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# Dynamic Balance for Social Change and Environmentally Sound and Sustainable Development*

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**B**eing an economist who is not much of an expert on social change or the environment, I have to make my observations relatively simple. I will introduce the concept of a dynamic social-political-economic-environmental balance as a way of characterizing sustainable development. Imbalances along the path of development are allowed, and indeed are likely to be the norm. This should not be of concern, so long as they do not become seriously destabilizing. Developing countries are more likely to face imbalances along various dimensions, and their development paths tend to show wider oscillations from one imbalance to another. More advanced societies are likely to be nearer to a static balance, with development patterns showing better balance between the various social, political, economic and environmental dimensions. This suggests that a sustainable development path, from a developing to an advanced or mature society, can probably be characterized as a damped oscillated development path.

After introducing the idea of a dynamic social-political-economic-environmental balance, I will discuss some past and current imbalances in Thailand, with emphasis on the environment. In the final section, some points that would help attain better environmental balance in the course of an oscillating development path are briefly indicated.

## THE CONCEPT OF A DYNAMIC SOCIAL-POLITICAL-ECONOMIC-ENVIRONMENTAL BALANCE

I believe that sustainable development implies achieving some kind of approximate balance between the social, political, economic and environmental dimensions of a country's development. If one or more of these various dimensions of development gets too far out of line with the others, tensions are likely to emerge that may retard, or even forestall, development in one or more of these dimensions entirely. One can probably think of development experiences in various countries that illustrate the point. However, without discussing specific country experiences, indications of types of problems associated with certain imbalances can be given.

- As an economy changes from a simple rural-agrarian structure to a more complex urban-industrial one, potential conflicts between various pressure groups increase and become more difficult to manage for a number of reasons: (1) Greater division of labor, leading to more dependence of various pressure groups on one another and more complex interrelationships between them, increasing the damage each can do to the others; (2) More population living in high density urban areas makes differences in income and wealth more visible, as do improvements in telecommunications and the invasion of television into the rural areas; (3) In a rural-agrarian society, most economic activities are centered around small, local communities so that externalities can be more easily internalized, and feelings of mutual interest more easily cultivated. With changes toward a more complex urban-industrial society, systems to effectively manage conflicts need to take into account a multiplicity of interests inherent in the more complex economic structures. This would only be possible with a more open political system, catering to different interest groups and opinions. If the economy develops but the political system continues to be repressive and lacking in communication channels for identifying, discussing, and reconciling different viewpoints, social conflict may get to the point where even political repression would not work, and economic development may be hampered.
- Alternatively, it is possible that political development outpaces the capacity of the social and economic

structures to adjust. For example, a rapid changeover from a repressed political system with a command-type economy to a more democratic political system with more laissez-faire economies could run into trouble early on, as the required social and work ethic for successful liberalized economic systems may be lacking. This may initially lead to disenchantment, as workers become unemployed and the economy stagnates. If stagnation in the economic system becomes too prolonged, then social unrest may become so great as to have serious repercussions on the political system.

- Finally, economic growth may proceed satisfactorily, but the growth could be driven by exploitation of non-renewable or slowly renewable natural resources. Unless the surplus from such a growth pattern is gradually used to make the economy less and less dependent on these resources, the growth will clearly not be sustainable.

The above examples of imbalanced social-political-economic-environmental development are merely suggested as indicative of what could happen in different societies. An important point to be emphasized is that the essential balance is not a *static* balance in all of these dimensions. It is unlikely that any country can achieve such a balance at all points in time. I also do not think that it is essential for the susceptibility of development to attain such a static balance. This is the reason why I stress the need for *dynamic* balance rather than static balance.

By dynamic balance, I mean a situation in which an imbalance in the above-mentioned four dimensions of development can exist at a particular point in time, but that there are forces that tend to reverse the imbalances before they become self-sustaining and diverge further and further. Thus, sustainable development can exhibit oscillations around situations of balance between the above four dimensions, as long as the various societal tensions that develop as a result of the imbalances do not become too destabilizing.

For developing countries, it is likely to be the norm that development proceeds with imbalances. As a country develops, some parts of its structure change relatively quickly, while others change more slowly, leading to some imbalance. Thus a smooth and balanced development pattern is rather unlikely. Also, at certain points in time, some development goals will take priority over others. Governments may stress some goals in the short run, possibly to the exclusion of other goals. For example, political stability may be the key goal, or rapid economic development, or preservation of traditional cultural values. Because the interrelationships between the various dimensions of development are so complex, and a concentrated focus on some particular dimension may lead to policies that negatively affect other dimensions, it is easy for imbalances to develop.

As a society develops and becomes more advanced and mature, oscillations from one imbalance to another may become less and less. This is because the society would have had long experiences (presumably successful) in managing the various imbalances, and one can expect sufficient pluralism in viewpoints, leading to more balance in the importance attached to various development goals. Moreover, extremes of backwardness in various dimensions of development, such as poverty or political instability, which tend to lead to exclusive focus on a narrow set of development goals, will remain to a much lower degree than in developing societies.

The sustainable progression from a developing to an advanced or mature society is, therefore, likely to follow what in mathematical jargon would be called a damped oscillation, or what I shall call a *damped oscillated development path.* I find this view of sustainable development quite useful in understanding why the concept of sustainable development can mean very different things in various societies at different stages of their development. The acceptable concept of sustainable development (in actual practice rather than in mere lip-service) is likely to vary a great deal among the less developed countries, because at any particular point in time, each is likely to be facing different, and possibly large, imbalances, and the government may believe their solution to be indispensable to the achievement of "sustainable" development. In advanced societies, there is likely to be more convergence in what is meant by sustainable development, and it is probably closer to the concept of static balance in the various dimensions of development than would be the case in developing societies. Because of damped oscillated development

paths, differences in opinions between the more advanced countries and the developing countries, and among the developing countries themselves, about the concept of sustainable development is probably the norm.

It is of course not necessarily the case that the size or the number of different types of imbalances will decline monotonically with the level of development. As a country develops, new types of imbalances may emerge or existing imbalances may become more pronounced. For example, more developed countries may have to cope with increasing problems of crime or the psychological problems associated with mental stress. However, it is expected (or possibly hoped) that, as a society matures, means can be found to manage and contain the imbalances so that they do not become too large or too destabilizing. Thus, the size of imbalances and associated oscillations should eventually decline. The notion of a damped oscillated development path can therefore be qualified as a *(not necessarily continuously)* damped oscillated development path.

There is no guarantee, however, that development will follow the pattern of damped oscillated development. If at certain points in time the imbalances become too large, it is possible that a destabilizing development path will evolve. Countries may become trapped in zero- or even negative-growth situations, or political conflict may devastate the development potential of the country, or depletion of natural resources and the environment may be so extreme as to cause irreversible damage to the social and economic system. Here, ideas from the *catastrophe theory* may be pertinent. If imbalances become too large, they may push society over the threshold that sets a limit on the amount of divergence permissible, below which development can oscillate back toward a balance between the various dimensions of development. In this case, development would not be sustainable.

## OSCILLATED DEVELOPMENT IN THAILAND WITH SPECIAL EMPHASIS ON THE ENVIRONMENT

Those familiar with Thailand will know that the country exhibits so many imbalances. A majority (or all) of them will also believe that Thailand's development is sustainable. Thus, the notion of an oscillated development path, which is likely to be sustainable, is quite applicable to the Thai situation.

I have written elsewhere about various economic imbalances in Thailand.[1] These include imbalances in or between:

- The production structure and the employment structure; with a currently low proportion of GDP from agriculture (about 15 percent) in conjunction with a high share of the labor force (over 60 percent) still mainly dependent on agriculture.
- Different regions; with a substantially higher per capita income in Bangkok and its surrounding provinces than elsewhere. In 1988 the per capita household income in Bangkok was almost four times higher than that of the Northeast.[2]
- The educational structure; with good coverage of basic primary education and higher education, but with low enrollment at the secondary level compared to other countries at a similar stage of development. The gross secondary enrollment ratio in Thailand is by far the lowest in ASEAN, and less than half of what it was in South Korea when that country had the same level of per capita GDP as Thailand has now.

These imbalances are interrelated,[3] and they also relate to problems of natural resource depletion and the environment. Between 1960 and 1980, Thailand managed to achieve a very respectable average real GDP growth rate of over 7 percent per annum. This was, however, driven largely by extensive agricultural expansion. Cultivated area in agriculture increased rapidly. In the 1970s (up to 1978) the cultivated area expanded by over 3 percent per annum, a rate higher than that of the increase in agricultural population; thus the land/man ratio in agriculture was actually rising. The converse of the rapid expansion of cultivated area was the associated increase in rural environmental problems—including deforestation, forest encroachment, cultivation of marginal and fragile land, soil erosion, flooding and water shortages and other natural-resource-related problems. Forests that covered over 50 percent of Thailand's total land area only

30 years ago are down to 25 percent (1988), and even less if forest degradation is also taken into account. Water resources have also been under increasing pressure because of the destruction of critical watersheds, the loss of water control, the sedimentation of reservoirs, and the wasteful use of water by various sectors.[4]

The rapid expansion of the cultivated area, which occurred mainly through encroachment on the reserved forest areas, was the rational response of the rural population to population pressure. In the 1960s, the population growth rate in Thailand was one of the highest in the world, reaching over 3 percent per annum. Population pressure led to migration from rural areas. However, the main migration stream up to 1980 was rural-rural. Basically, the rural population responded to population pressure by migrating to another rural area, and opening up new forest land for cultivation. The migrants who went into the forest areas to open up new land were actually taking possession of the land illegally. But the authorities did not really try to enforce the law. The result is that about 30 percent of private land in Thailand has no formal legal documents of ownership.

To better understand this agricultural expansion cum forest encroachment process, the political situation in the late 1960s and early 1970s must be recalled. At that time, Thailand's neighboring countries were going through war and severe political turmoil. Thailand was regarded as the next domino. Under such conditions, it was understandable that the key focus of the Thai government and of the military at that time was to ensure political survival against the potential threat of communism. This was regarded as the critical destabilizing imbalance that had to be solved. Turning a blind eye to the expansion of the cultivated area into the reserved forests had at least two main benefits. First, it contributed to a sustained increase in rural income, which was one key to a successful campaign against the communist threat. And second, conversion of forest areas into farmland meant less forest cover in which communist insurgents could hide.

The discussion above fits well with the earlier concept of an oscillated development path. Sustained agricultural growth through extensive expansion of the cultivated area and hence deforestation created an imbalance between economic growth and the environment. However, it came about through a perceived threat on the political front. Thus, a focus on a certain objective can create negative imbalances between other dimensions of development.

The situation is now somewhat different. The extensive expansion of the cultivated area into the forests is clearly not sustainable. Even on purely economic grounds, there will be less and less fertile land available. However, because of almost zero private shadow price for forest land, the encroachment has become so serious that severe environmental problems have become easily visible. Flooding and other natural disasters have become more frequent**.** While improvements on the social front such as the rapid decline in the fertility rate and the expansion of basic education have helped to reduce environmental problems associated with forest encroachments from what they would otherwise be,[5] the situation is still severe. The good thing is that the problem is receiving serious government attention. Ultimate solutions are unlikely to be easy, however, because millions of farmers are now settled illegally in so-called reserved forest areas, and these are also the poorer segments of the rural population.

Currently, Thailand is going through another phase of imbalance. Surpluses generated from past agricultural growth have been fairly well managed by the government, particularly through a conservative monetary policy. This enabled Thailand to avoid getting into serious trouble throughout the international debt-crisis period. Together with good basic education and trainability of the labor force, it put Thailand in a position to take advantage of changes in the international economic environment, particularly changes in international comparative advantage. While the Asian NICs are now moving up the production ladder toward more technological and skill-intensive products, Thailand has been able to fill some of the gap in semi-skilled labor-intensive products left by the NICs. The country is now rapidly industrializing, having attained over 10 percent real GDP growth per annum over the last three years.

The current rapid industrial growth, however, finds the country unprepared. When the current Sixth Plan (1986-1991) was formulated, Thailand was still in an economic recession, and the expected average growth at that time was only 5 percent per annum. In actuality, the average rate of growth for the whole

Sixth Plan period will be more than double the expected rate. Infrastructure to support the current growth pattern is now strained to the limit. Further, as most of industries and modern services are located in or around Bangkok, rural-urban migration is increasing rapidly. Congestion and pollution in Bangkok are growing worse and worse. The spatial shift in the population and workforce is also straining the capacity of the urban management system. Hundreds of billions of baht need to be invested in urban infrastructure over the next few years to prevent Bangkok and some of the larger provincial cities from grinding to a halt.

Urban environmental problems, particularly in Bangkok, include air pollution caused by rising levels of industrial and auto emissions; water pollution arising from wastewater from industries and households; solid waste, especially hazardous waste from hospitals, toxic waste from industries and household garbage; coastal pollution and degradation of the natural environment by haphazard tourist development; land subsidence and flood damage arising from excessive pumping of groundwater; diminishing open space and a deteriorating quality of life as a result of congestion, noise, air and water pollution.

Industrialization, urbanization and energy consumption are closely related. Urban centers, especially Bangkok and its satellite provinces, are the preferred sites for industries because of the availability of infrastructure and services, and the proximity to markets and ports. The rural population is attracted to the urban centers because of the availability of employment in industry and services (formal and informal). Since industry is far more energy-intensive than agriculture and urban centers more energy-intensive than rural communities, industrialization and urbanization inevitably result in higher energy demand. Moreover, the growth in incomes that results from rapid industrialization results in demand for more living space and consumer durables such as private cars, refrigerators, and air conditioners, all of which are energy-intensive, and by implication pollution-intensive .

Industrial pollution is most heavily concentrated in the BMR (Bangkok and the five surrounding provinces) and will continue to be so in the foreseeable future, but there are signs that some of the worst polluters are moving out of Bangkok into the satellite provinces of the BMR, which continues to receive by far the largest number of new industries. The BMR, the most densely populated area in the country, accounts for over 50 percent of the 52,000 factories and 23 industrial estates in the country, and generates three-quarters of the manufacturing GDP and total industrial waste. The manufacturing sector is by far the largest generator of hazardous waste, accounting for 90 percent of all such waste in the country. Today, industrial hazardous waste stands at 1.9 million tons per annum and is projected to grow to 5.8 million tons per annum by the year 2001. Two-thirds of this waste comes from the basic metals industry and lends itself to containment and treatment on site, though this is rarely done. The rest (600,000 tons) is produced in small quantities by industrial groups such as fabricated products, transport equipment, electrical machinery, chemical products, textiles, and printing and publishing. Such waste is usually dumped into rivers and landfills, or stored in drums on sites with little or no treatment.

It is clear that the current rapid industrialization, together with the ineffective management of industrial and urban growth, has created yet another imbalance between economic growth and environmental concerns. This simply adds to the imbalance already caused by deforestation, which is still far from being resolved. While environmental concerns are now among the top priorities of the government and concrete policies and programs are emerging to deal with them, Thailand has probably not yet begun to oscillate sufficiently back toward a better balance between economic development and environmental concerns.

## THE ENVIRONMENTAL DIMENSIONS OF A DAMPED OSCILLATED DEVELOPMENT PATH

The key to attaining a damped oscillated development path is to contain the imbalances that are inevitable during the course of development so that they do not add up and become explosive. Just how much imbalance would be consistent with a damped oscillated development path will presumably vary with the type of imbalance and the stage of development and structure of the various societies. I certainly would not be able a priori to identify whether imbalances in certain countries are near or already over the critical threshold.

As far as imbalances associated with environmental issues in Thailand are concerned, some of the following

would help in containing and/or reversing the imbalance.

**An appropriate signaling system.** This involves both an information system to indicate the state of the environment to policy makers and the general public, and also an appropriate system to signal environmental concerns to those whose behavior affects the environment. The latter is particularly related to the "polluters pay" principle. Thus, the amount of environmental degradation should be translated into prices which those who pollute will have to pay. If pollution prices can be made to adequately reflect the level of degradation, then this will have the additional benefit of leading to appropriate trade-offs between economic activity and the environment.

**Institutional set-ups for managing the environment and implementing environmental improvement programs.** As with many other issues in Thailand, the lack of an appropriate institutional set-up makes managing and implementing projects and programs difficult. With so many segments of society responsible for environmental degradation, environmental problems cut across the responsibilities of many different agencies. Problems of coordination and conflict of interest abound.

**Financing.** As imbalances develop and become more severe over time, the costs of rectifying them also increase. It will need a strong sense of purpose on the part of the government to find and commit the required resources for environmental improvement. The present fashion of "privatization" may also help. This is related to the first point about signals, as privatizing environmental improvement projects is usually combined with eventual financing through user charges.

**Education and more involvement by local communities in monitoring, designing, or implementing environmental improvement programs.** More involvement by local communities would serve to decentralize monitoring and control of environmental problems. This is important, as environmental problems are so diverse, and successful solutions or interventions are likely to vary depending on the social and economic characteristics of the locality.

These are only some suggested points. I am sure there are many additional requirements for successful environmental management that environmental experts will be able to come up with.

From what has been discussed in the first section, it should be clear that the imbalances associated with the environment are, of course, only a part, albeit an important one, of the type of imbalances that can threaten sustainable development. Just what are the preconditions and necessary interventions required to manage all the various major imbalances that can arise in particular societies so that they can oscillate back and forth in damped rather than explosive fashion is certainly beyond the scope of this paper or my current comprehension.

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