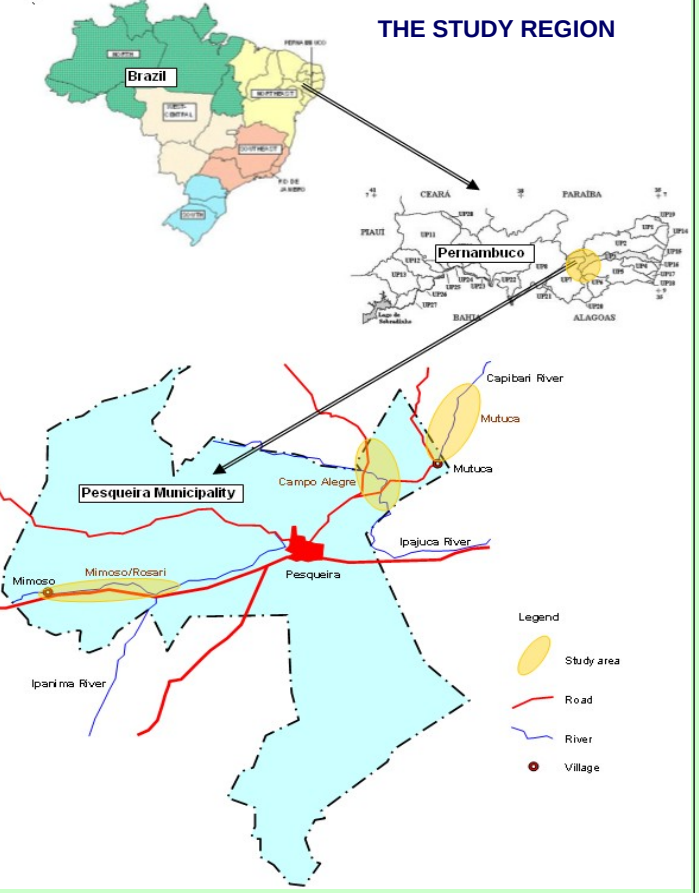
THE STUDY REGION



The study region for this Project is based in the state of Pernambuco, which has a climate ranging from tropical along the coast to semi-arid (Sertão) in the interior. Long periods of drought have limited the extent of agricultural activity, with rural productivity in the region in the past fifty years centring on logging of local forests for charcoal production. This activity has had severe detrimental effects on the local micro-climate resulting in desertification, ensuing increased rainwater run-off and decreased recharge of the local alluvial aquifers.

Extreme Contrasts in Climate (Campo Alegre)

THE PROJECT

The Project has four main aims:

1. Develop and disseminate clearly understandable and culturally appropriate guidelines for sustainable groundwater resource management, primarily targeted at rural communities.
2. Facilitate and increase understanding amongst the rural population of the potential benefits that arise from sustainable and technically appropriate groundwater resource management, and to create awareness of the implications of overuse of the resource, in the context of seasonal and long-term variability in hydrological and climatic conditions.
3. Empower community representatives (farmers, farmer representatives and other local groundwater users) in the active monitoring and collective management of the groundwater resource.
4. To empower the younger members of the communities through active participation in environmental education and monitoring.

THE LOCAL COMMUNITIES

- Lack of water for domestic use is evident during drought periods and creates significant inconvenience and suffering for the local communities. During drought periods, traditional sources become unavailable due to either shortage of water or poor water quality and communities become dependent on water supply by water truck.
- The social structures within the local communities that participate in the study are diverse. Their livelihoods revolve around subsistence agriculture with irrigation playing a role of varying importance, and livestock. Uncertainties in climate, combined with inadequate understanding of groundwater resource availability and sustainable use, has led to both reluctance to invest and loss of income due to crop failure.
- Droughts severely impact on community relationships due to inadequate institutional arrangements regarding the exploitation of groundwater. Groundwater is being exploited by entrepreneurs for water supply to the more affluent in urban centres, possibly at the expense of water users within the communities. Availability of scarce groundwater resources also becomes constrained by well and land ownership.

THE PROJECT TEAM

The Project team comprises junior and senior specialists from Brazil and the UK with distinctly different professional and cultural backgrounds. The Brazilian collaborators include the UFPE,UFRPE and independent consultants, while the UK collaborators include Mott MacDonald and Birmingham University. Close collaboration between the technical and social development sub-teams has contributed to the successful outcome of the Project.

KEY PROJECT ISSUES

Project outputs have been identified as follows:

a) Inception: Livelihood, Water Use and Environmental Surveys

b) Package 1: Guidelines for Sustainable Water Resources Management

c) Package 2: Framework for Participation and Education

d) Package 3: Operational Strategy for Integrated Communications

e) Package 4: Guidance on Monitoring and Intervention Strategies

Commencing from the basic aim of the Project which is:

- Capacity building of local communities in semi-arid areas to achieve sustainable use of groundwater resources for domestic and agricultural needs.

And seeking to achieve these purposes through:

- Developing community awareness of catchment hydrology and appropriate methods of water resources assessment and sustainable management.
- Developing community level awareness of short and long-term approaches to minimising the impact of drought that acknowledge the uncertainty in the climatic conditions in the region and include some assessment of risk (notably by the farming communities).
- Developing community understanding of water management and the role of community-based water management, recognised and supported within existing national and regional policy frameworks.
- Education in the areas of water harvesting, storage and water quality, health issues and environmental awareness.

Then the key issue for the Project is the choice of approach to creating the community framework that can be the recipient and repository for the anticipated developments in such a way as to ensure that the developments achieved during the two year project period have a lasting rather than a transient impact.

KEY ACTIVITIES

- Livelihood, water use and environmental surveys within the rural communities participating in the Project

Survey Interview

- Engagement of local communities in the Project process through the establishment of an Advisory Group, comprising representatives from the participating communities, Project team members, health workers and teachers. Monthly meetings have been held and have contributed to cross-community awareness, conflict resolution and enhanced awareness of water and environmental issues.

- Themed workshops have been undertaken to engage the local community and to begin to demonstrate the relationship between community control of groundwater and drought mitigation. The workshops are largely run by the local communities with the Project team members acting as facilitators. The themes have included:

Workshop in Campo Alegre

  - Water storage and use for domestic purposes
  - Water for farming, including irrigation
  - Land management for improved water harvesting and retention
  - Institutional and organisational aspects of groundwater management

- Collaboration with local education and health authorities on the introduction of Environmental Education at schools located within the participating community areas. School children are now involved in various types of monitoring, such as for example rainfall and groundwater levels, using monitoring equipment developed at very low cost at UFRPE (Rural University of Pernambuco).
- Extended involvement of rural communities, including the Xukurú indigenous community, with unique organisational structure and environmental awareness, and Mimoso Seco, a community with long-term established irrigation practice and involvement in organic agriculture.
- Technical studies, including monitoring and assessment of groundwater resource availability, with involvement of students from both Birmingham and Brazilian Universities

PROJECT ACHIEVEMENTS

- Successful integration of social and technical components.
- Through active participation, community members, local teachers and health agents have developed the interest and skills to continue the Project activities.
- Improved understanding of water resource availability in the context of climate and land management and active participation of local communities in water resources monitoring.
- Water and land resources management concepts and participatory monitoring have been included as components of an Environmental Education Programme. The programme is being implemented with municipal government support and involves teachers, education specialists, as well as local farmers. Farmers are involved in teaching activities and in the preparation of the educational material, thus recognising their traditional knowledge.
- Resolution of conflict between the indigenous Xukurú community (owners of the Pão de Açucar Reservoir) and local farmers in downstream Campo Alegre has resulted in water sharing and active participation of the Xukurú in the Project. This was an important step towards the formation of Water Users Associations, another important action towards sustainable water resources management.
- The Project actions have demonstrated that once the population is listened to and is given voice, Projects can be successful and contribute to an improvement in the livelihoods of the beneficiary communities.

The Challenge: Coping with Water Shortage and Surplus

Water for Health

Water for Prosperity

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DFID ENGINEERING KNOWLEDGE AND RESEARCH PROGRAMME

Project: R8333 Sustainable Use of Groundwater in the Semi-arid Ribbon Valleys of Northeast Brazil

"It is easier to observe the movement of the stars than to understand the movement of the waters"

Galileu Galilei