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- Collaborating with other organisations where there are common or overlapping interests;
- Assisting the development of advisory systems through capacity-building workshops;
- Producing articles and discussion papers based on comparative research into the science and art of scientific advice.

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**These fictitious names are inspired by Bambara, one of the national languages of Mali.*

Republic of Jibaji*: a fictitious case study

Construction of a dam and governance of water resources

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BRIEF STATE OF KNOWLEDGE

The countries of West Africa have a large number of major rivers and a high availability of water. However, the situation with regard to drinking water is alarming: according to UNICEF, 40% of the population has a round-trip of more than 30 minutes to the nearest source of drinking water. Paradoxically, the countries with the largest water resources are among those with the lowest levels of drinking water coverage. There is still a lack of water management expertise in Africa, which is the continent with the least water infrastructure (less than 2% of global structures).

In addition to energy production, the construction of large dams for agricultural or hydroelectric purposes should help to: (1) Achieve the objective of food self-sufficiency for the local population; (2) Secure and improve incomes for the local population; (3) Preserve the balance of ecosystems; (4) Reduce the vulnerability of national economies to climate hazards and external factors; (5) Accelerate national economic development.

However, these major structures significantly modify how rivers operate, with many environmental, social and economic consequences. They have been severely criticized in the past for their low return on investment, but progress has nevertheless been made in the Senegal River Valley and the Office du Niger (Mali), where rice farming is becoming competitive with Asian rice imports.

Consequences of dam building

With the development of major water infrastructure, a system of dikes can be used to provide gravity irrigation in low-lying areas. This water management facilitates the development of hydro-agricultural installations and crop diversification on previously unirrigable land in the floodplain. However, downstream from the dam, the water is often more salty than before, raising problems concerning water resources for irrigation and consumption.

The authorities and civil society are concerned about the environmental and health situation in the water sector. First, waterborne diseases still have serious impacts on populations, especially

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chronic diarrhoea due to a lack of drinking water and/or sanitation (which also concerns cities that are often subject to water cuts). Second, major wetlands, such as the Inner Niger Delta, Lake Chad and the flood valleys, have seen their surface areas drastically reduced and their biodiversity significantly degraded. Marine deltas are being disrupted by sea level rise, river regulation by large dams and climate change, which are endangering their fragile ecosystems.

The construction of dams has variable and complex impacts on the population of river basins. More often than not, “the shaping of landscapes and lifestyles by the annual flood is replaced by the process of storing and releasing water” (Duvail et al, 2009). The construction of new dams leads to the displacement of local communities, and conflicts over access to land are exacerbated in irrigable areas, because States encourage the establishment of major private investors to improve food production, fuelling concern and opposition among local farmers.

Governance of water resources

On the international level, dam building and water infrastructure have given rise to a number of disagreements (water use conflicts, concerns that the dam will affect another country’s water availability, population displacement, etc.) and even cross-border conflicts. When it comes to the governance of water resources, it is imperative to dismantle the national vision of river basin management in favour of a territorial approach. To that end, there are several inter-state river basin agencies in operation. They provide a basis for effective solutions to sharing the water from major rivers, anticipating tensions and settling disputes. Their effectiveness is nevertheless highly variable and their capacities could be strengthened, particularly with regard to the sharing of accessible central databases for the purpose of conducting studies.

In addition, governance at the local level is of primary importance. As emphasized by GWP (2010), it is necessary to “involve affected populations as project actors, partners and beneficiaries and ensure that all actors involved in project development play their respective roles”. Moving towards participative governance through the establishment of a dialogue with local populations before the project begins is essential for several reasons. First, project efficiency is improved by enhancing the sense of project ownership. Second, population involvement provides a better understanding of the balance that needs to be struck between the actual needs of the people and the realities of the terrain. Local populations are an essential source of information on their culture and environment as well as specific details such as livestock migration and transhumance. To that end, in Senegal during the 1960s, the Société Nationale d’Aménagement et d’Exploitation des Terres du Delta du fleuve Sénégal et des vallées du fleuve Sénégal et de la Falémé (SAED) gave way to local organization among small producers, through the introduction of peasant unions responsible for farm development and water infrastructure management.

FICTITIOUS CASE STUDY: THE REPUBLIC OF JIBAJI*

Jibaji* is a country located in the Sahel region of West Africa. Two rivers run through Jibaji: a principal river that crosses the territory and a secondary river that marks the border with the

neighbouring country of Jamanie*. Jibaji's economy is primarily based on seasonal agriculture and livestock, two activities that are highly sensitive to climate variability. Substantial fluctuations in precipitation over the last century caused several severe food crises, and climate predictions are hardly reassuring in that regard. During the difficult years, many Jibajians abandoned their land, turning to unprofitable informal economic activities such as gold panning.

The regulation of rivers by dams can provide solutions and contribute to the development of West African countries. That is why, 10 years ago, Jibaji* built a dam on its principal river. The benefits of this dam for the local population have proven to be far less generous than those promised by government officials during site visits. There were many negative impacts: displaced populations, degradation of the ecosystem leading to the proliferation of waterborne diseases, problems with access to drinking water, etc. Some displaced farmers were not compensated and their case is still before the courts. The Jibajians who earned their living through gold panning have been deprived of their meager income because of changes in water levels of certain branches of the river, without compensation. The project proved to be economically beneficial for the country, but delays and costs caused by social problems almost compromised its success.

A consensus was reached within the EGAC (Economic Group of African Countries) for the establishment of new water infrastructure, with a view to sustainable economic development. On this occasion, the President of the Republic of Jibaji* made a formal commitment to increase energy production by 40% within 5 years with the construction of a new hydroelectric dam.

A project primarily financed by a foreign investor is currently under study. It includes the construction of a hydroelectric dam on the secondary river, which will increase the country's energy production by 50%. On the banks of this river, water resource management remains largely unstructured. Farmers withdraw water according to their needs to irrigate their small fruit and vegetable crops, by hand or with the use of a cheap motor pump. While this practice is a means of extending the growing season, it creates tensions at two levels. First, at the local level, especially on the outskirts of the town of Dusudònko*, water access corridors have been high transit areas and community gathering places for many generations. After the rainy season, people flock there for the country's most colourful cultural ceremonies. But when water becomes scarce these corridors become conflict zones, especially between farmers and gold panners. Second, at the international level, the government of Jamanie* maintains that the farmers' withdrawals severely reduce the output of its dam further downstream, contravening the agreement between the two countries. Diplomatic relations are strained in the absence of tangible proof of the impact of water withdrawals on the flow of the river.

The project currently under consideration would involve the resettlement of part of the local population and the establishment of a new agreement with the neighbouring country. The financial backers are open to assuming the resettlement costs and facilitating access to water and electricity for the local populations, but under certain conditions: local projects must be

economically viable, fund management must be transparent, and access to resources should not destabilize the dam's electricity production or international agreements.

As a researcher at the National University of Jibaji*, you contributed to a case study of six large dams built in West Africa. This research supports three conclusions:

- The importance of supporting local development alongside a dam's national goals: this prevents protracted disputes that drain government resources over the long term;
- The transition from traditional resource tenure to management of lands under modern law is the major source of tension;
- Local people affected by dams need their rights codified and protected by written agreements to avoid accusations of broken promises, conflicts within host communities, and litigation around compensation.

The President of the Republic of Jibaji* wishes to determine the conditions under which building a dam would benefit the local population while being economically viable. He intends to negotiate these conditions with the foreign investor and the local populations concerned. **You have one month to write a report outlining the issues that need to be addressed. What will be the main message of this document?**

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Group exercises

DISCUSSION

Technical aspects for the building and long-term maintenance of the dam

What technical aspects will you bring to the President's attention to guarantee the long-term success of the project? What resources, expertise and data will be needed? Are there any international standards regarding safety and energy production that will need to be met? What about environmental impacts (soil contamination, changes to the ecosystem, etc.)? Should there be a budget for dam maintenance or will the dam generate enough revenue to cover this?

Socioeconomic issues for local populations

How do you envision the coexistence of family farms and large agricultural enterprises? What are the consequences of population resettlement and are there other possible solutions? Is it possible to build a multi-purpose dam? Where will the employees who will operate the dam come from? What will be the local needs for training, management and administration? How can the responsibility for water and energy resource management be shared between the local people and the government?

Issues at the international level

What terms will have to be negotiated with Jamanie*? What information will be needed in order to do so? What guarantees can we offer them? How can the terms of such an international agreement be applied locally? What will be the consequences if Jibaji* does not honour its commitments to EGAC?

Bonus question

You wish to convey to the President of the Republic the importance of investing in water resource management research in order to obtain local expertise. How can this message place you in an apparent conflict of interest? How do you proceed?

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ROLE-PLAYING

For this role-play, participants are invited to assume five characters and to envision what their positions would be in four different dam building scenarios. What reservations would they have? What points would they want to negotiate? What proposals would they make in order to serve their interests or those of the people they represent?

Roles:

- The Minister of Foreign Affairs of Jamanie*
- The Jibaji* Peasants Union
- The Mayor of the town of Dusudònko*
- The researcher from the National University of Jibaji* (acting as Advisor to the President)
- The foreign company, principal investor in the dam project

Scenarios:

1- The President of the Republic of Jibaji* is moving forward with the building of a hydroelectric dam that will allow farming of land around the town of Dusudònko*. He will create a river basin agency with Jamanie* to manage water access for the secondary river. The agency's Board of Directors will be made up of equal numbers of representatives from Jamanie and Jibaji.

2- The President of the Republic of Jibaji* is moving forward with the building of a hydroelectric dam that will allow farming of land around the town of Dusudònko*. He asks the Jibaji* Peasants Union to propose an efficient water resource management model that complies with international standards and the agreements signed with the principal investor and the government of Jamanie*. 5% of the dam's profits will be used to implement this new local management model.

3- The President of the Republic of Jibaji* decides to build a multi-purpose dam. 50% of the energy produced will be consumed by companies in the regions along the river and the other 50% will serve to facilitate the development of a bold modern agriculture project. He also intends to offer Jamanie* highly advantageous terms to establish trade for the goods produced as a result of the dam.

4- The President of the Republic of Jibaji* wishes to establish a more friendly relationship with the Jibaji* Peasants Union, beginning with resolving the question of compensation for the dispossessed populations. To that end, he would like 10% of the profits generated by the new dam to be used to compensate the people displaced by the dam or by the old dam built 10 years ago.

SOURCES

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