

CHAPTER 6 Recommendations

(1) Using the Master Plan as Guidelines

Proposed Master Plan (Sustainable Groundwater Development Plan for Bogotá Plain) has been formulated through cooperation between the JICA Study Team and Colombian counterparts comprised of organizations involved in use and conservation of groundwater including EAAB, CAR, DAMA, INGEOMINAS, IDEAM, with two years of the study. For effective implementation of the Study and formulation of rational and comprehensive plan, exchanges of opinions were carried out through two technical transfer seminars, 16 Steering Committee meetings and 38 workshops.

Groundwater development, conservation and management plans proposed in the Master Plan have been compiled with objective and scientific approaches on the basis of accumulated data and information, such as those on natural conditions including meteorological, hydrological, and hydrogeological ones, on well inventory surveys and on water demand forecast, obtained with continuous efforts for observations and measurements. Results of investigations and analyses, which were carried out before the formulation of the plans, show that annual mean recharge of groundwater amounts to around 20m³/s. This volume corresponds to 18% of annual rainfall (800mm). At present, nearly 20% of the recharged groundwater is exploited for irrigation, including that for floriculture, and industrial and domestic supply to sustain important social and economic activities in the Bogotá Plain. In the Master Plan, strategic approaches are proposed to secure sound groundwater development that will allow sustainable use and will meet with future demands. The Master Plan can be used as guidelines to contribute to continuous use of groundwater for more prosperous socio-economic development of the people living in Bogotá Plain. It is recommended that relevant organizations should make the most of the Master Plan as guidelines.

Although Master Plan has been formulated with the target year of 2015, the plan should be revised when water demands vary due to substantial changes in socio-economic conditions or when important information including that on natural conditions obtained through further surveys and investigations such as hydrogeological ones are available.

(2) Continuous Improvement, Management and Applications of Information on Groundwater and Analytical Tools

Information on groundwater and analytical tools, such as well inventory, GIS database, and groundwater simulation model, submitted as outputs of the Study should be succeeded, managed and improved when additional data are obtained, by the counterparts of the Study for the moment. After the establishment of Technical Commission for Groundwater Management is established, as proposed below, it would be recommendable that the committee would succeed, manage and improve the information and these tools, and make full use of them.

(3) Immediate Start of Preparation for the Implementation of Proposed Projects

In the Master Plan, two projects are proposed, i.e., 1) Groundwater Development and Conservation Project on Eastern Hills of Bogotá Plain (Eastern Project), and 2) Groundwater Conservation Project in Areas of Intensive Groundwater Use (Western Project).

The Eastern Project has objectives of municipal water supply to urban areas of Bogotá D.C. and of improvement of water environment in the Bogotá River. In the Eastern Project, production/recharge wells, and water treatment facilities are to be constructed. The Western Project has an objective of improvement of groundwater environment in areas where

groundwater is highly exploited. The Western Project has two components; 1) construction of recharge facilities and 2) research and development of technology to reduce loads on the groundwater resource caused by intensive use.

Viability of both projects is confirmed at master plan level. Feasibility Studies for both projects with more precise data and information, however, should be conducted to appraise the feasibility of the projects in terms of various aspects such as technical, environmental, economic and financial ones. It is recommended that Bogotá D.C. for Eastern Project and Ministry of Environment for Western Project should take the first step of actions immediately.

(4) Institutional Strengthening for Groundwater Management

CAR and DAMA, as main role players in water resources management, should take preparatory processes for the establishment of Technical Commission for Groundwater Management under Joint Commission of the River Basin that is in the process of establishment at present. Counterpart organizations for the Study can be the best candidates to participate in the Technical Commission. It is recommended that the Technical Commission should further study on promotion of coordinated activities for the monitoring and evaluation, zoning and development of instruments for demand management, promotion of well registration, establishment of registration system of drillers, legal arrangement for granting water rights in artificial recharge projects, and promotion of human resource development for hydrogeological professionals, and actively proposed to its upper organ, i.e., the Joint Commission.