

Future Challenges of Sustainable Land Use in Taiwan

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Abstract

When we talk about issues related to sustainable environments, there are two important questions to consider: What is a sustainable environment?, and What is the purpose of having a sustainable environment?¹ The purpose of achieving a sustainable environment is not just for achieving it, per se. We can talk about a sustainable environment for the whole universe, the whole Earth, a region, a nation, a city, a rural area, or a small locality? When we talk about the relationship between the emission of CO₂ and global warming, rising sea levels, and climate change, for example, we are concerned about the sustainable environment for the Earth. I will concentrate on issues related to a sustainable environment in Taiwan.

¹ This chapter was presented as a keynote address at the conference cosponsored by Lincoln Institute and ICLPST in Taiwan in October 2006.

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Future Challenges of Sustainable Land Use in Taiwan

Introduction

When we talk about issues related to sustainable environments, there are two important questions to consider: What is a sustainable environment?, and What is the purpose of having a sustainable environment?² The purpose of achieving a sustainable environment is not just for achieving it, per se. We can talk about a sustainable environment for the whole universe, the whole Earth, a region, a nation, a city, a rural area, or a small locality? When we talk about the relationship between the emission of CO₂ and global warming, rising sea levels, and climate change, for example, we are concerned about the sustainable environment for the Earth. I will concentrate on issues related to a sustainable environment in Taiwan.

To answer the second question, What is the purpose of achieving a sustainable environment?, I would propose that it is the enhancement of human welfare, which is based on human judgment. In other words, the reason for us to be concerned about developing a sustainable environment is that it sets the fundamental basis for us to promote sustainable development. Of course, we could broaden our scope to talk about a sustainable environment that includes everything in the biosphere and also the natural environment. But if we leave out the central role of human beings, without concentrating on development, sustainability issues will lose their solid grounding. Without the value judgment of human beings, Mother Nature plays by her own set of rules. The whole system will evolve by its own natural laws and will stay on its own developmental course.

The survival of the fittest and adaptive processes will self-select which species will survive and which ones will disappear. In this process, defining a sustainable environment is difficult. If we believe that this natural process is not sustainable because some species will disappear, then this again is based on the value judgment of human beings. Furthermore, when humans take certain measures to rectify this natural process, this also reflects our value judgment. In a general sense, the purpose of our intervention in this natural process to save some species from distinction is, in fact, to increase the welfare of human beings.

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From this perspective, I would argue that a sustainable environment is a necessary condition for sustainable development. Without developmental concerns, sustainability issues will lose their importance. So this is why I said the reason we are concerned about creating a sustainable environment is because of our concerns over the sustainable development of human welfare.

What is sustainable development? The answer to this depends on what is included in the measurement of development and what the objective of development is. In abstract terms, sustainable development can be expressed as maintaining the capacity to enhance long-term social welfare. We then have to examine what is included in the social welfare. Does biodiversity carry its own value, or is the value generated through human beings' value judgments? I believe it is the latter.

Land Use in Taiwan

The purpose of land use policy in Taiwan is to promote sustainable social welfare development. To achieve this goal, the Taiwanese government must help nurture the environment. Every nation will define its institutional framework, such as a set of institutions and rules under which each player will try to maximize its own welfare based on its natural endowment. In this institutional framework, two elements are important: one is the assignment and enforcement of property rights, and the other is the market mechanism. Different nations and different societies have their own unique institutional frameworks and market systems, which to some extent reflect the content of a sustainable environment. So the environment we are going to talk about later is not the natural environment; instead it is the institutional environment. We will treat our natural endowment as a given and as a constraint, and under this constraint, the people in Taiwan try to maximize social welfare and to create an environment conducive to the sustainable development.

First, some basic facts about Taiwan will lay the groundwork for understanding the later discussion. Taiwan is a small island with 36,000 square kilometers, approximately two-thirds of which are mountainous. The highest altitude is close to 4,000 meters. Since the distance between the mountainous and the costal area is short, rainfall flows into the ocean quite rapidly. The total population is about 23 million, and the total area of cultivated land is about 830 thousand hectares. Among countries with populations more than 1 million, Taiwan has the third highest population density in the world next to Bangladesh and Singapore.

The agricultural land prices in Taiwan are very high, among the highest in the world. The average price per hectare is higher than 10 million New Taiwanese (NT) dollars, about US\$300,000. The average farm size is about one hectare per farm; it has been around this level for the last forty years. The average rental rate per hectare is only about 40,000 NT dollars. The production rate of return on farmland is therefore very low.

The gross revenue of rice farming per hectare is about 100,000 NT dollars, with net profit only around 20,000 NT dollars. Only about 18 percent of farmers are full-time farmers, but the percentage of real full-time farmers is much smaller than that. In the last two decades, the set-aside area of agricultural land has been increasing rapidly and has reached an alarming level. Since 2004, the total land area set aside has grown larger than the existing rice growing area. This implies that, although agricultural land is an expensive and scarce resource, it has not been used efficiently.

The per capita GDP in Taiwan was around US\$15,000 in 2005. The percent of agricultural GDP to total GDP was 1.8 percent. Farmers generate their income mostly from nonfarming activities; in fact, less than 20 percent of a farmer's income is generated from farming activities. The ratio of farm income to nonfarm income is less than 80 percent. Taiwan became a World Trade Organization member in January 1, 2002. Since trade liberalization started in 1996, the agricultural sector has been adversely affected and farmers' income has since stagnated.

Taiwan held its first democratic presidential elections in 1996 and is in the process of becoming a more experienced democratic society. Taiwan is not a member of United Nations, although the country has been applying to become a member over the last 12 years. Taiwan is also situated near China, which proclaims that Taiwan is part of China and opposes Taiwan's UN membership application. Currently, more than 800 Chinese missiles are directed at Taiwan across the Taiwan Strait. Thus, Taiwan has been spending large amounts of resources on national defense. Security concerns in the policy formation process are not an excuse for protection but are a serious matter of survival. After all, without survival, talking about sustainability is a luxury.

In terms of the social environment, Taiwan is in the process of consolidating its national identity. Due to this uniqueness, the problems we face for achieving and maintaining a sustainable environment are also different from many other countries. I would also argue that the definition of a sustainable environment carries different meanings for different

societies. Even within Taiwan, the concept of a sustainable environment for the people living in the mountains is quite different from those living in the plains.

Agricultural land prices are very high in Taiwan and are not, therefore, conducive to agricultural development. The major reason behind the high agricultural land prices is that nonagricultural land prices are also very high, so the expected gains from land conversion are also high. What is the optimal mechanism for agricultural land conversion? How do we decide how much land should be converted and at what location? Should the government make conversions more difficult?

In order to improve the quality of life and enhance the general welfare of the whole society, farmland cannot be locked in the agricultural sector. There will always be competition for the use of farmland. So the question is how to set up a system to harmonize the competition and make an efficient and fair use of farmland. Do we have a serious conflict in land use in Taiwan? How do we resolve this conflict?

Agricultural policy makers in Taiwan have difficult decisions to make. On the one hand, Taiwan's farm income is well below nonfarm income. Farmers are asking for more direct income support and are demanding continuous government protection from foreign competition. On the other hand, Taiwan is under international pressure to liberalize its agricultural trade. Thus, the government has to find solutions to the adverse impacts of agricultural trade liberalization on the farming sector while maintaining farmers' incomes at satisfactory levels.

To modernize the farming sector and maintain farmers' income at a politically acceptable level, some kind of government assistance is unavoidable. However, expanding subsidies and increasing government spending has historically failed to raise farmers' incomes to a satisfactory level. A better solution has to be formulated that not only effectively improves the competitiveness of the farming sector but also maintains a viable rural community.

In a context of very small land size and high population density, continuous rapid economic growth is one of the main factors that have nurtured the farmland price increases. With the stagnation of farmland rentals and high expectations for capital gains, incentives for holding land for productive purposes have decreased over time, while the incentives to hold land as an important means for both preserving existing wealth as well as for speculation purposes have increased immensely. Due to an efficient transport network and

job opportunities in the rural areas, farmland owners who decide to stay in the rural areas can find nonfarming employment nearby and still remain as part-time farmers. The number of part-time farmers has increased rapidly, while full-time farmers are finding it more difficult to enlarge their farms.

Another factor adversely affecting farming efficiency is that the average farm size is small, and farms are also divided into many plots scattered in different places. Even where farmers have decided to enlarge their farm operations, the amount of rent they can afford to pay tends to be low due to high transaction costs and low economies of scale. Moreover, with the combination of efficient rice marketing and price-support systems, standardized and highly mechanized rice farming operations, and only seasonal labor requirements, part-time farmers have found rice growing to be a flexible, profitable, and relatively low-risk operation. They can engage in full-time nonfarming jobs while remaining in the rice growing business. The continuous improvements in farmers' health conditions and farming mechanization have enabled old farmers to prolong their farming careers. Consequently, the numbers of farmers and farms are decreasing very slowly.

There are also continuous calls from the nonfarming sector to allow more agricultural land to be converted into nonfarming uses. Although the expected nonagricultural rent of some farmland is already much higher than its current agricultural rent, to safeguard self-sufficiency of important food items, government policy restricts conversion of this land. This type of zoning restriction creates resentment among landowners, especially when the expected gains from conversion are enormous. Unless the government's decision-making process to allow some land to be legally converted is transparent and coherent, and no huge amount of windfall gains or losses are involved in conversion decisions, resentment will continue to linger.

The expected windfall gains involved in rezoning will certainly invite rent seeking and speculative activities. This issue will continue to be of serious concern to the general public and land use policy makers. This problem is especially acute in suburban areas where agricultural zoning is in serious conflict with the welfare of residents and with urban development. Some would argue that unreasonable agricultural zoning in suburban areas of big cities is the main culprit in causing high land and housing prices, thereby providing fertile ground for speculative and rent seeking activities, enticing illegal conversions, and stifling industrial development by making industrial sites much more expensive.

Hence, the formulation of agricultural land use policy must go beyond the scope of

agriculture. It should also take into account nonagricultural interests. The main issue is how to formulate a policy that harmonizes with the needs of national economic development and promotes the efficient utilization of national land resources.

Agricultural Zoning

Based on the policy of farmland for agricultural uses, those lands classified as farmland under regional planning acts and nonurban land utilization control regulations are not allowed to be converted to nonagricultural uses. The conversion is legal when, after due process, farmland is reclassified into nonagricultural uses.

Under the Regional Planning Act enacted in 1974, the government started classifying nonurban land and putting it under land use control. Nonurban land is classified into nine different zones: special agricultural, general agricultural, rural developed, industrial, forestry, slope land preservation, scenery, national park, and land specifically designated for particular purposes. In each zone nonurban land is further classified into sixteen different kinds of uses; by law land users have to follow the specified use restrictions under which the land is classified. The nonurban land zoning was implemented first in Pin Tong County in 1975, and the last county implemented it in 1986.

The main reason for agricultural zoning is to preserve farmland for food security purposes. Almost all prime farmland, especially paddy fields, without due consideration of its location competitive advantage, was included in the special agricultural zone and legally put under tight control. Once land was classified into the special agricultural zone, obtaining permission to rezone and to legally convert the use of land became almost impossible for private land owners. However, through the comprehensive review of city planning, rezoning is possible. This comprehensive review has become a serious loophole that allows insiders to gain huge windfall gains and outsiders to engage in speculative activities.

Since the original zoning was carried out on short notice, no comprehensive planning was conducted before zoning. The most convenient and least controversial way to conduct zoning without planning is to zone according to existing land uses. This method has created serious land use control problems in the past. These problems include high pressure for illegal conversions which lead to large areas of illegal conversions, inefficient land use, and high land prices.

In response to this problem, the government has conducted a review and partial adjustment in zoning. In light of the many remaining problems, including the changes in the social and natural environment, a comprehensive review of the existing zoning system is still needed before an overall solution can be found. The future review and readjustment of agricultural zoning should consider location factors of farmland and equitable treatment of different land owners; it should also encourage the involvement of citizens in the harmonization of the many different interests.

Agricultural Land Taxation

To reduce the farmer's tax burden, increase the farmer's income, and also increase farm size, farmland is exempted from the land property tax, the land transaction levy, and the value increment tax. In the past few decades, however, speculative activities on farmland have been gaining momentum and generating widespread concern. The call for repealing the tax exemption status for farmland is slowly gaining supporters in the government. However, since so many vested interests are beneficiaries of the tax-exempt policy, it will be very difficult to reform.

Set-aside Land

Since entering the World Trade Organization, Taiwan's agriculture has encountered more competitive pressures, and under WTO rules, Taiwan has started to import rice.. Furthermore, its high population density and high agricultural land prices make land-based agriculture less competitive. In order to maintain the stabilization of the domestic rice market and the income level for the rice farmers at a satisfactory level, current government policy is to reduce the domestic rice production levels and to shift some agricultural land for other uses such as rural tourism, planting trees, set-aside agricultural land, and other nonagricultural uses.

Although the agricultural land is very precious, as evidenced by the high values, the set-aside land area has ironically been increasing over time to an alarming level. The total set-aside land area was 239,724 hectares in 2004, which marks the first time that the amount of set-aside land was larger than the total harvested area of rice, the most important crop in Taiwan. The harvested area of rice has been decreasing over time, while the set-aside area of paddy fields has been steadily increasing.

How to rectify this problem and to utilize agricultural land more efficiently has always been a great challenge to policy makers. The new policies implemented in the past few years to utilize agricultural land more efficiently include afforestation of the plain area and installation of a high-tech agricultural scientific park. Currently, the government is formulating programs to utilize the set-aside land to plant new crops such as sun flowers and sweet potatoes that can be processed to produce diesel and ethanol for energy uses.

Afforestation in the Plain Area

The policy of afforestation in the plain area was certified by the Executive Yuan on August 31, 2001, and enacted on January 1, 2002. The implementation of this policy will increase the forest area in the plain area and will improve the ecological environment. It will also improve the greenery and scenic areas. If the coverage rate of greenery resources in the plain area can be increased, it will create a better environment for promoting agricultural tourism. A better rural environment will also improve the quality of life for farmers.

Providing guidance and assistance to farmers to reduce the agricultural production and to promote afforestation is a kind of policy that conforms to the WTO general norm of a green policy. It is generally believed that if this policy can be properly implemented, it will effectively increase the demand for agricultural lands, reduce the set-aside and vacant land areas, and improve the efficiency of agricultural land use. It can therefore relieve the pressure of oversupply of agricultural products and alleviate the marketing disequilibrium problem.

The concept of afforestation in the plain area is certainly not new or invented in Taiwan. It is widely accepted in Europe. In Germany, for example, forest used to occupy significant portions of territory, and in 1990s the most noticeable trend in forest development was afforestation of agricultural land.

According to the afforestation of Taiwan's Plain Area Scheme, the period of implementation is from January 1, 2002, to December 31, 2007. In principle, areas with low agricultural productivity should have priority to be included in the program, such as those areas that lack irrigation systems, subsidence land along the coast, set-aside sugar cane fields, polluted agricultural land, and agricultural land on both sides of railways.

To decrease the adverse effect of fragmentation in the surrounding agricultural environment and to maximize the positive externality from economies of scale, there is a minimum size requirement for farmers to be eligible for the afforestation subsidy. To qualify for and be subsidized by the scheme, the area of afforestation must be at least 2 hectares in a contiguous piece, or be at least 5 hectares within the same land district.

The government also decided to increase the reward amounts in order to promote the program. Based on the experience of extending the afforestation policy in the slope land area, and taking into consideration the opportunity costs and production potentiality of agricultural land, and as well as the willingness of farmers to participate in the program, the government decided to pay 530,000 NT dollars per hectare for privately owned land for the 20-year period to cover the cost of planting trees and managing the forest.

The government also pays 54,000 NT dollars of direct payment per hectare per year for 20 years to cover the opportunity costs of agricultural land. The current annual rental rate of agricultural land is about 40,000 NT dollars per hectare. If the farmer decides to set-aside his agricultural land, the current basic set aside payment per hectare is 27,000 NT dollars. Since there are two crops per year, the government uses this fact in its criteria to determine the amount of direct payment, which is twice the basic set-aside payment per hectare. In total, the farmer will receive 1,610,000 NT dollars for privately owned agricultural land for a 20-year period.

New Strategy for Sustainable Development

On July 1, 2004, tropical storm Mindulle hit Taiwan, bringing torrential rains that caused mudslides and heavy losses. The Taiwanese government subsequently tried to formulate new strategies to tackle these problems. The National Land Restoration Act was approved by Executive Yuan on May 25, 2005, and it is now sitting in the Legislative Yuan. This act limits or outlaws development in mountainous, coastal, and flood-prone areas. It also forbids cultivating or otherwise developing steep slopes and fragile terrain or areas above a designated altitude. The government will offer incentives to residents living in these areas to encourage them to relocate and sell their land to the government.

Three farms operated by the Veterans Affairs Commission were asked to set an example of land conservation and ecological protection. Chingching, Wuling, and Fushoushan farms will cease all farming activities within three years to allow the natural afforestation of the

land. The government will not renew any leases on forestland currently used to grow fruit, vegetables, or flowers. These tenant farmers have invested large sums of money in their businesses, and the decision not to renew their leases puts hundreds of people's livelihood in jeopardy. To alleviate this problem, the government has promised to ensure that the policy is implemented properly, including job placement services and financial compensation for the displaced farmers. Based on the past experience, it is widely believed that this is a very difficult task to accomplish.

Rationalize Agricultural Zoning and Zoning Adjustment Scheme

In order to improve the current zoning system, it is recommended that the agricultural zone be further divided into a developing zone and a long-term agricultural zone. Those farmlands that have high potential for nonagricultural uses and that are expected to be converted to nonagricultural uses in the near future should be considered for inclusion in the development zone. The farmlands within this zone will no longer be allowed to enjoy the favorable treatments extended to the farm sector. These lands will no longer be tax-exempt and the landowners will have to pay land property taxes and land value increment taxes when the land is transacted.

Improve Agricultural Land Use Planning

The guiding principle of agricultural land use planning should be reexamined, and the main emphasis on the physical productivity of farmland should be adjusted. Planning also has to take into account location factors. Moreover, planning cannot be used to substitute for the market mechanism. The main purpose of planning should be to provide incentives for profitable agricultural production, to stimulate farmers' entrepreneurial spirits, to sufficiently utilize regional economies of scale in agricultural production, and to utilize the market mechanism efficiently.

In the past, Taiwan has made efforts to understand the problems and has made some policy recommendations, but these problems have been stubborn and persistent. I would assume there are no easy answers to our problems; at least the answers are not derived solely from academic exercises. Land and sustainable environmental issues are so complicated that any institutional reform must involve property right reassignment and wealth reallocation, and it is certainly a political issue. In the process of reforming, some people will be significantly affected; for some it is a matter of survival and life style adjustment. Given

such an unfavorable environment, in retrospect, the people of Taiwan have come a long way to reach the current situation. Looking into the future, we believe that we have to face these problems and try to communicate among ourselves the proper and equitable ways to improve the situation. Personally, I believe the current institutional set up is not adequately equipped to face these problems, at least not enough to tackle the serious agricultural environmental problems.