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Rural areas water and sanitation plan

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INTRODUCTION

During 1988 and 1989 Umgeni Water undertook a major planning study known as the Water Plan 2025 (Horne, Glasson and Partners, 1989). This study was far reaching and incorporated an analysis of political scenarios, demographics, employment, income levels and many other aspects related to water usage. The outputs from the plan included likely water demands for bulk infra-structure planning but also a series of objectives, strategies and action plans devised to ensure that the recommendations of the water plan would be addressed in an ongoing and pro-active manner. Perhaps the most significant of all the objectives arising from the Water Plan 2025 was as follows :-

"In pursuance of the Board's Objective and Management's stated Purpose, Umgeni Water has adopted a strategy to provide a potable water supply to all in established areas within its region of supply by 2005".

In order to meet this challenging and ambitious objective, Umgeni Water commissioned the Institute of Natural Resources at the University of Natal, Pietermaritzburg (INR) to prepare a Rural Areas Water and Sanitation Plan (RAWSP). The intention being that the RAWSP will form the vehicle, or master plan, by which the objective to provide services to rural/informal areas will be achieved.

From the outset it was recognised that a simple technical/engineering approach would be fatally flawed since the greatest problems with rural and informal water and sanitation supply relate to issues such as administration, education, local politics etc etc. An eclectic approach was thus adopted covering areas as diverse as education, appropriate technology, administration, marketing, funding, engineering proposals, planning agencies and a futures perspective.

In view of the scope and diversity of the study, this paper cannot attempt to do justice to all the facets. The objective of the paper will thus be to give an overview of the study and to emphasise the

most important elements and findings. A brief description of the study area and its characteristics is given and this is followed by an overview of the planning environment, institutional issues and the project implementation and management approach. Thereafter water and sanitation supply proposals are discussed and finally conclusions and the likely future direction of the initiative.

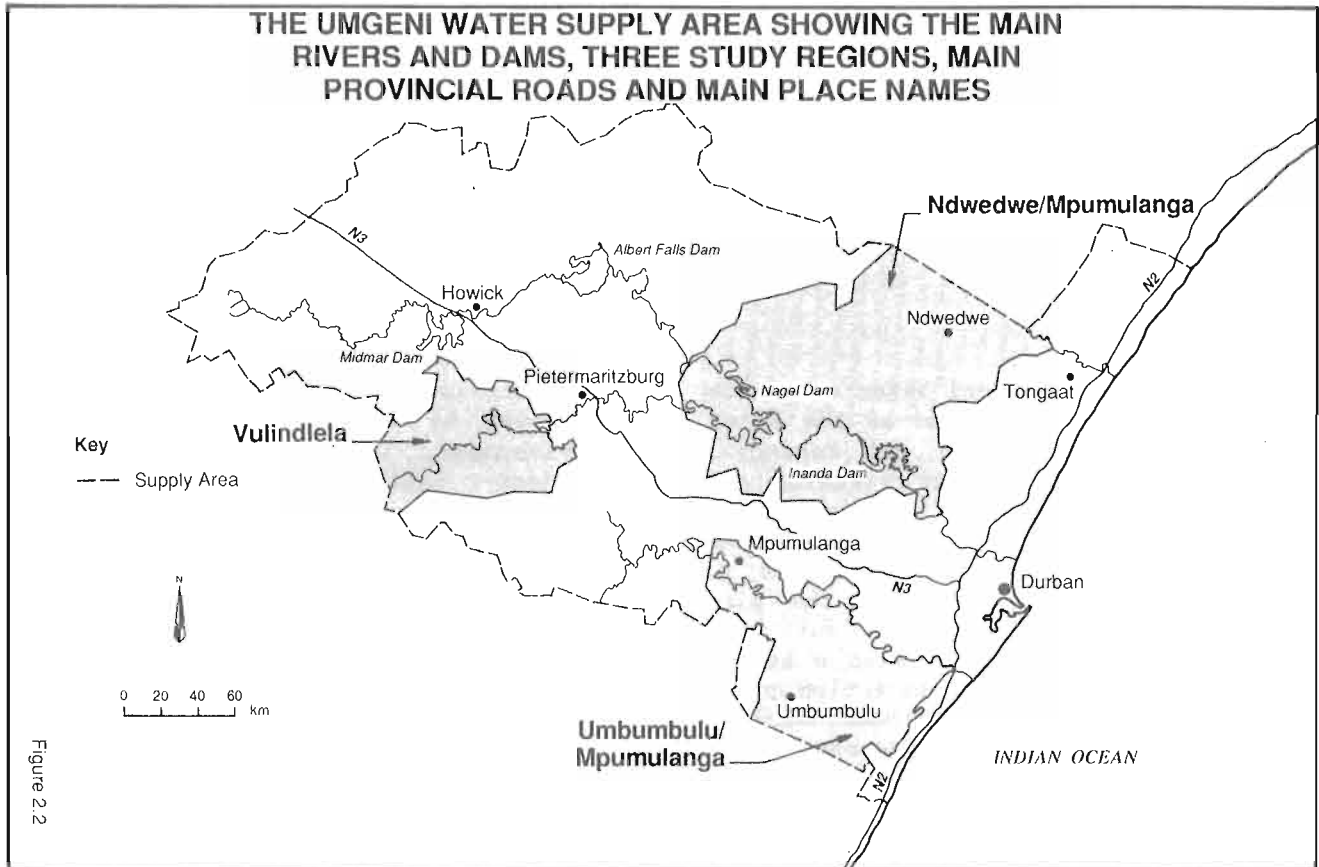
THE STUDY AREA AND ITS CHARACTERISTICS

The study area is illustrated in Figure 2.2 on the following page. The study area was defined, broadly speaking, by taking Umgeni Water's current area of supply and excluding formal farming and township areas and also those areas already being addressed by other bodies. In essence, this leaves the three blocks of KwaZulu located within the Umgeni Water supply area namely, Vulindlela, Ndwedwe and Umbumbulu.

The topography of the study area is generally rugged making the supply of infra-structure costly and difficult. The geology in some areas, particularly Vulindlela, lends itself to good spring locations which encourages the utilisation of these resources. The settlement pattern varies between peri-urban/informal adjacent to the urban conurbations to sparse rural in the more remote areas. A significant feature of settlement in the region at present is the effect of political violence which has caused sudden and mass migrations of communities in many areas. Patterns of settlement and infra-structure follow physiographic constraints to a large degree.

Raw water quality in the rural areas varies between very good in the upper reaches of most catchments to heavily polluted in the lower reaches. The pollution levels relate directly to the density of settlement with *E.coli* counts in some water courses below heavily populated informal areas reaching 120 000/100 ml at times.

The 1985 population of the study area was estimated to be approximately 500 000 and this is expected to double to 1 million by 2010. In the urban areas the percentage of the population aged under 14 is of the order



of 30% but in the more rural areas the same statistic is as high as 50%. In general, the figures for the younger cohort for the study area are low for rural KwaZulu indicating a "semi-urban" type of population rather than true rural.

THE PLANNING ENVIRONMENT

In common with the rest of South Africa the study area is plagued by a plethora of planning agencies. Umgeni Water is in many ways uniquely placed to address the servicing problems of the region in view of its catchment management approach. Nevertheless, no organisation can operate in isolation and, as a result, planning in a meaningful and holistic way is made extremely difficult. It is estimated that there are at least fourteen planning/implementation agencies with some influence in the region and all operating with overlapping areas of hierarchical and geographic responsibility.

There are a number of Non-Government Organisations operating within the study area, these include the Valley Trust, World Vision and the African Co-Operative Agricultural Trust (ACAT). These bodies have achieved excellent results in some areas considering their limited resources. It is considered that better use could be

made of their expertise with a co-ordinated approach and improved financial backing.

A limited scenario analysis was carried out to evaluate the impact of likely future developments on the study area and particularly the RAWSP initiative. The main insights which emerge from the discussion are that; there are high levels of uncertainty in all the key factors which impinge upon the RAWSP, there is wide scope to seize opportunities which emerge as a result of the high level of change, the most critical problem areas are people related rather than technical and finally the two factors which are likely to have the most profound impact in the future are AIDS and political change.

INSTITUTIONAL ISSUES

Under this heading subject matter such as funding, personnel, data basement management, marketing and education were studied.

With regard to funding, the principle of equalisation of tariffs has been accepted as a policy for some years by the Board of Umgeni Water. By its very nature this results in an element of cross-subsidisation from the areas with better economies of scale (urban) to other areas (rural). This

is very much in the spirit of the "New South Africa" (redistribution of wealth) but nevertheless the equally fundamental principle of payment for services in an inviolable part of the RAWSP initiative.

In order to successfully implement the RAWSP, specialist and diverse skills will be needed by the personnel involved. In particular, the importance of social issues means that skills such as communication, education, facilitation and evaluation will be essential. Because Umgeni Water has historically been primarily a "technical" organisation, a new type of culture geared towards the social skills will need to be fostered within the organisation, in particular a joint technical/social issues approach will be a pre-requisite.

One of the main outputs of the RAWSP study has been a Geographic Information System (GIS) data base. This was seen at the outset as the ideal means of representing and manipulating the spatially distributed data emanating from the study. Fields in the data base include topography, cadastra, water sources, population distribution and infra-structure. GIS technology is expensive and the data base will require considerable effort to keep updated. In spite of this, the GIS system is seen as an excellent planning and decision making tool.

Umgeni Water has recognised that a professional marketing approach will be needed as part of the RAWSP programme. It is also clear that there are various stakeholders who have to be addressed in a marketing strategy such as present customers, future customers and donor agencies. These different stakeholders will each have to be addressed with a marketing plan tailored for them.

Educational needs for the study area were assessed with particular reference to the implementation of water and sanitation supply projects. Health education is important to boost demand for services and training in administrative and management skills are essential to ensure sustainability of projects.

PROJECT IMPLEMENTATION AND MANAGEMENT APPROACH

Community involvement in the planning and implementation of rural and informal water supply schemes has been an accepted philosophy within Umgeni Water for several years now. This principle is an integral part of the RAWSP initiative and is formalised in what is known as the Pegasus

approach (Narayan-Parker, T., 1989). This focusses on a participatory rather than a blueprint approach to projects. It implies that institution building is a vital element in ensuring effective and sustainable utilisation of investment in infra-structure. It also places a lot of emphasis on the process of achieving goals rather than working to a formula.

It was recognised at the outset that Umgeni Water's objective of supplying water and sanitation to rural and informal areas would never be achieved by adhering rigidly to formal first world standards. This philosophy reflects economic constraints but also the realities of topography and spatial distribution of settlement within the study area. An appropriate technology approach was thus adopted and, since many of the technologies are well established, a review was carried out rather than attempting to undertake new research. A range of service levels will be provided (where possible) depending on the density of settlement and the socio-economic level of the inhabitants of a particular area. It is thus the intention to provide some freedom of choice allowing people to aspire to improved systems as their income levels increase.

Implementation and management strategies for rural and informal areas were studied and again the principle of community involvement was considered to be a key element. The five phases of project management and maintenance, and evaluation were reviewed with this in mind. The pros and cons of an organisation moving from a reactive to a pro-active posture, ie from a project to a programme imperative were discussed and it is clear that both approaches have advantages and a composite strategy is thus ideal. An example of this is the sound principle of only providing systems to those communities who have made the initial approaches and thus demonstrated their motivation and initiative. However, if this is applied too rigidly, then the economies and benefits of a master plan approach are lost.

WATER SUPPLY PROPOSALS

An analysis of the study areas was carried out to determine the means whereby water could be most effectively and efficiently supplied. Different areas were classified into four categories varying from rural to urban depending on settlement densities and trends. Design standards used varied from 25 to 200 litres per capita per day. These design standards correspond to service levels ranging from standpipes at 500m intervals to house connections with water-

borne sewerage.

Following the analysis of settlement distribution together with existing infrastructure (particularly location of roads), pipeline routes were identified. These were analysed using a linear programme to ensure that routes were optimised on a capital and operating costs. These pipeline routes represent "embryo planning" and will require more detailed analysis on a project specific basis when appropriate at a later date.

It is estimated that approximately 85% of the population can be served by piped water schemes. In a number of areas so-called regional water schemes using local water resources are recommended. This is because the capital costs of extending Umgeni Water's existing infra-structure to these areas is prohibitive. The remaining 15% of the population living in remote and inaccessible areas will be served by spring protection and boreholes. It is estimated that Umgeni Water's objective of a safe water supply to all can be achieved at a capital cost of the order of R170m (\$34M - 1991 prices).

SANITATION SUPPLY PROPOSALS

Sanitation was not studied to the same level of detail as water supply in the RAWSP study. A more detailed investigation of sanitation will thus be necessary in the future.

Although it is the intention to tackle water and sanitation together as part of the RAWSP programme, it is recognised that sanitation supply has a number of characteristics which make it quite different from water supply. Among these are the fact that sanitation supply tends to deal more with family units than communities and the perception by informal and rural inhabitants that sanitation is a much lower priority than water. This latter problem will have to be addressed by an education and marketing initiative.

As was the case with water supply, it is envisaged that a range of sanitation supply options will be needed ranging from Ventilated Improved Pit Latrines through to waterborne sewerage. However, economics dictates that the main thrust will be around VIP's on a massive scale. As far as strategies for sanitation supply are concerned, it is anticipated that setting up local contractors and providing soft loans will be pursued. A major initiative to supply sanitation to schools is seen as a key strategy with important benefits in a

number of areas. As has been mentioned, sanitation will be heavily promoted and encouraged in those areas where water supply is being simultaneously provided.

CONCLUSIONS

Following from Umgeni Water's objective of supplying safe water and sanitation to everyone within its area of supply, the Rural Areas Water and Sanitation Plan provides the framework within which this objective can be achieved. The RAWSP has a strong action orientation but nevertheless recognises that the complexities of services supply to rural and informal areas extends far beyond technical and economic considerations. Aspects such as education, marketing and institution building will thus receive a strong emphasis.

In terms of where the RAWSP leads from here, it is considered that an important next step will be to break the programme down into three five year periods since these will give more accessible and manageable objectives. More detailed studies can then be undertaken on a regional basis of the water supply planning proposals. Detailed marketing/public relations strategies will need to be developed for the three audiences identified. A more in-depth study of sanitation supply proposals will also be undertaken. In the meantime, a number of major water supply schemes identified in the RAWSP are in various stages of planning and implementation, thus underlining Umgeni Water's commitment to its objective.

REFERENCES

1. HORNE, GLASSON and PARTNERS (1989) Water Plan 2025. Report prepared for Umgeni Water, Pietermaritzburg.
2. NARAYAN-PARKER, T., (1989). Goals and Indicators for Integrated Water Supply and Sanitation Projects in Partnership with People. Prowess/UNDP.