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The Value of Thailand's Forests

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Thailand is a resource rich country, endowed with a wealth of natural resources and a varied topography and climate. These natural assets have been exploited in Thailand, as they have been in most countries fortunate enough to face such an option, in efforts toward economic development. The result is a trade-off between environmental and economic priorities. Judging from Thailand's exceptional gross domestic product (GDP) growth and economic progress, it seems that the country's chosen balance of exploiting natural wealth for economic gain is sound. Unfortunately, it isn't quite that simple.

Environmental costs are not fully reflected in conventional economic growth indicators.[1] Economic statistics focus exclusively on market transactions. As a result, wherever the market fails to reflect the full social value of a resource, economic indices will do so as well. (Social value is the value of a product or service to society, while market value reflects payments made by firms or individuals in formal markets.) Distortions often occur between social values and market value. In the case of natural resource exploitation these distortions arise primarily from externalities, costs to society which are not paid by those who create them. For example, if a logging company cleared a forest which had provided soil retention for downstream farms, erosion and siltation costs would be borne by the farmers, not the loggers. Logging would therefore prove economically productive in a market sense, by increasing loggers' income, but in the larger social context the costs of the activity might well outweigh the benefits.

A second important factor is the issue of time. The economic effects of ecologically unsound policies are generally lagged and cumulative in nature. After a long period of exploitation and degradation, which may appear extremely economically successful, thresholds will be reached at which the environment's assimilative capacity or a resource's regenerative capacity will finally be exceeded. Yet the economic statistics used by policy makers will have provided no warning of eminent decline.

If Thailand's resources are being undervalued and over-exploited, a real decline in the country's wealth will take place without being fully reflected in official economic statistics, and the country's long term economic strength will appear more robust than, in fact, it is. As long as economic indicators such as the GDP do not adequately reflect environmental and natural resource costs, the long term ecological viability of economic policies cannot be assumed by simply referring to current economic success.

For these reasons, the role of natural resources and the environment in economic development must be carefully examined, both qualitatively and quantitatively. This paper examines the role of forests in Thailand's development.

NATURAL ENDOWMENTS

Thailand covers a land mass of 513,115 square kilometers, divided into four regions: the northern mountainous region, the northeastern high plateau, the central alluvial plain, and the southern peninsula. Located in a tropical monsoon region of Southeast Asia between the Andaman Sea and the Gulf of Thailand, the country is subject to three distinct seasons. In the cool season, from November to February, the prevailing northeastern winds bring dryness and cold temperatures from mainland China. May to October is the rainy season, when the southwestern Indian Ocean monsoons bring rain and humidity. Occasional typhoons and depressions originating in the South China Sea also contribute to the rainy season weather pattern, often causing serious flooding. The third season, March to April, is extremely dry and hot.

This climate is host to a heterogeneous mix of forest types which can be broadly divided into evergreen and deciduous forests. Evergreen forests, accounting for slightly less than half of the total forest area, are generally found in the zones with the greatest amount of rainfall, the coastal and peninsular areas and river valleys. Tropical rain forest is the predominant type of evergreen forest in the country, and is concentrated in the wettest areas. Deciduous forests occupy the drier areas found farther inland or on steeply sloped mountains. There are over 150 commercially valuable tree species in Thailand.

FOREST POLICY

All forest lands and forest resources in Thailand are considered property of the state. In the nineteenth century, the Early Bangkok period, forests were held by the feudal lords, who, in cooperation with foreign logging companies, over-exploited the teak forests. Various regulations were enacted by the government, for example, the requirement that western logging companies replant four teak seedlings for every tree cut. These ambitious and far sighted policies understandably were difficult to enforce. Estimates suggest a rate of teak harvest that was three and a half times the rate of a sustainable yield in 1895.[2] To protect and manage the forests, the Royal Forestry Department (RFD) was established in 1896, and by 1899 the government had full ownership and control of all forest lands.

The country's seven National Economic and Social Development Plans (1961-96), have all set targets for the proportion of the country which is to remain under forest cover—proposing reforestation, conservation, and tree plantations to achieve these aims.

In the First Plan, a 50 percent forest cover target was set for Thailand's total land area. The Fourth Plan revised the target to a more realistic 37 percent. Yet forest cover fell to 29.4 percent by 1985, at which time the National Forest Policy was approved by the Cabinet. A central goal of the policy was to increase forest cover from the actual 29 percent to a new target of 40 percent, specifying that 15 percent of the country's land area be set aside for forest conservation, while 25 percent was to be designated for productive forest uses. Tree planting programs were to focus on fast growing commercial species and community forestry projects. The recently launched Seventh Plan (1991-96) increased its target for conserved forest area from 15 to 25 percent of the total land area in the country. This designation as conserved forest will allow application of the country's strictest controls to these areas.

Logging methods for concessions in productive forest areas have also been legislated. Selective cutting was the standard, and legally required, method of logging until 1985. The Fifth Plan (1982-86) called for a shift from selective cutting to clear cutting in forest timber concessions, with the recommendation that replanting of logged areas take place immediately. This shift in cutting practice was based on the belief that clear cutting was more appropriate to prevailing socioeconomic conditions, that natural forest regeneration has generally been inadequate, and that clear cutting requires less total forest area. At the end of the Fifth Plan in 1985 the system of clear cutting became law in the National Forest Policy. Currently, commercial logging is banned in Thailand. A Ministerial Decree terminated all forest logging concessions in January 1989 following the disastrous floods and mud slides of late 1988. The severity of the slides was believed to be a consequence of soil erosion resulting from deforestation.

Forest Area

Despite Thailand's long history of forest management, deforestation remains a serious problem. At the beginning of the twentieth century over 75 percent of Thailand was covered in forest. By the time of the First Plan, 53 percent of the country had forest cover. Since then, the forest has shrunk at an annual average rate of roughly 2.5 percent, with higher rates in the decade of the 1970s. Calculations derived from LANDSAT images in 1989 showed that only 27.95 percent of the country's total land area was covered by forest (Figure 1). In the past thirty years, over 130,000 square kilometers have been lost. A forest area roughly equivalent to this loss, 143,417 square kilometers,[3] remained in 1989.

Causes of deforestation include logging, encroachment for agricultural purposes, and urban and infrastructure development. In Thailand the predominant pattern of deforestation appears to have been

one in which commercial logging ventures first enter and create access into the forests, quickly followed by agricultural cultivation which prohibits regeneration of the natural forest. Reforestation has been an important function of the RFD. The RFD has also provided support for private and community tree planting programs. Yet the sum of all of these efforts reforested 6,968.94 square kilometers by 1989, roughly 5 percent of the area deforested since 1961 (Figure 2).

One of the issues which complicates reforestation is land tenancy and ownership. Denuded forest areas that are deemed appropriate for replanting are very often inhabited by farmers. It is estimated that 22 percent of Thai villages are located in national forest reserves, with some 8 million people living and farming there.[4] Thus, when replanting takes place farmers are displaced. To address this issue and safeguard the rights of the forest dwellers, the government is currently piloting a number of land titling and usufruct rights programs. It is hoped that land titling will encourage the adoption of sustainable agricultural practices and land improvement programs. However, whether reforestation rights are purchased from the inhabitants or leased from the government, the result tends to be that the displaced farmers encroach farther into the remaining forest for farm land.

Forests and Economics

Thailand's disappearing forests suggest a significant decline in natural wealth, yet economic statistics show remarkable and consistent growth. The country has followed an enviable development path from subsistence agriculture, to commercial agriculture, toward a complex industrializing economy based on industry and services. In the 1980s alone, the share of agriculture in GDP dropped from over 23 percent to roughly 15 percent. The share of the labor force employed in agriculture remains substantial, however, at over 60 percent. As a result, while Thailand's GDP per capita in 1988 was over 27,000 baht, more than 75 percent of those in agriculture earned 9,000 baht or less.

This shift toward the production of goods and services and away from agriculture will continue. During the Seventh Plan, industry is projected to grow at an annual average rate of 9.5 percent, while agriculture will grow significantly more slowly at only 3.4 percent, for an overall economic growth rate expected at 8.2 percent. By the year 1996 the workforce is expected to comprise 58 percent agricultural workers, with the remaining 42 percent in non-agriculture sectors.

Forestry represents a small and declining portion of the Thai economy. Commercially marketed forest products include timber, wood products, fuelwood and charcoal, rattan, bamboo, and wood tars. Yet in 1990 forestry accounted for only 0.5 percent of total GDP. The fact is that forest products have not played a large, direct, income generating role in Thailand.

Unfortunately for the forests, the services they provide to society are generally not quantified in monetary terms. Nonetheless they are quite valuable. As long as these services remain unvalued, forests can disappear without apparent harm to the economy, although the loss of these services clearly affects the welfare of the population.

In some cases, services are not valued in the economy simply because they do not enter formal markets. It is assumed, for example, that large quantities of food and fuelwood are collected from forests for individual use or sale in non-formal markets. The apparent consumption[5] of fuelwood and charcoal in 1989 was roughly 848,000 cubic meters. Estimates[6] of actual use in Thailand, however, range from 35.6 to 64.1 million cubic meters per year. Assuming the more conservative estimate, this suggests that well over 34 million cubic meters of fuelwood and charcoal were produced and consumed outside the formal market. This represents a value of over US$450 million[7] worth of forest production which is not recorded in national income, a figure greater than the total recorded contribution to GDP from all forestry-related production. Should this sizable non-formal production of fuel be stopped due to forest depletion, it would represent a real hardship to the poor, rural populations who depend on the forests. Yet there would be no indication of this loss in the economic statistics. In fact, the national income would increase because those who previously collected fuelwood would then need to purchase fuel in formal markets, contributing to the

growth of the market economy.

In some instances forest services remain unvalued because there is no simple market proxy to price them. Forests provide a habitat for both wildlife and vegetation which embody a wealth of genetic diversity, and potential medicinal and nutritional values that are as yet unmeasured. They also provide various recreational services. In Thailand there are 52 National Parks, 57 Forest Parks, as well as numerous wildlife sanctuaries, botanical gardens and arboretums. The majority of these parks are open and accessible for recreation, many even contain luxurious amenities, and they are used widely by the Thai public.

On a global level, forests represent 'carbon sinks.' Forest vegetation absorbs carbon, thereby reducing atmospheric carbon dioxide which is believed to contribute to global warming. In addition, it is believed that forest cover influences heat exchange at the earth's surface, leading to increased rainfall.[8] Despite the obvious value of these services to society, they have no accepted or recorded economic value.

A final example of the difficulty in valuing the services of Thailand's forests, is the relationship of forests to agriculture. It would appear that clearing forests for cultivation is highly profitable. This, however, is only true in moderation. Forests act to stabilize soil, which in turn limits erosion, siltation and flooding. As forests are cleared there will come a point at which the losses associated with soil instability wilt outweigh the gains provided by the extension of agricultural area. A study by Panayotou and Parasuk found that while converting forest lands for cultivation produced a net social benefit in terms of agricultural production during the 1960s and 1970s, the cumulative effects of deforestation now lead to a net agricultural loss when additional areas are cleared for cultivation. Surprisingly, reforestation should now lead to an increase in agricultural productivity. Diamant estimated that for Thailand in 1987, the direct cost of soil depletion resulting from swidden agriculture on forested land was US$50 million.

CONCLUSIONS

The forests are natural and social assets that are extremely complicated to value, but too valuable to ignore. The services provided by forests are complex and often subjective in their nature, they accrue to too many parties over too many time periods to be easily summed up in a 'back of the envelope' monetary calculation. There is some objection to the very concept of attaching a monetary value to nature. Yet, as long as no clear value is assigned to what society loses when forests are cleared, economic incentives will lead to over-exploitation.

It is likely that forest conservation and reforestation will not directly benefit Thailand's apparent economic strength. Yet it is fairly clear that further destruction will hurt the economy, most visibly through agricultural losses resulting from soil erosion. Less visible, but equally significant, would be the loss in unrecorded income derived from the forest. In a larger context, the loss of Thailand's forests may effect global biodiversity and climatic conditions.

While the true value of Thailand's forests may be impossible to quantify, it is clear that questions concerning forests, natural resources, and environmental management, cannot be dismissed by pointing to economic success.

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