³

The economies of Asia's uplands differ both in structure and level of development from lowland zones. They are less densely peopled and more dependent on agriculture and other resource-based industries, their populations are poorer, less healthy, and less well educated, and market access is constrained by higher transport and transactions costs. The population living on "fragile" lands in Asia and the Pacific is currently estimated at 469 million, or 25% of total population (World Bank, 2003).⁴

As recently as a generation ago, upland populations were isolated from lowland and nonfarm economies by infrastructural constraints, travel costs, and even ethnic and political divisions. However, upland population trends, markets, policies, and institutions are now strongly influenced by the development of the overall economy. Roads and telecommunications integrate upland markets with the national economy. As markets expand they create new economic opportunities, which upland and migrant populations are generally quick to seize. In so doing, they also alter the value of immovable resources such as forests and land. In a subsistence economy, such resources (and even labor) have values derived only from the requirements of the local economy, but market integration requires that resource valuations reflect returns obtainable in new uses.

Development policies have direct effects on Southeast Asian uplands largely through infrastructure provision. The impact of road construction is huge, since it reduces transport costs and accelerates flows of migrants and information. As elsewhere in the developing world, road construction has a strong association with

deforestation and the spread and intensification of agriculture (Cropper et al., 1997; Andersen et al., 2002).

The expansion of roads and markets, however, also conveys the *indirect* effects of policy distortions to upland resource use decisions, so economic and policy trends in industry and lowland agriculture become central to upland development (Coxhead and Jayasuriya, 2003a), and national trends in food demand, agricultural technology, and food policy can all have significant environmental consequences. Most obviously, agricultural support policies stimulate the expansion of cultivated area at the expense of the forest. The mechanisms vary from country to country and over time, with contributions from state-sponsored land clearing for settlement programs, commercial forestry, and subsequent land conversion by corporate agribusiness enterprises, and deforestation and land clearing (as well as the intensification of bush fallow rotation systems) by "subsistence" farmers (Angelsen, 1995). All land colonization, however, is driven by a combination of opportunity and necessity, and encouraged by the absence of well-defined and effectively enforced property rights over forest-covered land. The property rights problem itself is partly an artifact of government policies that identify forest-covered land (or land so designated, including cleared land above a certain slope or altitude) as a public resource, neither alienable nor disposable, without providing adequately for its protection from encroachment.

3. The institutional context

Through markets and migration, policies directed at specific "lowland" sectors can also affect upland resource valuations, patterns of land use and production, and thus environmental outcomes (Coxhead and Jayasuriya, 2003a), but the effects are conditioned by the policy and institutional context of upland environmental management. This aspect is examined in this section, focusing on those institutions most critical to forests and agricultural land resources.

3.1. Property rights over land and forest

The centralization of control over natural resource assets has long been a feature of governance in developing countries. In the Philippines, Spanish-era land

³ See Binswanger (1991) for an early analysis of policy influences on deforestation in the Brazilian Amazon.

⁴ "Fragility" is defined by criteria relating to aridity, slope, forest cover, and soil type.

law asserted the state's ownership of all land unless a decree was issued to the contrary. This doctrine persisted through the American administration and independence; though the area of declared public land had shrunk to only 62% of the total by the mid-1980s, it still covered 90% of upland (Lynch, 1987). Moreover, a 1975 presidential decree explicitly prevented occupants of uplands from acquiring private property rights at the same time as it declared that existing occupants of public lands were immune from prosecution (Lynch, 1987, p. 284). This act, given the lack of documentation and difficulty of enforcement, effectively legislated open access to forestlands by individuals.

In Indonesia, Dutch colonial practice persisted in the Basic Forestry Law (1967), which designated 74% of the total area (90% of the Outer Islands) as "state forestland" under the control of the Ministry of Forestry, nullifying traditional law or *adat*. Other countries passed similar laws around this time.

Though the primary incentive for control over land and natural resources was its exploitation as an input to growth, motivation for continued central ownership and control was as much political as economic or managerial. Bromley (1991, p. 127) has observed that:

The new independent nation-states that arose following the Second World War have shown little interest in revitalizing local-level systems of authority. . . (they) do not relish the thought of local political forces that might challenge the legitimacy and authority of the national government. This means that natural resources have become the "property" of the national governments in acts of outright expropriation when viewed from the perspective of the residents of millions of villages. This expropriation is all the more damaging when national governments lack the rudiments of a natural resource management capability.

National planners regarded natural forests as resources to be exploited for national development. Exploitation of forests (and in trade, of comparative advantage in timber and forest products) was a means to finance modern agricultural and economic growth (e.g., ADB, 1969).⁵

⁵ As Andersen et al. (2002) argue, deforestation's profitability can be seen in the long term, if the land that is converted is devoted to sustainable agriculture to support food security in the urban centers.

3.2. Forest management

The question of who governed the forests during this period is more complex than the applicable laws indicate. While most forest resources were claimed by the state and governed at the national level, in reality these resources were controlled by a number of actors, with or without the blessing of the national government. Alliances and conflicts among different national agencies, the military, local elites, and domestic and foreign timber corporations often determined forest access. Nevertheless, in some cases local communities successfully maintained at least some degree of influence, usually due to difficulty of access. Examples include the highlands of Vietnam, Laos, and Thailand (Poffenberger, 2000). In the Philippines and Indonesia, on the other hand, the central government and private sector timber corporations have had more dominant power in the use of forest resources (Kummer, 1992), contributing to high rates of forest clearing.

Forest and land management has also been affected indirectly through other policies such as the various internal migration (or "transmigration") initiatives of the 1960s to the 1980s, in which government agencies cleared and developed virgin land at the frontier to house and sustain sponsored migrants. Under these programs large areas, most notably in Malaysia and Indonesia, were converted to plantations and upland fields, the latter sometimes supplied with irrigation at considerable expense, and with mixed results. The degree of control over land use exerted by government agencies in transmigration areas varied, however. Federal land development agencies in Malaysia, where the main focus was on the development of rubber and other plantation crops, sustained a relatively high degree of central control, whereas in Indonesia national agencies had little power (Gérard and Ruf, 2001).

Forest policies began to change in the late 1980s as commercially exploitable stocks dwindled, the damaging side effects of deforestation became more readily apparent, and domestic and foreign conservation movements gained voice. The policy approach, however, continued to rely largely on central control. Thailand and the Philippines both imposed bans on commercial logging and on the export of raw timber around 1990 (Indonesia had imposed a similar ban in 1981 to promote its plywood industry rather than to conserve timber resources). However, these bans were

difficult to implement in the absence of appropriate incentives for timber harvesters and exporters, and were widely circumvented. Efforts to provide incentives for sustainable forest management met with only limited success.⁶

3.3. *The shift to local ownership and management*

The evolution of forest policy away from centralized exploitation (and more recently, from centralized attempts at conservation) toward giving communities and their representatives a more central role is more recent. The recognition of ownership by upland communities is even more so, in spite of earlier legal steps in the same direction, and remains incomplete.

Decentralized control over resources, including community-based forest management (CBFM) programs, was widely adopted in most Southeast Asian countries only in the 1990s—usually coinciding with broader programs of political decentralization. Yet the shift has been incomplete, and the devolution of aspects of forest ownership and/or management has not provided a silver bullet to manage forest degradation and depletion. Policy conflicts, fueled both by economic pressures and mismatches between central and local powers, have continued. In Thailand, for example, religious movements have played an important role in the formation and expression of community opinions on environmental management, often bringing them into conflict with national government programs. In post-Suharto Indonesia, local administrations have frequently augmented *de jure* steps toward decentralized control taken in 1999 with *de facto* assertions, gambling that central authorities will not provide effective countermeasures.

The period of decentralization has seen governments commit to giving more power to communities to manage environmental resources, but the legal basis for

such actions is only weakly established. For instance, community involvement is encouraged in Cambodia, but the absence of documented forest rights and responsibilities leaves the community with no authority to protect local forests (Poffenberger, 2000). Similarly, Thailand has implemented a National Forest Policy but does not specify environmental rights and responsibilities for communities, and the legal basis for community resource management is still lacking. In Vietnam, the 1993 Land Law conferred use rights over agriculture and forestlands to communities and individuals, but ownership still rests with “the people”, i.e., the state (Tachibana et al., 2001).

The Philippines is arguably the regional leader in institutional strengthening for environmental management, especially since the passage of the 1991 Local Government Code. Implementation of the Integrated Social Forestry (ISF) Program (part of the Comprehensive Agrarian Reform Program [CARP] passed in 1987 and covering all agricultural lands, including public alienable and disposable lands) has also facilitated giving of tenure to forest occupants. Upland dwellers can secure a Certificate of Stewardship Contract (CSC) giving them exclusive use and occupancy rights to public forestlands for a period of 25 years. Individuals, families, and local communities enter into a contract with the government for this purpose, whereby it is the duty of the CSC holders to engage in the application of soil conservation, suppression of forest fires, and conservation of forest growth in their areas of responsibility (Magno, 2003). Several more seminal laws were passed in the 1990s to manage forest resources. Among these is the Indigenous People’s Rights Act (IPRA), passed in 1997, which purports to confer title to ancestral domain and land claims on indigenous communities. However, ambiguities in the provisions of this law persist, and its implementation has not been smooth.

In summary, policies that support community-based stewardship of natural resources are slowly evolving in Southeast Asia. Yet the structures that are emerging are quite different from earlier customary governance systems, not least in that there is collaboration between the state (national or local governments) and civil society. Incomplete decentralization of other areas of administrative control may have complicated the forest and land management process. In many cases, perhaps the majority, local control does not imply governance by

⁶ In the Philippines, a program called the Industrial Forestry Management Agreement (IFMA) was implemented in 1991. This was a 25-year renewable contract between the Department of Environment and Natural Resources (DENR) and private business or legal commercial forest users wherein the latter will manage part of the denuded forest by planting and having the right to harvest trees (Vitug, 2000). This was suspended in 1995 for political reasons. A similar program in Indonesia (Timber Plantation Development) was also promoted, but its sustainability objective is falling short of expectations (Resosudarmo, 2002).

the community; rather, there is an ongoing evolution of local power that mimics the centralized system it has replaced. Local elites, foreign interests, and other actors now also have access to resources—sometimes with less oversight than before. Whether decentralization is a better arrangement, therefore, is still to be determined.

4. Decentralization and environmental management

Decentralization undermines the traditional environmental management model based on regulatory constraints designed and implemented by central government agencies. After years of failed attempts at centralized control over the management of natural resources, opinion has now turned decisively in favor of local approaches. Can local governments do a better job of resource management than central governments? Some advantages are clear: local administrations can be expected to have specialized knowledge of environmental and economic conditions, and should therefore have the ability to fine-tune policy. But there are disadvantages as well.

Externalities. Jurisdictional boundaries do not typically coincide with relevant natural resource boundaries (such as watersheds), leading to problems of horizontally overlapping control areas and unresolved externalities. When the correspondence between the boundaries of political jurisdictions and the optimal units for natural resource management is inexact, environmental policy managers have an incentive to over-exploit the resource. In Southeast Asia this is most clearly visible in the management of watersheds and river basins, and is compounded when economic and population growth increase local demands on water and land resources. In Vietnam, for instance, conflicts have emerged between upstream coffee irrigators and downstream rice producers, and in China, development activities in upstream locations lead to social conflict with neighboring villages over pollution, erosion, and siltation in downstream locations (Dupar and Badenoch, 2002).

Accountability of local administrations is a critical constraint to socially beneficial local decision making. At the macro level, accountability requires institutional checks and balances on the actions of local

governments, private businesses, and even NGOs, and a strong external audit system is critical to ensuring accountability (Manasan et al., 1999). Local governments could be more fiscally responsible and accountable if they were given more taxing powers because they are closer to the constituents that they tax, but in countries like the Philippines a large portion of a typical local government's income is still controlled by central government. When local funds are limited, fiscal incentives exist for local governments to promote polluting industries and accelerate resource extraction (Rola et al., 2003). This has also been evident in Indonesia since the fall of the New Order regime (World Bank, 2000a).

At the micro level, accountability is determined by the availability of constitutional and practical instruments by which communities acquire a "voice" in the formation and implementation of local policy. While decentralization "does not guarantee that local communities will reap more benefits and be more interested in sustainable environmental management, it does increase the chances that this will happen" (Manasan, 2002). Participatory approaches to natural resource management, involving the community directly as well as the local government, improve the likelihood that local governments will be held accountable for resource management decisions.

Assignment of functions. A third and related problem arises from incomplete and uneven decentralization of functions. This often means that the mandate assigned to a local agency may not be matched by the authority vested in it and that policies applied by one agency may counter the effects of policies applied by others.⁷ One of the most common problems is inadequate coordination between line agencies and elected local authorities that have assumed the management of their environmental resources. In Philippines, Thailand, and Indonesia, decentralization laws have failed to provide a clear division of responsibilities between local government and line agencies, for example, by increasing budgetary transfers without allocating new expenditure responsibilities (World Bank, 2000a, 2000b). In countries like Vietnam and Laos, regulatory policies still preclude locally preferred options. Line agencies at the local level are still committed to national programs even if these are not consistent with local development

⁷ See Manasan (2002).

goals. Hence, one challenge of decentralization is to "embed efforts in a framework that promotes overall national goals of economic and administrative integration, environmental quality and revenue generation while allowing sufficient flexibility in local implementation to meet unique local conditions" (Dupar and Badenoch, 2002).

Capacity constraints. Finally, local governments face capacity constraints in the conduct of analysis, policy, and fiscal powers needed to implement some measures (Coxhead, 2002). Another perceived stumbling block of a decentralized system of environmental governance and management is the lack of capacity to do so at the local level. In most countries, environmental databases are weak, which undermines the ability of national and local policy makers to plan and prioritize projects (World Bank, 1995). Local officials, in addition, lack the technical capacity for policy design and implementation, and for monitoring and evaluation of environmental projects.

5. Decentralized resource management in a Philippine municipality

5.1. Study site

The study municipality, Lantapan in the province of Bukidnon, is located in the Southern Philippine island of Mindanao. It has a landscape that climbs from river flats (300–600 m above sea level) through a rolling middle section (600–1,100 m) to high-altitude, steeply sloped mountainsides (1,100–2,900 m). It hosts the headwaters of a major river (the Manupali) that runs into a dam that diverts flow into a network of canals comprising a 4,000-hectare irrigation system constructed by the Philippines' National Irrigation Authority in 1987. The entire system ultimately drains into the Pulangi River, one of the major waterways of Mindanao Island, about 50 kilometers upstream from the Pulangi IV hydroelectric power generation facility, one of the six largest in the country.

During the 1980s the population in the study area grew at an annual average of 4%, much higher than the Philippine average of 2.4%, mainly due to immigration. During the 1990s the rate declined to about the same level as the national average of 2.3%.

Agriculture continues to dominate the economy of the municipality and of the province, and more than

half of the land area is planted with annual crops. The lower footslopes produce corn and sugarcane, while corn is dominant in the upper footslopes that make up the largest area of the watershed. Coffee is an important secondary crop at middle altitudes, while at higher elevations corn is planted alongside both coffee and temperate-climate vegetables. Starting in 1998, at least ten commercial hog and poultry firms went into business; in 1999, two banana companies were established in both the upper and lower parts of the town. In the earlier times both logging and forest fires facilitated agricultural expansion. In recent decades, however, the profitability of commercial vegetable cultivation has been the primary impetus for forest encroachment, with decisive contributions from road development and the lack of well-defined and enforced property rights in land (Cairns, 1995). The expansion of vegetables and plantation crops in lieu of cereal crops in the area is also a result of favorable price and trade policies.

5.2. Environmental consequences of development

Commercial loggers opened Lantapan's forestland after being granted a Timber License Agreement (TLA) by the national government. Agriculture followed the loggers, with migrants from other parts of the Philippines contributing to the expansion in the cultivated area. Rapid deforestation took place from the 1950s to the 1990s. The uplands were seen as a source of "green gold" by lowlanders (Malanes, 2002), and the spread of intensive upland agriculture was largely driven by market opportunities (Coxhead et al., 2001). Fallow periods were short, and the absence of soil conservation measures resulted in significant land degradation. During 1974–1994, primary forest cover was reduced from half to less than one third of the municipal land area, being replaced mainly by corn and corn-based farming systems (Li, 1994). Resource management decisions were the responsibility of national agencies, although in practice land use rights were allocated through local and informal mechanisms. In-migrants (some relocated from Northern Luzon highland areas in government programs) acquired land from indigenous people in exchange for small sums or in barter trade (Paunlagui and Suminguit, 2001).

The data show that the rate of deforestation has decreased in the past decade and that, at about 0.6% annually during 1994–2001, it is less than half of the

national estimate of 1.4% per annum during same period. Out-migration has also been observed, especially although not exclusively during the drought years 1997–1998 (Rola et al., 1999). On the other hand, agricultural intensification continues, driven by opportunities in domestic and international markets. Land use data also confirm the spread of intensive cultivation of annual crops to the upper watershed. Water quality monitoring since 1994 in several watersheds shows that measures of total suspended solids (TSS) are considerably higher in those areas where agricultural cultivation is more widespread, in spite of lower average slope, and that seasonal TSS peaks appear to coincide with months of intensive land preparation activity (Deutsch et al., 2001).

Other consequences of rapid and increasing soil erosion rates as a result of agricultural intensification can be seen in the deterioration of the two water impoundment structures,⁸ the MANRIS diversion dam and the Pulangi IV hydro power installation on the Pulangi River, located a few kilometers below the junction of the Manupali. Although forest management policies and strategies to reduce deforestation were adopted in the 1990s, and, despite a ban on commercial logging, policies to promote sustainable upland management have yet to translate into better environmental health.

5.3. Policies and institutions in transition

Environmental management mandates and implementation of environmental programs/plans are distributed across all levels of governance in the Philippines and the still-evolving multilevel/multisectoral institutions, while funding and other administrative support are facilitated through Congress and the various local government levels. Technical support in the preparation of provincial and municipal plans, comes mostly from the Department of the Environment and Natural Resources (DENR), with some assistance from academics and other local government units (LGUs). The implementation of the plans and monitoring and evaluation are placed under the now evolving multilevel, multisectoral institutions.

⁸ See also Pingali (1997), for similar evidence from elsewhere in Asia.

5.3.1. The national level

Philippine law states that it is the duty of the national government to maintain ecological balance. The DENR is tasked to lead in this function, although its mandate naturally overlaps with that of the Department of Agriculture, the National Irrigation Administration, and several other bodies. Following the Earth Summit in 1992, the national government created the Philippine Council for Sustainable Development (PCSD).⁹ Local councils were also organized in the various regions of the country. The PCSD is mandated to oversee and monitor the implementation of the Philippine Agenda 21 (PA 21), the Philippines' blueprint for sustainable development, by providing the coordinating and monitoring mechanisms for its implementation.

The 1991 Local Government Code (LGC) initiated a period of devolution of national mandates, including some of the DENR. Currently, therefore, the system is in transition while national agencies are slowly devolving responsibilities to local governments, but the DENR remains the least decentralized of all Philippine government agencies, with only 4% of its staff and 9% of its budget located outside Manila, in contrast with averages of 51% and 12%, respectively, for all agencies (Manasan, 2002).

5.3.2. Subnational level

Much of the devolution in the LGC bypasses the provinces, moving power directly to the municipalities. In practice, however, provincial governors and their administrations retain considerable influence over local decision making through the exercise of their supervisory and coordination functions.

Bukidnon has two provincial offices for environment and natural resources. The national DENR exercises its line functions through the Provincial Environment and Natural Resources Office (PENRO), i.e., for forest protection and titling, while the local government maintains the Bukidnon Environment and Natural Resources Office (BENRO) and takes care of devolved functions, e.g., small-scale mining.¹⁰

⁹ This is headed by the Director General of the National Economic and Development Authority (NEDA) as chairperson, the Secretary of the DENR as the Vice-Chairperson, and with the membership coming from both government and NGOs.

¹⁰ There is also the city ENRO and the community-level ENRO (or CENRO). The latter's function is mainly focused on protected areas where these areas span two or more LGUs.

On the other hand, municipal government is mandated to undertake water and soil resource utilization and conservation projects, implement community-based forestry projects, manage and control commercial forests with an area not exceeding 50 square kilometers, and establish tree parks, green belts, and similar forest development projects. All these functions should be *pursuant to national policies and subject to supervision and review of the DENR* (DILG, 1991). Thus, the national office still controls the environmental programs of local governments. Further, low-income upland municipalities such as Lantapan do not usually have an environment and natural resources office, while all municipalities have a municipal agricultural office (MAO). As intensive agriculture has a direct impact on the state of environmental resources, it is worth considering that these functions be merged.

Furthermore, the village or *barangay* government has no legal mandate to conduct environmental programs, even though village governments are ideally positioned given their proximity to communities and households. In Lantapan, village-level environmental programs such as soil conservation, tree planting, monitoring the buffer zone, etc. are initiated by external organizations, especially nongovernmental organizations (NGOs), whose sustainability must be questioned.

5.3.3. Multilevel, multistakeholder institutions

Some institutions with an environmental mandate cut across the different layers of governance, and across different sectors. The rationale for this institutional innovation is to fully capture the benefits and costs in the process of managing the resource, and to be able to get as much representation from the different stakeholders.

5.3.3.1. The Protected Area Management Board (PAMB). In the Philippines, protected areas are governed by a management board whose membership consists of representatives from the various sectors and the different governance levels. Bukidnon hosts the Mount Kitanglad Range Natural Park, a protected area, managed by the PAMB. The chair of the Board is the regional director of the DENR.¹¹ The PAMB meets

regularly to provide oversight and guidance to field implementers.

The Council of Elders (COE) reinforces the natural park management by applying customary law in dealing with violators. The Kitanglad Guard Volunteers (KGV), a people's organization patrols and monitors illegal activities, with offenders undergoing a *sala* (a cleansing ritual), so as not to commit similar acts in the future. The involvement of the COE is also as stipulated in the Indigenous People's Rights Act (IPRA). In the IPRA, indigenous peoples (IPs) are by law now given the authority to practice their customary rules in the management of natural resources. It is, however, observed that local tribal leadership through this COE is "emerging and exerting influence to the management of the protected area beyond the terms of the legal prescriptions." Hence, "there is a need to clarify the management implications between legally instituted and tradition bound structures" (Mount Kitanglad Range Natural Park Management Plan, no date).¹²

5.3.3.2. Watershed Protection and Development Councils at the local level. Watershed Protection and Development Councils exist for both the province and the study municipality. At the provincial level, this is a multisectoral body composed of national and local agencies, academics, local government units, and representatives from NGOs. This provincial body was created "in order to fully protect and preserve the remaining forests in the Bukidnon Watersheds and rehabilitate open areas within their headwaters."¹³ Representatives of resource agencies in the province make up the membership of the Technical and Advisory Committee (TAC). This body has the potential to allow local actors and stakeholders the opportunity to realign their efforts toward wider watershed-level programs.

At the municipal level, the Watershed Management Council was formed in part as a response to advocacy efforts of the SANREM CRSP research project.

in Bukidnon, the provincial government is actively involved in its management.

¹² Department of Environment and Natural Resources (DENR) and Kitanglad Integrated NGO (KIN) 2000. Mount Kitanglad Range Natural Park Management Plan. Protected Area Superintendent Unit (PASu), Malaybalay, Bukidnon, Philippines.

¹³ This is contained in President Fidel V. Ramos' Presidential Memorandum Order (PMO), 270 dated March 1995 (Sumbalan, 2001).

¹¹ This is a generic rule as protected areas could be spread across more than one province. As the Mount Kitanglad range is contained

This is a multisectoral group comprising representatives from agribusiness, NGOs, peoples' organizations, the municipal legislative council, and provincial agencies. The Municipal Watershed Management Plan, just recently approved, will be used as a guide in watershed management in the various micro-watersheds in the municipality. It is an input into the provincial watershed management plan.¹⁴

The findings reveal, therefore, that policy and institutional initiatives are slowly evolving but are not yet sufficient to arrest the resource degradation brought about by agricultural intensification.

6. Toward a win-win scenario in the late development period

In the terms of the framework of analysis, Lantapan and many other Asian upland villages are in transition to the late period of institutional development. In this setting, two alternative pathways provide two extreme environmental outcomes. In the best possible world, institutions evolve to catch up with the pressures brought about by economic development. Alternatively, institution development lags so far behind economic development pressures that growth is compromised by pervasive and possibly severe environmental damages. The good news in Lantapan is that deforestation may have largely ceased, partly due to the inaccessibility of the remaining commercial forest stands and partly because of forest protection policies and institutions. Yet agricultural intensification, driven largely by the market, continues. Poorly defined property rights in land and the nonpoint nature of water pollution originating in soil erosion and chemical runoff mean that land degradation and water pollution continue to worsen in spite of institutional strengthening and devolution of responsibilities. Development of institutional and legal frameworks for land and watershed protection lags far behind development pressures. How can upland villages like Lantapan attain the best outcomes? The following are some recommendations:

1. *Better accountability requires genuine decentralization.* Genuine decentralization implies autonomy

¹⁴ In 2003, the province of Bukidnon was the grand prizewinner in the Philippines' *Clean and Green Contest* in recognition of, among others, its innovative watershed management plan. This contest is part of the environmental management incentive program of the Arroyo administration.

with respect to fiscal, administrative, and political powers. From the case study, increasing viability of village and community institutions, and increasing willingness of the provincial government to invest in environmental programs can be observed (Sumbalan, 2001). At the lowest levels of government (municipal or village levels), appreciation of the benefits of good environmental management is still lacking, and capacity building is needed if environmental indicators are to be properly monitored. National regulatory policies could be implemented at the very local level, once capacity is present. Thus, while national government plays an important role in orchestrating broader environmental policies, it should help build capacity at the provincial and municipal levels.

Governance must be transparent and responsible, and thus accountable. Broad-based participation by stakeholders can also increase accountability—a "voice" is important, and trust in the leaders and other community members can encourage active participation. The essence of social capital is important; increased social capital with its greater degree of horizontal connection is seen to improve governments and can lead to increased community cooperative action and solve "common property" problems (Narayan and Pritchett, 1997). In the case of Lantapan, it was shown that communities with strong social capital were more accountable to their members (Paunlagui et al., 2003).

The more important effect of genuine decentralization is the ability of local governments to deal with their neighbors in cases where resource management issues spill across jurisdictional boundaries and agency mandates. A strong local government can command collaboration among other LGUs and line agencies for environmental management.

2. *Addressing the externality problem requires watershed-based institutions and policies.* In spite of the intrinsic desirability of decentralization, careful attention must be paid to the appropriate assignment of functions to each level of governance. Given the externalities involved, there is a compelling case for the management of forest, land, and water resources at the watershed or river basin level (Dixon and Easter, 1986; Francisco, 2002). This means defining the hydrologic unit and providing for an administrative structure for this level of

management.¹⁵ Both the province of Bukidnon and the municipality of Lantapan have started structuring the watershed management bodies and preparing their watershed management plans accordingly. However, strong cooperation among villages and among local government units is needed, especially in terms of regulatory and fiscal functions. Most importantly, the watershed management plan should be properly funded. A seemingly weak or total lack of a watershed-level organizational structure is seen to be a factor in watershed degradation in the Philippine case and throughout the region.¹⁶

3. *Market-based mechanisms can support sustainable upland management, but only if the appropriate institutions are in place.* An important lesson from Lantapan is that market expansion is seldom the only cause of unsustainable development. Property rights failures, externalities, and incomplete markets are usually present, and their effect is to distort market-driven resource allocation and conservation decisions (Barbier, 1990; Pagiola et al., 2002). In this setting, first-best solutions require addressing the failures at source, and then designing policies for agricultural development. Uncontrolled market expansion without property rights or other corrective and regulatory institutions results in a "third phase" of development in which resource depletion and environmental destruction is rapid, pervasive, and potentially disastrous.¹⁷

Market-based incentives can also be used by local governments to encourage sustainable land use decisions. Subsidies can be offered to farmers who may be practicing soil conservation measures or planting perennials. The value of these can be equal to the "true" cost of soil erosion, i.e., including downstream effects. In reality, there is a tendency to overstate cost if subsidies are given (Goodstein, 1999); but the incentive-

compatible approach can encourage truthful behavior (Kwerel, 1977 as cited by Goodstein, 1999). These are areas for future research.

In the study municipality, one recently adopted municipal ordinance stipulates that if farmers practice soil conservation measures, they will be favored as participants in government programs. Tree farming and agroforestry, while promoted in Lantapan, may not be on a scale sufficient to arrest erosion problems. Nevertheless, recent studies underscore the importance of price policy intervention for tree-growing in promoting tree-based farming systems for small holders (Predo, 2002).

7. Conclusions

The findings of this research show that for the past decade, deforestation rates in the upland areas of Southeast Asia have been reduced, mainly due to state and communities working together. The sustainable management of upland villages like Lantapan can best be achieved if policies and institutions catch up with the pressures of economic development. Genuine decentralization involves transparency in the use of resources, responsible governance, and accountability.

Broad-based participation of stakeholders can flourish if social capital is strong. More innovative management structures for upland resources should include the lowlands and the broader economic environment; thus a watershed approach is considered ideal. Incentives for practicing sustainable agricultural land use practices such as soil conservation, and tree farming should be compatible with the benefits to be derived by society as a whole. In the long term, price, trade, and wage policies can be used as instruments in promoting sustainable upland resource management.

What lessons have been learned? In this later phase of economic development, people and social structures are the most important features for responsible environmental management. Markets, communities, and the state will need to work together and can do so only in an atmosphere of mutual trust. "Seeking sustainability" is difficult, as field experiences reveal, yet future research strategies should take on participation by actors at all levels, should aim to build capacity, understand institutions, and should aid in the environmental policy decision-making process.

¹⁵ This is a problem addressed in wealthy countries by the creation of single-purpose jurisdictions such as school, fire, and policy districts, which may be subsets of political jurisdictions or may overlap several such units.

¹⁶ Kerr (2002) provides examples of good watershed-based management, such as the popularly cited case of Sukhomajri, India, that other upland villages can learn from and emulate.

¹⁷ As illustrated by such catastrophes as the 1992 Ormoc mudslides in the central Philippines, where denuding of upland lands created the conditions for a monsoon-rain fueled landslide that wiped out an entire town.

References

- Andersen, L. E., C. W. J. Granger, E. J. Reis, D. Weinhold, and S. Wunder, *The Dynamics of Deforestation and Economic Growth in the Brazilian Amazon* (Cambridge University Press: Cambridge, UK, 2002).
- Angelsen, A., "Shifting Cultivation and 'Deforestation': A Study from Indonesia," *World Development* 23, no. 10 (1995), 1713–1729.
- Antweiler, W., B. R. Copeland, and M. Scott Taylor, "Is Free Trade Good for the Environment?" *American Economic Review* 91, no. 4 (2001), 877–908.
- Asian Development Bank, *Asian Agricultural Survey* (University of Tokyo Press and the University of Washington Press: Manila, 1969).
- Barbier, E. B., "The Farm-Level Economics of Soil Conservation: The Uplands of Java," *Land Economics* 66, no. 2 (1990), 199–211.
- Binswanger, H. P., "Brazilian Policies That Encourage Deforestation in the Amazon," *World Development* 19, no. 7 (July 1991), 821–829.
- Bromley, D. W., *Environment and Economy: Property Rights and Public Policy* (Basil Blackwell: Oxford, UK, and Cambridge, MA, 1991).
- Cairns, M., "Ancestral Domain and National Park Protection: Mutually Supportive Paradigms? A Case Study of the Mt. Kitanglad Range National Park, Bukidnon, Philippines," Paper presented at a workshop on Buffer Zone Management and Agroforestry, Central Mindanao University, Musuan, Philippines (August 1995), mimeo.
- Coxhead, I., "It Takes a Village to Raise a Pigovian Tax... or Does It Take More? Prospects for Devolved Watershed Management in Developing Countries," Paper presented at a conference on Sustaining Food Security and Managing Natural Resources in Southeast Asia: Challenges for the 21st Century, Chiangmai, Thailand (January 2002).
- Coxhead, I., and S. K. Jayasuriya, *The Open Economy and the Environment: Development, Trade and Resources in Asia* (Edward Elgar: Cheltenham, UK and Northampton, MA, 2003a).
- Coxhead, I., A. C. Rola, and K. Kim, "How Do National Markets and Price Policies Affect Land Use at the Forest Margin? Evidence from the Philippines," *Land Economics* 77, no. 2 (2001), 250–267.
- Cropper, M. C., C. Griffiths, and M. Mani, "Roads, Population Pressures and Deforestation in Thailand, 1976–1989," Policy Research Working Papers (World Bank: Washington, DC, 1997).
- Deutsch, W. D., A. L. Busby, J. L. Orprecio, J. P. Bago-Labis, and E. Y. Cequiña, "Community-Based Water Quality Monitoring: from Data Collection to Sustainable Management of Water Resources," in I. Coxhead and G. Buenavista, eds., *Seeking Sustainability: Challenges of Agricultural Development and Environmental Management in a Philippine Watershed* (PCARRD: Los Baños, Philippines, 2001), pp. 138–160.
- DILG, *Local Government Code of the Philippines* (Republic of The Philippines: Manila, 1991).
- Dixon, J. A., and K. W. Easter, "Integrated Watershed Management: An Approach to Resource Management," in K. W. Easter, J. A. Dixon and M. M. Hufschmidt, eds., *Watershed Resources Management* (Westview Press: Boulder, 1986).
- Dupar, M., and N. Badenoch, *Environment, Livelihoods, and Local Institutions: Decentralization in Mainland Southeast Asia* (World Resources Institute: Washington, DC, 2002).
- FAO (Food and Agriculture Organization of the United Nations), *Global Forest Resources Assessment 2000* (FAO: Rome, 2001). Accessed at: http://www.fao.org/forestry/fo/fra/main/pdf/main_report.zip, November 2001.
- Francisco, H. A., "Why Watershed-Based Water Management Makes Sense," PIDS Policy Notes 2002-09. Philippine Institute for Development Studies, Makati, Manila, Philippines (2002).
- Gérard, F., and F. Ruf, eds., *Agriculture in Crisis: People, Commodities and Natural Resources in Indonesia, 1996–2000* (CIRAD: Montpellier, France and Curzon: Richmond, UK, 2001).
- Goodstein, E. S., *Economics and the Environment* (Prentice Hall: Upper Saddle River, NJ, 1999).
- Grossman, G., and A. B. Krueger, "The Environmental Impacts of a North American Free Trade Agreement," in P. Garber, ed., *The U.S.-Mexico Free Trade Agreement* (MIT Press: Cambridge, MA, 1993), pp. 13–56.
- Kerr, J., "Sharing the Benefits of Watershed Management in Sukhomajri, India," in S. Pagiola, J. Bishop, and N. Landell-Mills, eds., *Selling Forest Environmental Services: Market Based Mechanisms for Conservation and Development* (Earthscan Publications: Sterling, VA, 2002).
- Kummer, D., *Deforestation in the Philippines* (Ateneo de Manila Press: Manila, 1992).
- Kwerel, E., "To Tell the Truth: Imperfect Information and Optimal Pollution Control," *Review of Economic Studies* 44, no. 3 (1977), 595–601.
- Li B., "The Impact Assessment of Land Use Changes in the Watershed Area Using Remote Sensing and GIS: A Case Study of the Manupali Watershed, the Philippines," Unpublished Masters' Thesis (Asian Institute of Technology: Bangkok, 1994).
- Lynch, O. J., "Philippine Law and Upland Tenure," in S. Fujisaka, P. Sajise and R. del Castillo, eds., *Man, Agriculture and the Tropical Forest: Change and Development in the Upland Philippines* (Winrock International: Bangkok, 1987), pp. 269–292.
- Magno, F. A., "Forest Devolution and Social Capital State-Civil Society Relations in the Philippines," in A. P. Contreras, ed., *Creating Space for Local Forest Management in the Philippines* (CIFOR and La Salle Institute of Governance: Manila, 2003).
- Malanes, M., *Power from the Mountains: Indigenous Knowledge Systems and Practices in Ancestral Domain Management—The Experience of the Kankanaey-Bago People in Bakun, Benguet Province, Philippines* (ILO, 2002).
- Manasan, R., "Devolution of Environmental and Natural Resources Management in the Philippines: Analytical and Policy Issues," *Philippine Journal of Development*, Number 53, XXIX, no. 1 (2002), 33–54.
- Manasan, R. G., E. T. Gonzalez, and R. B. Gaffud, "Indicators of Good Governance: Developing an Index of Governance Quality at the LGU Level," *Journal of Philippine Development*, Number 48, XXVI, no. 2 (1999), 149–212.
- Narayan, D., and L. Pritchett, "Cents and Sociability: Household Income and Social Capital in Rural Tanzania," Policy Working Paper 1796 (The World Bank: Washington, DC, 1997).

- Pagiola, S., N. Landell-Mills, and J. Bishop, "Making Market Based Mechanisms Work for Forests and People," in S. Pagiola, J. Bishop and N. Landell-Mills, eds., *Selling Forest Environmental Services: Market Based Mechanisms for Conservation and Development* (Earthscan Publications: Sterling, VA, 2002).
- Paunlagui, M. M., M. R. Nguyen, and A. C. Rola, "Social Capital, Ecogovernance and Natural Resource Management: A Case Study in Bukidnon, Philippines," ISPPS Working Paper No. 03-04, University of the Philippines, Los Banos College, Laguna, Philippines (2003).
- Paunlagui, M. M., and V. Suminguit, "Demographic Development in Lantapan," in I. Coxhead and G. Buenavista, eds., *Seeking Sustainability: Challenges of Agricultural Development and Environmental Management in a Philippine Watershed* (PCARRD: Los Baños, Philippines, 2001), pp. 138-160.
- Perrings, C., "An Optimal Path to Extinction? Poverty and Resource Degradation in an Open Agrarian Economy," *Journal of Development Economics* 30 (1987), 1-24.
- Pingali, P. L., "Agriculture-Environment Interactions in the Southeast Asian Humid Tropics," in S. Vosti and T. Reardon, eds., *Sustainability, Growth and Poverty Alleviation: A Policy and Agroecological Perspective* (Johns Hopkins University Press for the International Food Policy Research Institute: Baltimore, 1997).
- Poffenberger, M., "The Evolution of Forest Management Systems in Southeast Asia," in M. Poffenberger, ed., *Keepers of the Forest. Land Management Alternatives in Southeast Asia* (Ateneo de Manila University Press: Quezon City, 1990).
- Poffenberger, M., ed., *Communities and Forest Management in Southeast Asia: A Regional Profile of the Working Group on Community Involvement in Forest Management* (IUCN: Geneva, 2000).
- Predo, C., "Bioeconomic Modeling of Alternative Land Uses for Grassland Area and Farmers' Tree-growing Decisions in Misamis Oriental, Philippines," Unpublished Ph.D. dissertation, University of the Philippines Los Banos College, Laguna, Philippines (2002).
- Resosudarmo, I. A. P., "Timber Management and Related Policies," in P. Colfer, J. Carol, and I. A. P. Resosudarmo, eds., *Which Way Forward? People, Forests, and Policy Making in Indonesia* (Resources for the Future, CIFOR, and Institute of Southeast Asian Studies: Singapore, 2002).
- Rola, A. C., D. D. Elazegui, C. A. Foronda, and A. R. Chupungco, "The Hidden Costs of Bananas: Imperatives for Regulatory Action by Local Governments," CPAf Policy Brief. No. 03-01. College of Public Affairs, UPLB College, Laguna, Philippines (2003).
- Rola, A. C., C. O. Tabien, and I. B. Bagares, "Coping with El Nino, 1998: An Investigation in the Upland Community of Lantapan, Bukidnon," ISPPS Working Paper 99-03. UPLB College, Laguna (1999).
- Sumbalan, A. T., "The Bukidnon Experience*on Natural Resource Management Decentralization," Paper presented at the SANREM conference, ACCEED Makati (May 2001).
- Tachibana, T., T. M. Nguyen, and K. Otsuka, "Management of State Land and Privatization in Vietnam," in K. Otsuka and F. Place, eds., *Land Tenure and Natural Resource Management: A Comparative Study of Agrarian Communities in Asia and Africa* (Johns Hopkins University Press for IFPRI: Washington, DC, 2001), pp. 234-272.
- Vitug, M. D., "Forest Policy and National Politics," in Peter Utting, ed., *Forest Policy and Politics in the Philippines: The Dynamics of Participatory Conservation* (Ateneo de Manila University Press: Quezon City, 2000).
- World Bank, *Mainstreaming the Environment*. A summary, (Washington, DC, 1995).
- World Bank, *Indonesia: Public Spending in a Time of Change* (2000a). Accessed at <http://lnweb18.worldbank.org/eap/eap.nsf>, August 2003.
- World Bank, *Thailand: Public Finance in Transition* (2000b). Accessed at <http://www.worldbank.or.th/economic/index.html>, August 2003.
- World Bank, *World Development Report 2003* (Oxford University Press for the World Bank: Washington, DC, 2003).