



WATER, SANITATION, ENVIRONMENT and DEVELOPMENT

Evaluation of groundwater use in rural Ashanti



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Introduction

Ashanti Region has a rural population of 1.4 million people (1984) which forms 68% of the total population of the region. Thirty-two per cent of region's population still does not have access to potable water supply. The region has 7453 communities of which about 98% live in a rural environment. In most of the rural communities potable water is a precious commodity. Groundwater has been the most convenient source of water supply for domestic purposes and has been exploited by means of boreholes fitted with handpumps.

About 1300 boreholes have been drilled in the region in the past decade by both government and non-governmental agencies among which the Catholic Church has played a prominent role. The church has provided over 80 boreholes in over 60 villages with sponsorship from donor agencies abroad. The drilling contracts have been executed by the Prakla Seismos Geomechanik GmbH of Germany based in Ghana.

In 1990 the Catholic Diocese of Kumasi requested the Water Resources Research Institute to assess and evaluate the impact of these facilities in selected villages before more funds could be committed to further projects.

The project area

Ashanti Region covers an area of 238,000 km² which is about 11% of the total land area of Ghana. It lies almost at the central part of the country and has 18 administrative districts with its regional capital at Kumasi (See Fig. 1). It lies within the moist semi-deciduous climatic region of Ghana which is characterised by thick forests. The mean annual rainfall and temperature lie between 1250mm and 1750mm and 25.5°C and 28.0°C respectively. The region is drained mainly by the Ofin basin and partly by the Afram basin.

Geologically the region is underlain by basement rocks of the Pre-cambrian to Palaeozoic Era. The main lithologies are granites, Birimian and Tarkwaian phyllites and the Voltaian sandstones and quartzites. Confined and unconfined aquifers occur in almost all geological formations but they are mostly controlled by weathering, fissuring and fracturing of the bedrock.

Scope of work

The post-project evaluation covered the following:

- pre-installation activities;
- the installed borehole water supply system;
- the operation and maintenance of the system, and
- the socio-economic and health impacts of the project.

Work carried out

The work was carried out in three areas namely, the office, field and the laboratory.

Office work

This was mainly the collection and collation of data and information in the form of reports and interviews. These were done with the help of the Catholic Secretariat, Prakla Seismos, Ghana Water and Sewerage Corporation (GWSC) who provided reports and granted interviews to evaluate the pre-installation activities carried out with regard to community participation in planning and implementation of the programme.

Questionnaires were also administered in the field to provide information and records in areas such as cost of operation and maintenance, institutional set-up for collection of tariffs, user satisfaction, affordability of tariffs, populations served and health aspects. Also information on economic and social benefits were covered. Medical records were obtained from the Ashanti Regional Ministry of Health Statistical office which covered 11 health posts, two hospitals and one clinic.

Field work:

Reconnaissance visit was made in January, 1990 but the final evaluation work was done in August and September, 1991. Information was obtained from the GWSC Drilling Unit in Kumasi on the scope of operational activities in the region. Groundwater samples were collected from selected villages. Interviews were held with personnel of the Catholic Diocese and GWSC personnel in the districts, Chiefs, Town Development Committees, Women's organisations and the para-medical staff at health posts. Borehole installations were also visited for on-site inspection.

Laboratory work

Water samples were analysed in the laboratory in Kumasi (GWSC laboratory) and Accra (WRRRI laboratory) for physico-chemical and bacteriological analyses.

Findings

Pre-installation activities

In communities where water committees were initially established to plan the water delivery system, eg. Warakese, Drobon and Afransie, considerable improvements were derived. However, on the whole it appeared the establishment of village water committees to be involved in planning, implementing and overseeing the water projects was not carried out. This has led to poorly managed systems which have not helped to realise fully the goals of the projects. For example, only 24.5% of the total component of installation cost to be borne by the communities within Offinso district had been recovered by February, 1989.

Installed borehole system

Poor siting probably due to the desire to avoid drilling dry wells has led to the situation where some unprotected sources are still preferred to some boreholes due to their proximity, particularly at one community in Kenyasi.

The yields and quality of water from the boreholes are generally acceptable for handpump operations in rural water supply. However, the number of boreholes are not adequate to meet the target population. Thirty-two per cent of the rural population still lack potable water supply.

Operation and maintenance

The installed handpumps (German Pumpen Boese Mk.II) which is the main component of the delivery system were found to be largely efficient. A centralised maintenance crew employed by the Diocese and trained by the contractors conduct the maintenance work. The cost of the maintenance work is borne by the communities.

Borehole water use

In almost all the communities, the use of the borehole water is limited to domestic purposes only due to the demand exceeding the supply. In some areas eg. Mpehin, the pumps are locked up during certain times of the day largely to ensure adequate recovery of the borehole and also for controlling the use of the pumps. It was discovered that 46% of the people still depend on the unsafe traditional sources of water for domestic purposes due to the inadequate supplies. In 50% of the communities, the recommended borehole to persons ratio of 1:300 is far exceeded. Figures as high as 1780 people to one borehole was recorded in Nyinahin. Presently, installed supply systems serve only about 30% of the domestic requirements of the communities. This percentage is reducing with the growing population of 3% per annum. In spite of these limitations some boreholes are rejected if not entirely at least partially for reasons given below (percentages of responses are included):

- a) overcrowding at borehole sites (75%);
- b) unreliability due to frequent breakdowns (13%);

- c) distant location of the system in relation to other water sources (10%);
- d) aesthetically unappealing i.e. bad colour, taste and/or smell (20%).

Health and socio-economic impact

Health impact

One of the main reasons for the provision of the boreholes was to curb water-related diseases in rural communities. Available records are not adequate to confirm this impact for some reasons namely: not all communities have health centres and for those who have records are not continuous for proper analysis; few people report health cases to the health centers given the presence of numerous traditional herbalists who hardly keep records. However, data from the questionnaires indicated that 30% of the people believe water-borne and water-related diseases have reduced. General health and sanitation conditions have improved with the increase in knowledge of the awareness between water and health due to health education. This however needs to be expanded to consolidate the gains made.

Economic impact

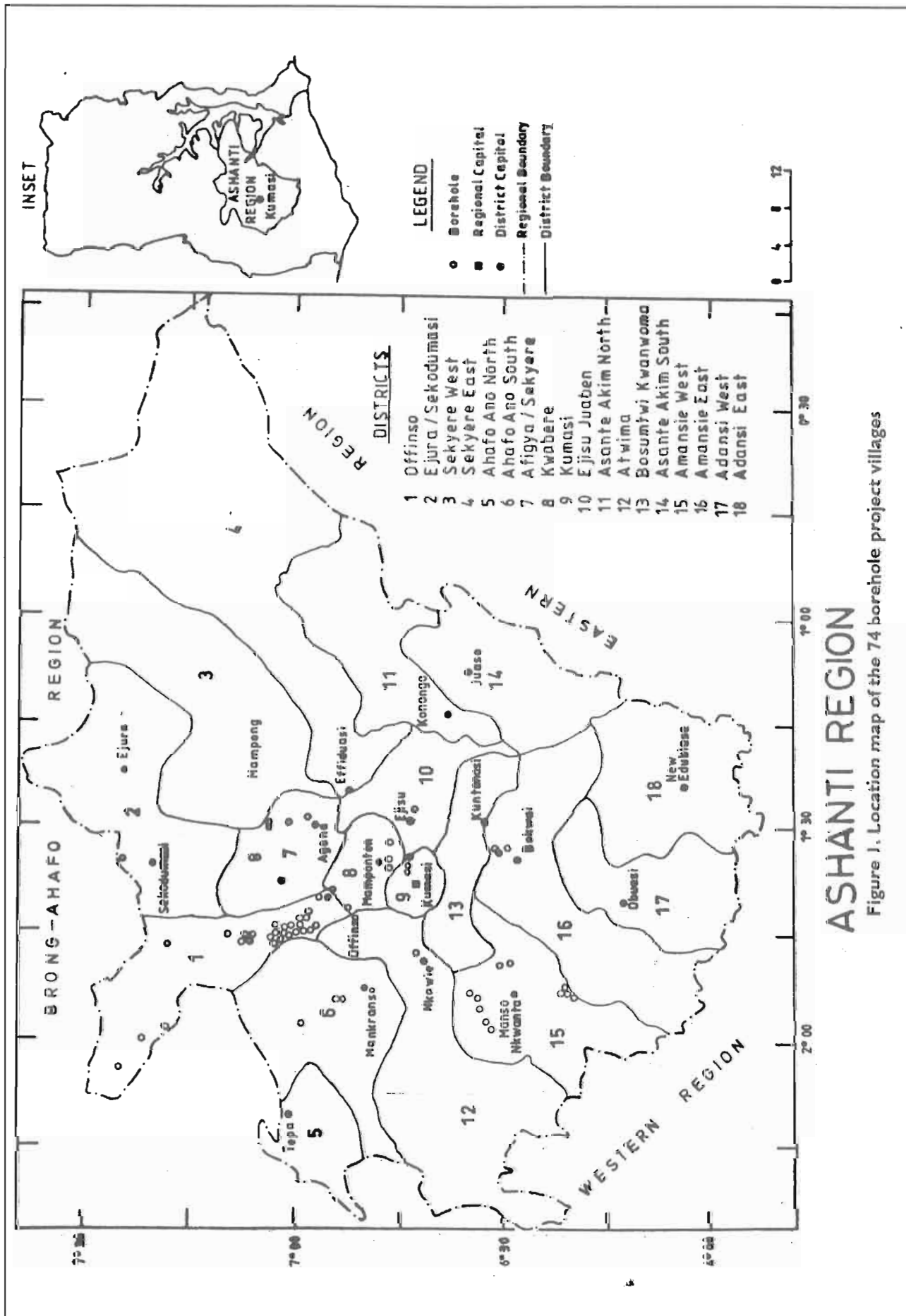
More than 60% of the people expressed gratification for the help derived from the boreholes. Forty-nine per cent have reported making additional income from the boreholes in related jobs such as small scale soap and palm oil production, washing of clothes and sale of ice cold water. This impact is greatly hampered by the restrictions imposed on the use of the water for commercial purposes in most of the communities.

Social impact

There is hardly any direct measure of this impact however, certain factors identified indicate general improvement in the social life of the people. About 90% indicated some form of improvements in their lives from the provision of the boreholes notably through the enhancement of other development activities. Also community participation in social activities have improved especially through the availability of convenient water during the dry season. More than 33% of people interviewed claimed improved relations with neighbouring communities as they regarded the boreholes as communal facility that must be shared.

Conclusion

Provision of the borehole facilities in rural communities in the Ashanti Region has eased the water supply problems in these parts of the region. The great amounts of energy and time wasted in the past in search of water for domestic activities have been reduced. Incidence of water-borne and water-related diseases acquired from unprotected sources of water supply can now be controlled. General



improvements in health and sanitation conditions have brought about improved standard of living. Social and economic gains have been made from community participation in development projects and good neighbourliness.

References

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2. WRR (1992) - Evaluation of rural borehole water supply programme for selected village communities in the Ashanti Region of Ghana.
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