

Harmonious Coexistence with Water: a Lesson from Japan*

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Photo: Reuters/Andress Stapff – 5.28.2002.

Children play in a rice plantation irrigation canal in Gotemba, Japan.

IT'S INSPIRING to observe what happened in Japan with water management and land use. That country is an archipelago surrounded by seas and oceans and is very rich in water sources, coming from the mountains. Japan has a hilly topography – 70% of the area constitutes the Japanese Alps, which make up the dorsal spine of the archipelago, in which there is low density human occupation.

The Japanese Alps are mostly occupied by forests, which protect the soils and control erosion. Even though most of the forests are private property, their exploitation and the trading of the product are usually done

by forest associations. Since the country has a temperate climate, the vegetation takes eighty years to be exploitable and, therefore, forests are considered more as savings than as a short-term return investment.

Both the population density and that of the land use occupation are very high in the Japanese metropolises and in the countryside. With a total area of 327 thousand square kilometers (equivalent to the area of the State of Rio Grande do Sul in Brazil) and with 125 million inhabitants, the average population density is 314 inhabitants per square kilometer. This is fifteen times more dense than the Brazilian average.

Both urban and rural land uses are subject to elaborate rules. A typical profile of land use is the urban occupation of the intersection zones between mountains and valleys. The former are used for foresting and for ecological protection while the valleys are used for intensive agriculture. In the outskirts of urban areas, the plots are rarely idle: vegetable gardens, orchards and diversified plantations occupy those valuable areas, contributing to the food supply.

In Japan, there has been a social learning process about the risks and costs of the improper occupation of the valleys. The valleys in the urban areas are preserved; they usually have open canals for water drainage, linear parks and playing fields, which are flooded with the rains. When the waters are gone, there are no economic or social damages. In Japan, intensive foresting programs in the hills, for the creation of forest cooperatives and for the protection of the vegetation, reduced floods in the lowlands and the damages to agriculture.

But that process hasn't always been this way. Good practices of harmonious coexistence with water resulted from a trial and error process of social learning. The following example shows that stance: at the beginning of the 20th Century, Japan had serious flooding problems coming from its mountains, which had been deforested. The lowlands with rice plantations were often inundated by floods that caused damages, loss of agricultural production and hunger. The country was opening itself to the world at the time, and sought abroad the support of those who were experts in flooding and water management. The Japanese contacted the Dutch, who know how to deal with the sea levels and how to avoid flooding in the lowlands. The Dutch studied the Japanese floods and proposed actions based on their experience. They weren't successful. Then, the Japanese decided to seek their own solution for the problem. The ten-year plan of 1884, which established the guidelines for the entrance of Japan in the modern period of its history, advocated the importance of ongoing improvements in the traditional technologies already available in the country. They observed that, in one of the islands, flood problems were not as severe as in the rest of the country. In that island, mountain soils were protected with forests and the use of firewood hadn't generated much deforestation. Those traditional practices were, then, adopted throughout the country. The forestation of the Japanese Alps was a strategy to avoid soil erosion and the production of sediments. Intense programs for the protection of slopes reduced the floods. Forest cooperatives were created

to manage the forests in a sustainable way, using the wood for furniture and civil construction. Prevention and control measures, such as these ones, have been developed.; Today they comprise the integral maintenance of the forest in the hilly areas, the building of dams to hold back the land that slips from the mountains along with the rain water, and the protection of the slopes by means of metal or plastic nets that prevent landslides.

Today Japan presents a good example of how to live in a friendly relationship with lakes, rivers and streams. City planning and management provide intimacy with water. Streams are not imprisoned in closed canals, a model adopted erroneously in many other countries. The integration of the riverside landscape and its animals, such as frogs and dragonflies, is promoted in urban planning and management. Asphalted streets and roads is reduced whenever possible, in order to avoid drainage problems and floods. Appropriate infrastructure avoids the flowing of rain water directly into the rivers; it slowly infiltrates into the soil. Storage and drainage dams are built in urban areas. Systems for the storage of rain water in underground tanks are adopted. There's preventive action in the territorial planning and in land use.

Japan gives us valuable lessons. The prevention of floods and the integration of water management and land use may be simple. Japan teaches us that the harmonious coexistence with water is a civilizing, cultural and progressive process, in which people learn from previous mistakes.

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