

Greener Growth: Thailand's Road To Sustainable Development*

Chartchai Parasuk

This paper discusses basic issues concerning the close relationship between development and the environment. The discussion will compare the Thai and Japanese economies.

Thailand now stands at an important turning point in its history and the right balance between growth and environmental quality must be found. Thailand is still in need of further economic development. Rural and urban poverty must be eradicated and the standard of living of our citizens must be raised. This could gradually be achieved through a higher degree of industrialization. Yet the country also needs, unarguably, to rehabilitate its depleted natural resources and restore lost environmental quality. The question is how to marry these seemingly conflicting objectives? Many answers could be given, but few would dispute that greener growth is essential.

The Environment Is Economically Important. Our environment is already an important economic issue and will become more so in the coming twenty-first century. Depleted resources and a degraded environment have direct effects on the sustainability of any economy, not to mention the quality of human life itself. Unwise use of natural resources, among other ill effects, reduces income potential. Uncontrolled pollution translates into expensive clean-up costs and growing health risks. Environment even plays a part in international trade. The current yellow-fin tuna embargo by the United States, for instance, and requirements to identify the sources of timber used in furniture exported to some European countries are clear examples. Our environment and its health is certain to become more vital to our future international trade. No country can today afford to ignore environmental issues.

Issues for Policy Planners. To what extent should the environment be protected and to what extent should economic growth be forsaken? There is an unavoidable dilemma in choosing between development and environment. Both are costly. Which should have priority? And to what extent?

Theoretically it can be argued that development and environmental protection are incompatible. Ignoring the environment jeopardizes long-term economic growth. In the short term, however, environmental protection is likely to slow down the economy. Structural adjustments are needed before an economy can compensate for the added costs of environmental protection with new technology and better economic management. What, therefore, should be done? How should these forces be balanced, particularly in a country in the early stages of industrial development? This point will be addressed in detail in this paper.

DEVELOPMENT AND PROTECTING THE ENVIRONMENT: A DILEMMA?

Theoretical Concept

Environmental Protection As An Added Cost. Theoretically the environment should be considered as a factor in national production. The "public goods" character of the environment, plus the failure of the market to price the environment, however, leave this productive input unrecognized. If industry is freely permitted to emit pollution into the atmosphere, for instance, preserving air quality will certainly not be counted as a cost of production. Once air-pollution control measures are established, however, gaseous emissions are considered part of the national production cost. Environmental regulations thus impose additional costs on producers. Consider this textbook definition:

Output = $f(\text{Land, Labor, Capital, Technology; Environment})$

Before the age of environmental awareness, manufacturers paid only rent, wages, interest rates and, perhaps, technology fees. The environment was considered a "free" good or "public good." But if environmental regulations are enforced, manufacturers will have to consider the environment an additional production factor. Pollution prevention and clean-up costs must now be added. Examples of these new expenses include wastewater treatment facilities, air pollution scrubbers, and hazardous waste treatment fees. Production costs will, therefore, certainly become higher. Rises in production costs, however, could be compensated for by the adoption of *cheaper* and *greener* technology.

The Opportunity Costs of Protecting the Environment Can Be High. Developing countries are now facing pressure-both internal and external-to conserve natural resources and reduce pollution emissions. Environmental protection can harm the development potential of an economy for at least three reasons:

Lower Capital Accumulation. In the early stages of development, most countries derive their income from exploiting their natural resources, such as forests and minerals. Forests, for example, are cleared for valuable timber and wooded land is converted into farmland. The income generated from logging and agriculture is then used to finance development. If forests are not allowed to be cleared, then insufficient capital may be available for development;

Lessen the Competitive Edge on the International Market. If industries in the developing countries must follow environmental guidelines, their production costs will be higher than for countries with more sophisticated technology or with less stringent environmental laws. Prices of products from developing countries would, therefore, be higher and uncompetitive on the international market;

Reduce Investment Opportunities. Insufficient domestic savings force developing countries to depend on foreign investment as the principal source of funds for development. Strict environmental regulations may well make investment opportunities considerably less attractive. Foreign investors may look elsewhere to invest their money. For all developing nations, this is a serious problem.

With lower capital accumulation, less foreign exchange reserves, and insufficient foreign investment, it is difficult for developing economies to "take-off." Without economic expansion, inadequate financial resources will be available for improving infrastructure, education, and public health care-key ingredients for true development. The timing of the take-off period is also critical. If the economy does not take-off fast enough, population pressure will overpower economic development and the country may well fall into a vicious cycle of widening poverty.

Environmental Protection Is Still Essential to Sustainable Development. The above does *not* imply that developing countries should needlessly go ahead with the exploitation of natural resources and the degradation of the environment. Over-exploitation of natural resources and over-degradation of the environment will unquestionably endanger the long-term health of the economy. Wise and balanced environmental protection is clearly called for.

Balancing Development and Environmental Protection. The question is how, when, and to what extent, development should be balanced with environmental protection? There is no fixed answer. Each country must find its own answer. In general, if resources are abundant and the environment is clean, it may be acceptable to exploit resources and pollute the environment to at least some degree. But income thus generated must be wisely used to finance development, so that the country does not become dependent on outside resources and protects its ability to restore the environment later on.

THE EFFECTS OF DEVELOPMENT ON THE ENVIRONMENT: THE CASE OF THAILAND

A Phase of Rapid Development. In the last two decades, Thailand has been transformed from a predominantly agrarian to an industrialized economy. In 1970, the agricultural sector generated 27 percent of Gross Domestic Product (GDP). This sector's share of the economic pie has now plummeted to 14

percent (Figure 1). Agriculture has been eclipsed by the country's rapidly expanding industrial sector. The number of factories in Thailand has increased from 600 in 1970 to over 50,000 today. With industrialization, Thailand has become active in international markets. In 1990, the country earned US\$23 billion from exports, equivalent to 29 percent of that year's GDP. Three-quarters of export earnings come from manufactured goods. This rapid growth has quadrupled GDP. Real per capita income has tripled over the past two decades.

Development at a Cost. Economic growth does not come without cost. The expansion of Thailand's agricultural sector in the 1960s and 1970s caused severe deforestation (Figure 2). In the past thirty years, about 15 million hectares of forestland, or half of the country's original natural forests, have been converted to farmland. This has resulted in soil erosion, irregular water flows, drought, and flash floods. Industrial development has also rapidly polluted the environment. The country's carbon dioxide emission levels, for example, increased five-fold in just 20 years (Figure 3). In 1990, 75 million tons of carbon dioxide were released into our atmosphere, one million tons of BOD (biochemical oxygen demand) was discharged into our waterways, and 2 million tons of refuse were dumped into our landfills.

Moving Toward Environmental Protection. Thailand is now under strong pressure, both from within the country and from outside, to rehabilitate its degraded resources and to restore the quality of the environment. The country's Seventh National Economic and Social Development Plan (1991-1996) calls for a better balance between economic growth and environmental quality. Apart from imposing stringent environmental regulations and providing more investments to environmental abatement projects, the Plan has adopted the "**Polluters Pay Principle.**" Polluters, particularly manufacturers, now have to bear the cost of environmental protection and clean-ups.

Is the Cost Too High? Can Thailand really afford to protect its environment? Investments in pollution abatement and clean-up activities are very costly. The forthcoming wastewater treatment plant for the Bangkok Metropolitan Area alone will cost the tax-payers US\$800 million. Yet this expensive facility will be capable of treating only one-quarter of the total residential wastewater in the Bangkok area. Other environmental abatement projects also require substantial investment. Where will the financial resources come from? Moreover, US\$800 million spent on a single project means US\$800 million less is available for other urgent development needs-education, infrastructure, and public health-care. Apart from the financial burden, environmental protection poses other serious economic problems. First, stringent environmental regulations could drive away much-needed foreign investment. Given the Thai economy's resource gap-currently about 8.5 percent of the GDP-foreign investment is essential. It is evident that the double-digit growth rates of 1988 to 1990 were primarily financed by an influx of foreign capital. Second, adoption of the **Polluters Pay Principle** could widen this gap and levy sizable costs on our industries. Dependent as it is on exports of manufactured goods, is environmental protection a viable choice for Thailand?

LEARNING FROM JAPAN

Experience from the Developed Countries. Thailand is certainly neither the first nor the only country to encounter such a difficult decision in choosing between development and protecting the environment. All developed economies have passed through a stage of rapid economic growth, coupled with deteriorating resources and environment. The difference is that back then environmental concerns were not a strong public issue, at either local or global levels. Governments then suffered little or no pressure about the environment. Development plans could, therefore, focus solely on maximizing economic growth. Because of a lack of incentive to protect the environment, a "Pollute First and Clean Up Later" tactic was inevitable. Japan is an example of this approach.

Focusing on Economic Growth. Japan's economic success has indeed been remarkable. Reconstruction of the Japanese economy began after World War II. Economic expansion was speeded when Japan adopted the Income-Doubling Policy of the 1960s. The Policy accelerated industrialization. Average real GDP growth rates in the 1960s, 1970s and 1980s reached 11.27 percent, 4.88 percent, and 4.18 percent respectively. Within a single decade, 1961-1970, the Japanese GDP increased 2.4-fold, while per capita income increased 2.2-fold. Industrialization has also boosted the country's international position. The value

of exports increased from 2,000 billion yen in 1960 to over 60,000 billion yen in the early 1990s.

The Price of Success. Success does not come cheaply. Japan's adoption of the Income-Doubling Policy in the 1960s, though resulting in rapid economic expansion, was achieved at the expense of the environment. Environmental problems, in fact, became so severe that the Japanese parliament (Diet) passed laws to slow pollution in the early 1970s. It was feared, however, that these laws might jeopardize economic health. That did not happen in Japan's case.

Compensating Added Cost with Technological Innovation. Higher production costs due to added environmental costs were compensated for by the introduction of new technologies to reduce production costs while minimizing pollution discharges. Japan's real GDP is higher now that pollution controls are in place. New technologies, driven by environmental concern, have turned out to be beneficial to the economy. For example, the development of a low emission technology by the Japanese automobile industry-the result of strict emission laws- has contributed to a much higher mileage per unit of fuel. This fuel-saving technology has been a significant factor in the strong competitive position of Japanese auto-makers in the world market. It could be concluded that the development of *cheaper* and *greener* technologies is at least partly responsible for Japan's economic success.

Achieving Both Development and Environmental Protection. Japan not only excels in economic expansion, but has achieved environmental protection while doing so. Even with the doubling of real GDP over the past three decades, carbon dioxide emission levels have increased by a mere 25 percent, while the sulphur dioxide emission level has been reduced from 5 million tons per annum to less than one million tons. The quality of Japan's rivers has also improved during this period. For instance, the level of dissolved oxygen (DO) in the Ishikari river increased from 8.9 mg/l in 1970 to 11.0 mg/l in the late 1980s. Reforestation is another Japanese success story. Ten million of the total 25 million hectares of current forest cover in Japan have been reforested since the end of the Second World War.

THE INTER-DEPENDENCY OF DEVELOPMENT AND THE ENVIRONMENT

The Relationship of Development and Environmental Protection. The effects of economic development on the environment are now well publicized. The expansion of an economy invariably depletes natural resource endowments and pollutes the environment. But the exact effects of environmental quality on economic development have yet to be made clear. Is there empirical evidence that depleted resources and a polluted environment lower economic growth, at least in the long term? If the relationship between development and the environment is proven to be a two-way street, then environmental protection is an economically sound policy. The following is an empirical example of the inter-dependency of development and environment.

An Example of Inter-Dependency. The Thailand Development Research Institute (TDRI) recently carried out a research project to study the inter-dependency of the environment and economic growth at the macro-level. The study focussed on the relationship between forest resources and agricultural output. Converting forestland into farmland has two contradictory effects on agricultural output. One is the additional income gained from expansion of agricultural land. The other is the income or output lost due to lower productivity. Deforestation results in soil erosion, irregular water flows, drought, and floods, etc. All these factors adversely affect agricultural productivity. Therefore, there is a trade-off between the two effects. Results of the study, showing empirical calculations of the trade-off between these two contradictory functions of Thailand's forests, are summarized in [Table 1](#).

The TDRI study indicated that up to 1984 clearing an additional hectare of forest would positively contribute to overall agricultural output and boost the economy generally. The gain from land expansion outweighed the loss in productivity. After 1987, however, clearing the same amount of forest would negatively contribute to the overall economy. The severity of soil loss, the irregularity of water supply and other factors, turned out to be more costly than the potential income gained.

Finding the Balance. The trade-off indicates that there is a "balance point" between resource exploitation

and economic expansion. The balance point implicitly reflects the *correct* level of resource depletion, or environmental degradation, which Thailand could tolerate. Using examples from the TDRI study, it should be concluded that the *correct* amount of forest cover for the country is approximately 30 percent of its total land area. Clearing the forests after 1984 thus resulted in a net loss for the economy. Using the year 1984 as a benchmark, Thailand's forest cover should remain at the 1984 level-30 percent of the country's total area. Thus when forest cover exceeds 30 percent, it is economically beneficial to expand the national farming area. But when the forest is cleared beyond the 30 percent threshold, it is wiser to do the reverse-preserve natural forests. It should be noted that the study only addressed loss of agricultural productivity exclusively in terms of deforestation. It ignored the value of biodiversity, carbon absorption capability, and other environmental services of the forests. If these were added, the cost of deforestation would be much higher than indicated in the table, and the *correct* amount of forest cover would then also become greater than 30 percent.

Implications from the Study. The study implies that there is a *correct* level of resource exploitation and a *correct* level of pollution that should be accepted for the sake of economic development. Environmental protection is not always economically optimal. In certain cases, over-protection of the environment will do more harm than good. The same study showed, for instance, that one solution to save the forests is to encourage labor migration to the industrial and service sectors. Less labor left in rural areas means less demand for farmland and less danger of deforestation. If Thailand had prohibited the conversion of forests to farmland, even when forests were abundant, the economy could not have become industrialized. Without industrialization-much less land-intensive than agriculture-forests can not be saved.

Determining the Correct Level of Resource Depletion and Environmental Degradation.

Determining the *correct* level, of course, requires skill. The methodology used in the TDRI study, the production function approach, is one way to determine the balance point between development and environmental protection. Currently, TDRI is expanding its studies on balancing development and the environment to cover more types of both natural resources and pollution. The bottom line is that economic gains must exceed economic losses.

ACHIEVING A GREENER PATH TO DEVELOPMENT FOR THAILAND

Learning from Others. What lessons can be learned from other countries, particularly Japan? Should one conclude that "**Pollute First and Clean Up Later**" is the proper tactic for all economies? Without exploiting natural resources and thus polluting the environment in the early stages of development, an economy might not be able to accumulate the necessary capital for industrial development, and would be unable to compete on the international market. After successful development, financial resources could be spent to clean-up pollution and restore deteriorated resources. This is a practice being followed by most developed countries.

Or should one conclude that **Environmental Protection Pays**? Environmental controls stimulate industry to develop *greener* and *cleaner* technologies. Moreover, prevention is cheaper than cleaning-up. The Japanese Environment Agency estimates that the cost of health damages due to industrial pollution is 10 to 100 times higher than the cost of pollution prevention.

Greener Growth is a Necessary Policy. No economy can afford to forego economic expansion. Yet neither can any economy disregard environmental issues. Thus, there is a strong inter-dependency between economic development and environmental quality. A greener path to development simply has to be sought. The problem is to find the correct, and invariably delicate, balance.

A Greener Growth Policy Is Being Adopted in Thailand. Thailand's economic success has permitted the country to look backwards, rethink its previous and future development strategies, prevent further environmental adversities, and repair whatever damage has already been done. New and more stringent environmental laws are being imposed to control waste discharges. Governmental agencies are being restructured to accommodate new environmental policies. Market incentives are being introduced to lower pollution emissions. Cleaner technologies are being adopted by industry. These are just a few of the

innovative ways in which Thailand can save its environment while continuing to advance economically.

Growing with Caution. From now on, Thailand's development policies must *always* take environmental concerns into consideration. New environment-friendly development policies, however, should not proceed at the cost of development. New development strategies should consist of two ingredients: choosing the right industry and adopting the right technology. Industrial expansion is still a must for Thailand. But only the industries that pollute least should be promoted. Industries with high environmental risks should not be welcome in our country.

Transfer of Technology. As mentioned earlier, the added cost of protecting the environment could be compensated by adopting *cheaper* and *greener* technology. Unfortunately, developing countries are seldom equipped to develop their own technologies. These "Cleaner and Greener" technologies must be imported from abroad. International co-operation in technology transfer is thus of major importance. The government must disseminate such technologies to local industries. Thailand's industrial sector is dominated by medium- and small-scale factories, lacking the necessary knowledge to develop the proper technology and the funds to pay for them. Government assistance, technical and financial, is clearly required to promote such technologies in our industries.

Encouraging Better Management and Business Practices. In many cases, pollution and environmental problems are caused by mismanagement. Good management could reduce waste levels and lower accident rates. Industries adopting good management practices thus should be rewarded. The current business ratings for environmentally-friendly industries, initiated by some investment companies, are an innovative way to reward good business practice.

Pricing the Environment Through Market Mechanisms. The environment has traditionally been treated as a free or public good. In the absence of price signals, there is no indicator of the value of the environment. Pricing the environment, particularly through market mechanisms, will provide incentives for industry to control its own pollution discharges. If an industry, for instance, is charged according to the treatment cost of its waste, the price of maintaining the environment will be included in production costs. Then the industry will try to minimize pollution emission either through the adoption of a cleaner technology or through better management practices, or both. This idea, the **Polluters Pay Principle**, was adopted in Thailand with the establishment of the Environment Fund.

Financing Protection Against Pollution. Financing pollution protection is probably the most serious economic issue facing Thailand today. Public and private pollution abatement facilities are costly. Given the domination of medium- and small-scale companies in the Thai industrial sector, investment in pollution abatement may not be possible for many establishments. Financial assistance must, therefore, be provided. Financial resources from abroad are certainly welcome. The Industrial Finance Corporation of Thailand, a government-supported financial institution, has already allocated US\$12 million for industrial pollution abatement loans. This is still a rather small amount of money compared to the actual demand for abatement loans.

Increased Role of Local Government. It is a fact that nobody is more concerned about environmental problems than the people residing in the affected areas. Local governments should be given a greater role in administering natural resources and caring for the environment in their own localities. Financial resources should be made available to them for solving their own environmental problems.