

THAILAND: COUNTRY ENVIRONMENTAL POLICY INTEGRATION ANALYSIS REPORT

INTRODUCTION

Abundant natural resources -- land, water, forest, mineral, fish and wildlife – have provided the raw materials for Thailand's impressive economic growth over the last forty years. Industry and services have grown to dominate the economy, with primary production and processing of agricultural and natural resources now accounting for just over one-tenth of GNP and one-seventh of exports. But Thailand remains the only net food exporter in Asia. Farming, forestry and fishing still provide over half of all jobs – and livelihoods for most of the 9 million Thais still living under the poverty line. Natural resources will likely remain the primary source of livelihoods for the majority of Thai people well into the next century.

By the year 2025, Thailand's population will grow from today's 60 million to 90 million. Coupled with vigorous export-led industrialization and rising per capita consumption levels, demands for food and raw materials will more than double. Meeting these demands will require management of natural resources and environmental systems that is far more efficient, equitable, and sustainable than is practiced today.

Thailand's past growth has been based upon destructive patterns of exploitation of natural resources and environmental systems. More than two-thirds of the increase in agricultural production during the 1960s-1980s was attributable to the expansion of crop areas alone. But farmers reached the limits of decent quality arable land in the mid-1970s. Today well over a million rural households are landless, and 5-10 million people reside -- illegally – in national forests, parklands, and protected watersheds. Forested lands have shrunk from 60 percent of total land area in 1960 to barely 25 percent today. A nationwide ban on logging was imposed in 1990, but current consumption of wood is about five times regrowth rates, with the balance coming from both illegal logging and imports from neighbouring countries, which now over-exploit their own resources to support Thailand. Problematic soil erosion -- exceeding 30 tons/hectare/year -- effects one third of the land, and streams carry heavy silt loads, diminishing the utility of reservoirs and lowland irrigation canals. Soil salinization has become a major problem as an inadvertent consequence of irrigation and intensive cultivation without adequate drainage. The twelve-fold boom in marine fish catch since 1960 has been based on the introduction of destructive trawl fisheries, conversion of fragile coastlands to shrimp aquaculture, and fishing in international waters. The Gulf of Thailand's once-abundant fisheries are badly depleted and the Thai fishing fleet, among the ten largest in the world, now relies heavily on catch taken from the high seas or territorial waters of its neighbours.

Urbanization and industrialization have also taken a toll on Thailand's environmental quality and public well-being. Government surveys find only 14 percent of surface water suitable for aquatic animals and general human consumption, and 37 percent of low quality. Industrial and municipal wastewater treatment systems are generally poorly maintained or completely lacking. Bangkok alone accounts for nearly a quarter of the 33 thousand tons of solid waste generated daily nationwide, and these amounts will likely at least double over the next two decades. While collection efficiency for solid waste in Bangkok is now over 95 percent, in secondary towns and cities collection is generally well under 80 percent, and recycling-reuse is mainly through scavenging. Every day, residents of Bangkok are exposed to levels of air pollution that exceed safe standards. A 1994 study estimated that a 20 percent reduction in the

concentration of suspended particulate matter would generate health benefits worth up to \$1.6 billion annually.

DEVELOPMENT POLICIES

After four decades of stability and acceleration, growth of the Thai economy came to an abrupt halt in mid-1997, when international currency exchange and banking losses triggered a collapse of Bangkok's financial markets. The construction industry ground to a stop, prices of imported goods and inputs soared, and most industries lost access to sources of credit. Widespread layoffs and wage reductions led to significant unemployment – above 8 percent -- in both urban and rural areas. School dropout rates rose, as did drug abuse and other social problems. By the first half of 1998, a million people had slid back below the poverty line, and the incidence of poverty had jumped back up to 12.7 percent – reaching 22.7 percent of all people in the Northeast Region, and 15.6 percent in the South. By mid-1998, the income share of the highest quintile had increased to 56.2 percent from an early 1997 (pre-crisis) level of 55.3 percent.

The recession catalyzed sufficient political support to begin reforming the financial sector, but the strength of those and related economic reforms were due largely to provisions of the new Constitution, and of the Eighth National Economic and Social Development Plan (1997-2001). Drafting of the 1997 Constitution involved widespread participation of people and peoples' organizations, and focused national attention on improvement of governance -- the effective interaction between citizen-stakeholders and their government. Participation, transparency, efficiency, civil rights, due process, and the absence of corruption – a wide range of public process issues have now become common topics of discussion in a society that has long regarded government, with its laws and regulations, as remote and separate from daily economic life. Participation of ordinary people, a theme foreshadowed in the new National Environmental Quality Act of 1992, and notably boosted in the Eighth National Economic and Social Development Plan (1997-2001), is firmly mandated in Article 79 of the new Constitution.

The Eighth Plan shifted Thai economic policy to “people-centered development”, with focus on the poor and under-privileged, with initiatives designed to empower local communities through decentralization of government, public participation in decision-making processes, increased transparency, building of local capacities and self reliance, and other aspects of “good governance.”

The new national policy strategy for governance is encapsulated in “the Three D's”: decentralization, deconcentration, and devolution – shifting responsibility out from Bangkok. This thinking will define the new direction of development for the coming decade. The new emphasis is on development of human resources through education, health care, and social welfare; more equitable sharing through regionalization, participation, and community rights; and conservation of the environment through better management and greater local participation. In environmental matters, the long-discussed “polluter pays” principle, is finally gaining widespread acceptance and being put into policy and practice.

Environmental Priorities

“Thailand’s environmental problems in rural areas include excessive deforestation, destruction of critical watersheds, flooding and soil erosion, sedimentation of irrigation reservoirs, cultivation of fragile lands, overuse of pesticides, over fishing, and loss of genetic and biological resources. In the Bank’s view, during the past several decades there has been under investment in rehabilitation, regeneration, and conservation of valuable natural resources and the environment has been significantly degraded to the point where it may impede further economic development. Shifting

cultivation, urban expansion, and limited effectiveness of control over logging continue to result in deforestation and forest degradation. Meanwhile, the rapid growth of industrial and agro-industrial production has transformed Thailand from a mainly agriculture-based economy into an economy dominated by the manufacturing and service industries. This has resulted in serious air, surface, and groundwater pollution in urban areas. Based on this assessment, both brown and green environment issues need to be addressed in country operations.” (ADB, Thailand CAP 1999)

The five environmental issues that deserve highest priority for Thailand are: (1) management of land resources for agriculture and forestry; (2) water resources management within river basins; (3) urban and industrial water quality; (4) industrial waste management and pollution prevention; and (5) air pollution in Bangkok.

Environmental Capabilities

The Enhancement and Conservation of National Environmental Quality Act, 1992, (NEQA-92) is the centerpiece of Thai environmental legislation, but more than 70 laws and regulations deal directly or indirectly with environmental matters. Similarly, the Ministry of Science, Technology, and Environment (MOSTE) has the central role for setting and implementing policy for environment and natural resources, but at least 19 departments in seven ministries have specific responsibilities as well. Overall policy setting is under the National Environment Board (NEB), a sub-committee of the Cabinet.

The Office of Environmental Policy and Planning (OEPP), within the Ministry of Science, Technology and Environment serves as secretariat to the NEB. OEPP also administers national environmental impact assessment procedures, oversees an annual provincial environmental planning process as well as a national environmental fund, and is developing a series of regional environmental offices. Two other key departments within the current MOSTE are: the Pollution Control Department, which sets standards for environmental quality, and the Department of Environmental Quality Promotion, which includes a central laboratory and training center.

Most management of natural resources – forests, agricultural lands, water, and fisheries – involves the Ministry of Agriculture and Cooperatives (MOAC). Industrial pollution questions, and enforcement of industrial waste treatment standards, are primarily concerns of the Department of Industrial Works under the Ministry of Industry. The Department of Mineral Resources, which oversees mining and drilling for minerals and petroleum, is also under the Ministry of Industry.

In the provinces and municipalities, the Ministry of Interior still administers most governmental affairs, under a system of appointed governors. Bangkok elects its own governor, and the Bangkok Metropolitan Administration, handles almost all aspects of running Bangkok.

In 1996 the Cabinet approved *the Policy and Prospective Plan for Enhancement and Conservation of National Environment Quality, 1997-2016*. This twenty-year Plan, prepared by the Office of Environmental Policy and Planning in collaboration with many government and private sector representatives, had been mandated in the NEQA/92. The Plan sets out a general vision, specific goals, and strategies to accelerate the rehabilitation of renewable resources and to apply environmental management measures to address air and water pollution and solid and hazardous wastes. It will guide the environmental and natural resources activities to be included under the ensuing four five-year plans.

In May 2000, the Civil Service Commission accepted a proposal to reorganize several of the major ministries, aiming to improve efficiency and competitiveness. Under

this proposal, a new Ministry of Natural Resources and Environment would be created, incorporating the resource-oriented departments from the MOAC and the environmental departments of MOSTE. This reorganization, if approved by Cabinet, would have major impacts on the coordination and implementation of resource development and conservation and on environmental protection.

POLICY ANALYSIS

Integrated Natural Resource Management for Agriculture

Decision tree analysis

Traditional development strategies focus on agriculture as the key sector to promote rural livelihoods. But if taken from the perspective of rural farm families who derive their income and subsistence from the land, the conventional definition for *agriculture* – the cultivation of land and livestock – is incomplete. The conventional agriculture sector approach also fails to capture the close linkages between use of arable lands, water forests and wildlife – the full range of natural resources that must be integrated into the livelihood of farm families and rural communities. Nor does it capture the impacts of agricultural development policies and programs on the nation's stock of natural resources and environmental quality. Figure 1 presents a summary decision tree analysis that addresses this larger picture, and the factors that integrate policy decisions about rural natural resource use to the larger economy.

Drivers of Agricultural Demand

Population, domestic standard of living and consumption levels, and export markets are the main drivers of agricultural demand. As diets shift to include more meat and dairy products, more feed must be produced for livestock, and more land devoted to grazing. The Thai population will rise by 50 percent over the next 25 years, and it is reasonable to project per capita calorie intake rising a similar amount, resulting in more than a doubling of basic food demand – nearly a tripling if current increases in consumption of animal protein continue. In Thailand's case, international demands may be equally significant. Thailand is one of the top exporters of rice in the world, and currently is the only net food exporter in Asia. Demands from neighbouring countries and the world market are likely to grow even faster than from the domestic market.

Options to meet agricultural demand

Increasing agricultural production can be accomplished in just three ways: extending the area under cultivation, intensifying the cultivation of a plot of land, or improving the quality of the land itself. During the 1960s-1980s, the land area under cultivation in Thailand roughly doubled – at a cost expense of half of the country's forest cover. Today, with virtually all remaining forest "locked up" in protected areas, the land frontier is closed. Some lands that have been alienated through overuse and mismanagement can be rehabilitated for productive use, but virtually all future increases in production will necessarily come from intensification of agriculture. New crops or cropping techniques are one method, greater use of inputs and technology are the other. While Thailand has taken significant advantage of the innovations of the Green Revolution especially for rice cultivation, there are still major gains possible through continued modernization of the farming sector. Perhaps the biggest constraint to further intensification is the still-uncertain tenure situation for most farmers. Land titling has accelerated in recent years, but is still far from complete. And millions of people, many of them hill tribes and un-patriated minorities, are essentially squatting on public lands. After years of discussion, legislation for community forest management has finally been

submitted to the current government. Until land ownership is clear, individuals and communities cannot be expected to make investments in modernization, or even to practice basic stewardship of the lands that they inhabit.

Environmental impacts

The obvious impacts of extensification of Thai agriculture have been deforestation, unsustainable cultivation of hillsides, and vast over-exploitation of dryland areas, not to mention irreversible conversions of fragile and productive coastlands into poorly managed shrimp ponds. The deforestation has contributed to irregularities in rainfall patterns, exacerbating natural flood and drought cycles. From intensification have come the overuse and misapplication of chemical fertilizers and pesticides, which then affect water supplies and food safety, as well as threaten the farm workers who use them. Intensification has also led to a number of social problems, contributing to the skewed consolidation of wealth while increasing landlessness, joblessness, and urban migration of the unskilled and unsuccessful.

Interventions for the Integrated Natural Resource Management for Agriculture Sector

The decision tree analysis for integrated natural resource management agriculture sector resulted in identification of adverse environmental impacts such as deforestation and loss of biodiversity, soil erosion and watershed disruption, water degradation and wastage, unsafe food, and exacerbation of poverty and income disparities. Matrices were constructed to discuss these impacts for several subsectors – Dryland Agriculture, Forestry, Biodiversity/Protected Areas, Inland Aquaculture, Marine Fisheries and Aquaculture -- and to identify interventions required to minimise these impacts (please refer to main report for details). A summary of key interventions identified for integrated management of natural resources for agriculture sector are:

1. Adoption of regional planning for water and resources based on major river basins

A river basin approach is the most promising way to organize agricultural-based rural development in Thailand. It unifies water resources management, soil and land use, forestry, protected areas management, and community-based activities. In 1997 the Government completed a comprehensive Chao Phraya Basin Water Management Strategy that supports the establishment of a Chao Phraya River Basin Organization. Given the dominating significance – and management complexity -- of the Chao Phraya, this would necessarily be a broad umbrella organization. Alternative models are needed to establish effective river basin organizations for all the main rivers of the country, including for the four tributaries of the Chao Phraya itself.

2. Adoption of rational agricultural and natural resource pricing

In Thailand, agriculture prices continue to be administered by the government, with the objective of pursuing social goals. Agriculture prices based on real costs of natural resources would reduce wastage of agriculture resources and encourage efficiency of agriculture use.

3. Accelerated resolution of land tenure issues

Secure land ownership and demarcation of lands is the starting point of stewardship and sound agricultural practices. Without long-term ownership, farmers can only have a short-term occupancy outlook. Appropriate tax structures, including capitalization tax, are also needed to minimize speculative wastage or degradation of land.

4. Strengthened protection of parks and protected areas

The government has set aside 16 percent of land area in protected areas, with plans to complete the system at about 19 percent. But most of these preserves are “paper parks” with inadequate budget, staff, or facilities. Funding areas is woefully inadequate. A sound and adequate financing system needs to be put in place, and the staff and facilities at parks and sanctuaries need to be built up to cope with needs for protection as well as for tourism and other park values.

5. Rehabilitation of degraded lands

Intensified and expanded activities for restoration of degraded land and soils should be given high priority consideration in the medium term – particularly in Northeast Thailand, which has large areas that are becoming desert. This is a regional problem for all of the central Mekong region.

6. Promotion of sustainable agricultural technologies.

Thailand has long been an agricultural leader, sitting at the center of two major biogeographic regions, with a large base of productive land, relatively benign climate, and industrious farmers. Irrigated cultivation of rice has a long and sustained history, and traditional Thai cropping systems are extremely rich and diverse. Thailand has both the background and the wherewithal to continue to be a leader in global agriculture, but must increase its emphasis on socially and environmentally sound cultivation practices if it is to do so.

Urban-Industrial Environmental Management Infrastructure

Decision tree analysis

As a rapidly industrializing country, Thailand faces a wide range of both industrial and urban waste and pollution problems. A strategic approach might pull together several of the traditional development sectors -- urban development, heavy industry, small-and-medium enterprises, finance, and public administration -- to focus on both public and private sector investments in waste and pollution infrastructure. This environmental infrastructure includes wastewater treatment systems, garbage collection, air pollution control, and treatment of hazardous wastes. It also includes the management that can *prevent or at least reduce* waste and pollution in the first place, thereby reducing the need for physical infrastructure. Figure 2 presents a summary decision tree analysis that addresses this need for urban-industrial environmental management infrastructure.

Drivers of demand for urban-industrial environmental management infrastructure

Sources of waste and pollution include literally everyone – business of all kinds, government at all levels, as well as households and individuals. Business, government, and households interact through two mechanisms: the marketplace, and through the processes of governance. The press and media both interpret events from and to all parties, thereby serving as a key channel of information, and of influence.

Options to meet demand for urban-industrial environmental management infrastructure

Companies control their responses to customers, government, and the marketplace, through management decisions. These management decisions are generally based on perceptions of competition and survival, but may also include elements of good citizenship, reflecting social and environmental values as well as immediate monetary profits. Government policymakers and implementing agencies also work through a range of governance tools, reflecting varying degrees of understanding of the problems as well as varying degrees for effective implementation.

All of these interacting decisions then focus ultimately on a handful of infrastructure design questions: how to prevent or reduce waste and pollution, how best to collect or concentrate it for treatment, how to treat it adequately and safely, and how to safely and effectively dispose of any residues. These decisions lead to the actual investments, both public and private, for solving problems of wastewater, solid wastes, hazardous waste, and air pollution. Interventions that would have high likelihood of contributing to the progress of significant impact on progress in this sector were identified as follows:

1. Integrated Economic and Environmental Planning at the Sub-National Level

Thailand has been at the forefront in the Asian region in attempting to integrate environmental objectives in sub-national or bio-regional development planning. Further strengthening of this approach, with ultimate responsibility to be taken by NESDB, would greatly facilitate environmentally sound development in all sectors – assuming the plans are followed. For this to happen, the relevant national and provincial line agencies need to buy into the plans at the policy level. Such planning recognizes environmental and natural resource constraints to and opportunity for social and economic development as a starting point. The process identifies environmental issues, and potential sectoral competition for resources. It also involves communities and public in identifying issues and planning development investments, secures commitment of line agencies in carrying out the plans, and puts in place an effective monitoring program to ensure that the plans are implemented and environmental objectives met.

2. Strengthen Environmental Impact Assessment (EIA)

The Thai approach of applying EIA as a planning tool for addressing environmental issues at the development project level is appropriate. However, substantial increase in capacity in line agencies and MOSTE, as well as in the private sector, is needed to make EIA in Thailand effective. Considerable international assistance has been provided for this purpose. However, the fundamental problems of poor quality EIA and inadequate monitoring of implementation of environmental protection and management measures

continue to limit the effectiveness of EIA. In addition to more training in EIA and strengthening institutional frameworks in line agencies to integrate EIA in project planning there are needs to increase public participation in the EIA process and increase the awareness of parliamentarians on the issues in order to improve governance of the process.

3. Public Awareness and Participation

The current five-year national development plan places considerable emphasis on public participation. This also raises the need to develop a reasonable level of knowledge and understanding on the part of the public regarding environmental issues. Public environmental awareness should be undertaken at the project-level as well as general education. Such awareness will facilitate meaningful public participation in planning, implementing, and maintaining investments, which involve environmental improvements. In particular, investments in biodiversity/protected area management, natural resources development, agriculture development, and urban environmental/infrastructure and services benefit from local communities' understanding of needs, constraints, and conflicts of use.

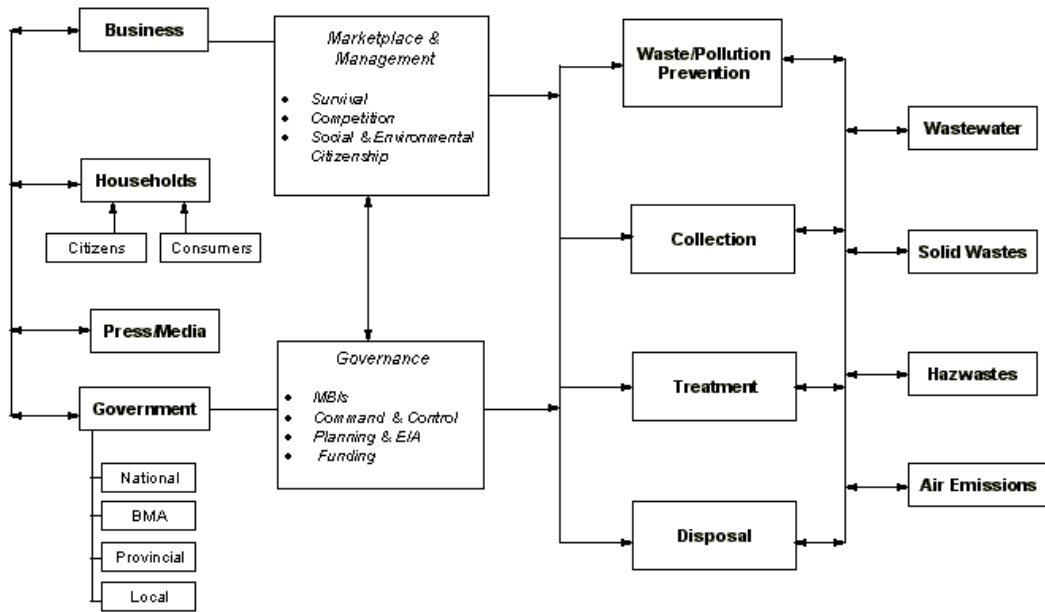
4. Monitoring and Enforcement

A number of new approaches to environmental management, as opposed to command and control, have tremendous potentials for application in Thailand. Cleaner production, market-based instruments, and appropriate resource pricing, for example, rely on a minimum level of enforcement, supported by effective monitoring, as a key stimulus. Several years ago, the ability to shift from very lax to stringent enforcement of regulations was demonstrated by the traffic police in Bangkok. A similar shift is needed in enforcing environmental regulations. Enforcement responsibility is shared by a number of line and provincial agencies. Political will is required to make such a shift and public pressure is required to generate political will.

5. Cleaner Production (CP)

While the promotion of cleaner production policies and practices is primarily oriented towards the industry sector, the potential environmental benefits will be optimized if all development sectors buy into the concepts as a fundamental approach to development. ADB and other donors have been assisting the Thai Government to explore how to integrate CP policies in government operations, urban development and management, tourism development and management, agriculture, and energy as well as industry.

Figure 2. Decision Tree for Urban-Industrial Environmental Management Infrastructure



Sector Policy Recommendations for Integrated Natural Resources Management for Agriculture and Urban-Industrial Environmental Management Infrastructure Sectors

In this section, the policy interventions suggested for the integrated natural resources management for agriculture and urban-industrial environmental management infrastructure sectors have been prioritised with regard to the extent of resultant direct and indirect benefits (including social and environmental benefits), the urgency of undertaking major steps towards implementing the policy and the achievability of the policy implementation. Based on discussions with experts in each of the sectors a set of criteria influencing the choice and prioritisation of policies was identified. A simple Delphi technique was used to assign weights to these influencing criteria in order to prioritise 5 policy interventions. The resultant interventions are ranked and discussed in order of decreasing priority:

1. Adoption of regional planning for water and land resources based on major river basins;
2. Integrated economic and environmental planning at the sub-national level;
3. Strengthened protection of parks and protected areas;
4. Rehabilitation of degraded lands; and
5. Cleaner Production (CP) for industry/

1. Adoption of regional planning for water and land resources based on major river basins

Policy Statement: A river basin approach is the most promising way to organize agricultural-based rural development in Thailand. It unifies water resources management, soil erosion and land use, forestry, protected areas management, and community-based activities.

Measure of impact:

- Improved agricultural productivity on a regional basis would result when water management and watershed functions are improved.
- Reduced environmental impacts – less threat to forests and wildlife; reduced silt, less flooding and drought.
- Reduced cost burden on Government – Reduced cost of flooding and droughts, effective utilization of public investments in dams for power and irrigation systems.

Cost: Establishment of 8 river basin management committees, with technical support and collection of basic information, would amount to an operating cost of less than \$0.6 million per annum, averaged over the next five years. Annual support requirements should be expected to hold steady or to decline somewhat thereafter. This does not include the cost of natural resources management and agricultural development programs to be implemented.

Time Frame: In 1997 the Government completed a comprehensive Chao Phraya Basin Water Management Strategy that supports the early establishment of a Chao Phraya River Basin Organization. This organization is now ready to proceed. If one or two new basin were added each year, expertise and experience could be phased in accordingly during roughly 2001-2010. The process of river basin management would be iterative and on-going, with one or more basins highlighted annually for review and programs

Achievability/Success: Although donor-assisted watershed projects have been underway in Thailand for nearly three decades, the associated problems have worsened in every river basin. Nevertheless, a comprehensive approach to land tenure, agricultural systems, agro-forestry and community forestry for livelihoods and poverty reduction, and to effective protection of parks and reserved forests, all integrated through planning and management of water and soil resources on a watershed basis, is the best hope for sustaining Thailand's agricultural development. While these are formidable problems, the new Constitution's emphasis on decentralization and participation, progress on land tenure issues, and gradual strengthening of concerned departments, and community organizations and NGOs, not to mention the ability to build on all previous and current projects in this area, give reason for some degree of optimism. On the other hand, the alternative to undertaking and succeeding in these programs is further deforestation, soil degradation and sedimentation, and further disruptions and declines in the hydrological cycle.

Accountability / Monitoring: One of the objectives of basin or sub-basin level planning is clear definition of stakes and stakeholders so that consultations and participation can be effective. In addition, this approach facilitates an environmental economic analysis, which internalizes environmental costs of resource extraction or degradation, and supports appropriate resource pricing.

ADB's role: Facilitating and supporting the reform process; capacity building and training of regulators and stakeholders. The planned Year 2002 River Basin Development loan program should be used to lay the basis for collaborating with the Government and other donors for a concerted attack on land restoration and water resource conservation in the Northeast. Unless there are clear synergies or outstanding benefits likely from continued work in the South and North, it may be necessary to concentrate available resources for a serious campaign to reclaim the Northeast alone.

Linkages with other priority policies: Adoption of a river basin approach should have broad impacts on agricultural productivity and sustainability, as well as on national water and power supply.

Impact on the poor: Fulfillment of integrated natural resource planning and programming on a river basin approach would necessarily resolve long-standing constraints on the landless and poor farmers who comprise the large bulk of Thailand's poor.

2. Integrated Economic and Environmental Planning at the Sub-National Level

Policy Statement: Thailand has a base of sub-national or bio-regional development planning experience to build on, such as for the Songkla Lake Basin and for the Upper South, as well as an annual Provincial Environmental Plan process overseen by MOSTE. Further strengthening of this approach, under the ultimate responsibility of NESDB, which has responsibility for national economic and social development planning, would greatly facilitate environmentally sound development in all sectors. But the plans need to be followed. For this to happen, the relevant national and provincial line agencies need to buy into the plans at the policy level.

Measure of impact: Benefits of improved planning and coordination are notoriously difficult to quantify, though the costs of failing to do so are painfully clear. An estimated one-sixth of the government's budget goes to ameliorating or repairing the

impacts of policy and program decisions that could have been foreseen and probably avoided. The cost is probably even higher for the private sector, as companies and individuals misdirect their efforts as a result of inadequate information or clear and sound government policy guidance.

Cost: For the government, a reasonable target would be to have a full 3 percent of the program budgets of line development agencies earmarked for planning, both near and long-term. Basic resource inventories to inform planning for development programs at the regional, provincial, and municipal levels should be targeted at 2 percent.

Time frame: Integrated planning at the regional and sub-regional level needs to be established as a permanent process within government. In line with the commitment under the new Constitution to decentralization and strengthening of local capacities, a decade-long campaign should be undertaken.

Achievability / Success: Past planning exercises at the sub-national level have not been particularly fruitful. In retrospect, they relied heavily on external expertise, and stakeholder participation was limited. National and local capacities are improved, and government commitment to decentralization and public participation is now clear. Again, the alternative of continued poor planning and coordination of natural resources and economic development is simply unacceptable.

Accountability / Monitoring: Integrated planning at the sub-national level begins by identifying environmental and natural resource constraints, and opportunities, and identifies environmental issues, and potential sectoral competition for resources. It also involves communities and public in identifying issues and planning development investments, secures commitment of line agencies in carrying out the plans, and puts in place an effective monitoring program to ensure that the plans are implemented and environmental objectives met.

ADB's role: Funding projects targeted at building capacity in all areas of urban governance as well as specifically on capacity building for regional environmental management. Primary objectives should be to develop community awareness and participation in the selection of environmentally sensitive developments and implementing cost recovery mechanisms, and to build capacity in provincial and regional environmental offices. The Bank may also consider strengthening either or both the Ministry of Interior's Institute for Government Administration and Local Development (IGALD) and MOSTE's Environmental Research and Training Center (ERTC). Finally, the first *Thailand Environmental Profile* (now 15 years old) could be updated, to provide a common starting reference for both public and government agencies.

Linkages with other priority policies: Improved sub-national level planning is key to local implementation of virtually all policies and programs, but most notably for greater decentralization and strengthening of local capacities.

3. Strengthened protection of parks and protected areas

Policy Statement: Poaching, illegal logging, and agricultural encroachment are serious threats in the terrestrial parks, illegal fishing and tourism development are problems in the marine and coastal parks. Visitor rates have roughly tripled from the late 1980s to present. But within the Royal Forest Department, nature conservation is a low priority, and coordination between wildlife, parks, and regular forestry functions is weak at best. Improved coordination and planning for individual parks and regional

park groupings, together with buffer zones are critical. The connections between improved management of the already sizable and rapidly growing nature tourism industry, watershed protection, and both economic and non-economic values of wildlife protection, need to be clarified and given widespread promotion.

Measure of Impacts: Protected areas are, by definition, resources that rank as national treasures, beyond simple financial valuation. Nevertheless, tangible economic benefits include: direct and indirect revenues to tourism and recreation industries, and preservation of a wild “gene bank” to be tapped in perpetuity for science, especially agricultural and medicinal sciences.

Cost: Until Parliament ratifies the International Convention on Biodiversity, access to external funding sources for biodiversity management are limited. But even now, user fees for parks are returned to the central budget rather than earmarked for protected areas. If parks are seen as part of the provincial and sub-regional natural resource base, budgeting for their protection and maintenance would be regularized within long-term and annual budgeting.

Achievability/ Success: So long as management of protection areas remains within the Royal Forest Department (RFD), and remains a resource promotion agency, little progress can be expected. Greater independence for protected area and biodiversity management is currently being debated within government, and may make strengthening efforts feasible.

Time frame: A concerted 6-10 year effort would be needed to establish firmly not just the policy and budgeting authorities, but also the staff capabilities and facilities needed to provide reasonably effective protection and management capacity.

Linkages with other Priority Policies: Resolution of land tenure issues, watershed management, strengthening of local capacities, and public participation would be essential links.

ADB Role: Technical assistance in the area of financing mechanisms, and possibly program assistance to deal with buffer zones and resettlement of encroached populations.

4. Rehabilitation of degraded lands

Policy Statement: Intensified and expanded activities for restoration of degraded land and soils should be given high priority consideration in the medium term, particularly in Northeast Thailand, which has large areas that are becoming desert – and are impacting neighboring countries as well. This has become a regional problem for the entire central Mekong region.

Measure of impact: Deserted wasteland and marginal agricultural areas can be monitored readily by air and ground survey, and will be reflected in local crop production statistics.

Cost and Time Frame: Much of the costs of a rehabilitation program are indirect: costs of land titling and taxation, access to transportation routes, and more effective local planning. A current estimate is unavailable but a rehabilitation program targeted on Northeast Thailand could probably have impact with a minimum investment of \$120 million over a 10- year period.

Achievability/success: Major reforms in administration of the agriculture sector are underway. If these take hold, together with current efforts at decentralization and local participation, program investments can be effective. Also, any program for land rehabilitation should be conducted under the umbrella of the work on regional planning on the basis of major river basins.

Accountability / Monitoring: By integrating these efforts into regional and river basin planning, with strong local participation and transparency, targets for achievement can be identified and monitored, in large part by stakeholders themselves. Improvements in land quality and water flows can readily be monitored from survey and from agricultural statistics.

ADB's role: Building on its major commitment to the agriculture sector and to water management, ADB can take the lead in defining the extent and costs of the problem, and the design of a program appropriate to address it. Other donors would also have key roles, but the first step is to raise priority within government.

5. Cleaner Production

Policy Statement: Both the government and private business find that preventing pollution is clearly preferable to treating it or paying the costs of health and other impacts. Industry takes steps to prevent pollution either to avoid regulatory fines and fees, or because they see internal efficiencies and improved market competitiveness. Since cleaner production – use of management techniques and technologies that avoid waste and pollution -- is also increasingly a concern of international markets, Thailand's government and industry also have a responsibility to ensure international competitiveness by promoting cleaner production.

Cost: The Bank's current Cleaner Production component of the Samut Prakarn wastewater loan amounts to \$7 million. If successful in Samut Prakarn, Thailand's most industrialized province, a similar sized effort should be all that is needed to gear the program up to the national level.

Achievability/ Success: Cleaner production relies largely on market incentives, and international market demands. Thailand is very responsive to both. National enforcement of regulations and standards is also a driver, and government is gradually improving its capacity and commitment to compliance.

Time frame: This is a dynamic sector, and the need is largely to establish a new paradigm, one consistent with other aspects of modernization and globalization. The needed changes in attitude should be achievable within 3-5 years of effort

Linkages with other Priority Policies: Both heavy and small industry would benefit directly from increased efficiency and competitiveness. Urban quality of life and public health would benefit particularly as cleaner production embraces technologies such as more efficient vehicles and cleaner fuels.

ADB role: Technical assistance to build on current pilot scale program.