

West African countries such as Burkina Faso have recently been advancing the effective use of limited urban space, represented by the construction of high-rise buildings, for example. From now on, this "urban development" will probably extend to the "exploitation of underground space". The "cut-off wall by an underground diaphragm wall (e.g. soil-cement mixing wall method)" was developed as a construction method for such "exploitation of the underground space". Therefore, this method and the necessary machinery will be introduced sooner or later in West Africa.

From this viewpoint, the applicability of the method using a "cut-off wall by underground diaphragm wall" to the construction of a subsurface dam is increasing in West Africa.

#### **8-4 Costs**

In this project, the direct costs of the construction of subsurface dam and installation of water-pumping and supply facilities were as follows:

- Construction of the subsurface dam 108,595 thousand yen
- Installation of water-pumping and supply facilities 24,900 thousand yen (part of which is an estimate)

The direct costs of installation of the associated facilities were as follows:

- Facilities for groundwater observation 4,160 thousand yen
- Small-scale surface dam with water gates 16,933 thousand yen
- Pilot farm 2,570 thousand yen

The personnel costs for the Japanese engineers who supervised the entire construction work of the subsurface dam are not included in the costs indicated in this section.

#### **8-5 Management and maintenance system**

In this project, when the water-supply facilities started service, the villagers in Kombangbedo Village to which the water was supplied organized a "Committee for the management of the water-supply facilities". This committee collected the water tax, and organized "rotation for cleaning the facilities" as well.

On the other hand, facilities with sophisticated devices such as solar power stations cannot be maintained by the local people alone. It would thus be necessary to set up a system for longer-term management and maintenance with, for example, the assistance of the government of Burkina Faso.

It should be noted however that the solar power station installed in this project was not equipped with "batteries for night storage", which tend to break down.

Thus, ownership by local people and local authorities is essential for the management and maintenance of water resources, including subsurface dams. It is desirable, based on the principle of the participation of local communities and local people, to establish ownership by them from the planning stage of the project.