

Designing an appropriate institutional system

In a country called Saarckia, there are about 20 medium or large rivers with outlets into the ocean.

Saarckia is not rich, but for the past decade it has been enjoying fast economic growth. There are no signs at present that this boom will end soon. Local and foreign companies are investing in new businesses of many different kinds. People (especially young people) are migrating to the cities in the expectation of better-paid employment.

The Government of Saarckia is therefore under pressure (especially from business people) to improve infrastructure, and to ensure that better services are provided by public utilities such as electricity and water.

Not all the citizens of Saarckia have been made happy by the changes that are going on around them. There are large groups of people who think that the way of life they are accustomed to is being harmed by these changes. These groups include especially farmers and people who catch river fish. There are also growing numbers of villages whose leaders complain that water in the rivers near them has become scarce, and contaminated.

Another kind of people who are not satisfied are those who feel especially concerned about aspects of the environment.

Saarckia has a devolved system of government. Province councils are strong. The duty of providing the major kinds of water services is divided, at national level, among three large government departments : Irrigation, Public Water Supply (including domestic and industrial water), and Electricity Generation. These three departments come under different ministries, and have local units that correspond to the provinces. Supervision of other water-related activities, such as fisheries, mining, environmental protection, tourism and navigation, is also dispersed among various ministries.

Measurement of water is handled mainly by the hydrological section of the Irrigation Department, since that department abstracts more water from the rivers than any other, and is also the oldest of the major departments.

Systems of payment for water vary widely. Domestic users who have pipe connections to their houses receive monthly bills. Industrial users pay on a scale that is substantially higher. Farmers generally do not pay according to the amount of water they use, if they receive canal water ; but many now have their own pumps, or have joined pump-user groups, and these pay according to their use of fuel or time of pumping.

The Government has recently adopted a new policy, aiming at overall management of water. Full details of the way this will be done have not yet been decided. At present, the responsibility for managing this policy has been assigned to the Ministry of Planning. That ministry has no other functions related to water.

River-basin A has been selected as a pilot case, where basin management will be established. The main features of this basin are shown in the attached map and table. It has three large tributaries, in one of which there are good sites for hydro-electric development, as yet not developed. Two large, rapidly-growing cities (X and Y) lie in the basin. The river-basin boundaries are not the same as the province boundaries, so the area of this basin is divided among three provinces.

At present, the water in the basin is just sufficient for all human uses in the direst month of an average year. But human consumption of water has been increasing, especially for urban uses (domestic and industrial), which have been growing at about 10% per year. The habits of the farming communities have also been changing, as more of them now have personal wells. In some parts of the basin, the level of the water-table has begun to fall during the past five years.

The views expressed in this paper are the views of the authors and do not necessarily reflect the views or policies of the Asian Development Bank (ADB), or its Board of Directors, or the governments they represent. ADB does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with ADB official terms.

The principal environmental concerns in the basin are that the residual flows in the lower parts of the main river have become small and variable, and that pollution and sea-water intrusion are increasing. Fish and bird migrations and breeding have been affected by this, and the numbers of people earning their living by fishing has reduced sharply. Commercial deforestation of the upper catchment has also caused increased variation of river flows, especially reducing the dry-season flows.

The leaders of one of the large cities say that a tunnel should be constructed, to bring water from another basin into one of the tributaries, in order to reduce some of these environmental complaints, and to safeguard the city's water supplies. This is technically feasible but expensive.

Group tasks :

Group 1 Organisations. What new organisations will you establish for managing water in this basin?

What changes will you propose in the roles of existing organisations?

Group 2 Resistance. There has been much resistance to the plans for basin management. What actions or programmes will you propose, in order to persuade people that it will produce better results than the present situation? Consider especially the likely attitudes of these groups of people :

- (a) water users of various kinds ;
- (b) officials in the existing water-related bureaucracies ;
- (c) environmental groups.

Group 3 Finance. How will you propose to finance the activities of the new basin organisation?

Pollution and other harmful effects.

What legal powers and procedures will the river-basin need, in order to reduce or prevent further degradation of water quality in the basin.

	Sub-basins				Whole basin
	1	2	3	4	
Area (km ²)	8,000	7,000	3,000	2,000	20,000
Population (thousands)	800	2,000	3,000	2,200	8,000
Average monthly flow of the river (Mm ³)					
Maximum (August)					12,000
Minimum (March)					1,600
Whole year	1,700	1,300	800	3,400	4,000
Total monthly abstractions of river water (Mm ³)					
Maximum (March)					1,800
Minimum (August)					1,000
Whole year	400	750	175	175	1,500

Present annual requirements for different uses (Mm ³)					
Domestic					1,000
Industrial					1,600
Agricultural					10,000
Irrigated area (ha)	150,000	250,000	90,000	10,000	500,000