

### **3. Survey to select the subsurface dam site**

This chapter describes the survey methods of selecting a subsurface dam site and the results.

#### **3-1 Outline of the survey methods**

Generally, a subsurface dam site is selected according to the following procedure:

- 1) Interpretation of satellite images and aero-photographs
- 2) Geological and topographical survey by preliminary exploration
- 3) Estimate of the geological structure by geophysical surveys such as electric soundings
- 4) Verification of the geological structure by test drillings and permeability tests
- 5) Estimate of the flow mechanism of groundwater by observation of groundwater level

Hydrological and meteorological data, such as rainfall and rate of streamflow, are also collected to determine the need and feasibility of a subsurface dam.

On the other hand, management and maintenance of a subsurface dam requires the active participation of the local community. Therefore, it is necessary to undertake a socio-economic study to understand the potential for the participation of the local people. Once the site has been decided, it is also important to encourage their participation from the planning stage.

#### **3-2 Selection of the project area**

(1) Selection of the country for the project

The United Nations Convention to Combat Desertification notes in its preamble that serious drought and desertification has tragic consequences particularly in Africa. Originally, the UN started to deal with the desertification issue, with the serious drought in the Sudan-Sahel region at the end of 1960s to the beginning of 1970s as a trigger. For these reasons, it was decided that this model project be carried out in the Sahel region. Burkina Faso (in particular, the central and the northern part of this country) was finally selected as the site country because it met the following conditions:

- 1) A country seriously affected by desertification
- 2) A country with relatively large areas with aquifers of shallow groundwater
- 3) A country whose political situation is stable

The climate in the northern part of Burkina Faso is characterized by two seasons:

- Dry season (8 months from October to May)
- Rainy season (4 months from June to September)

There are two temperature peaks in a year in this country; the hottest is March to May with a maximum temperature of about 40 degrees centigrade and a minimum temperature of 25 to 28 degrees, and the second hottest is October to November with a maximum temperature of 36 to 39 degrees and a minimum temperature of 22 to 23 degrees. In addition, there are two coolest seasons; December to January with a maximum temperature of 30 to 34 degrees and a minimum temperature of 14 to 16 degrees, and July to September with a maximum