



13th WEDC Conference

Rural development in Africa Malawi: 1987

DISCUSSION GROUP REPORT

Hydrology, groundwater location and pollution

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The chairman informed the participants that there was need for all participants to contribute their own experiences.

A. HYDROLOGY

The author introduced his paper and noted that there is little attention given, in most cases, to water resources investigations before the development of water supply schemes when their reliability depends on careful study of the resource potential.

Comments from the forum included the following:

1. There is indeed need to thoroughly investigate the water resources potential of an ungauged catchment but time may be a limiting factor. There is need to visit the supply source area and establish whether it is perennial or not. Rural population in the vicinity should participate in the resource investigation by fully participating and establishing its reliability.
2. The smaller the catchment area the more dangerous it is to estimate through first principles. The model must emphasize the influence of the catchment area. The smaller the catchment the lesser the baseflow even if the parent channel could be resourceful.
3. The model was only a direct estimation guideline by proportion yet as catchment areas need to have a coefficient in estimating runoff therefrom, due to soil types vegetal cover etc. there is equally a need to consider incorporating this aspect in the flow formula proposed.
4. Pumping for abstraction and other influences through the expanse of dambos can produce erratic results when using the model.
5. There was need to consider alternatives of water supply when the water supply scheme should fail in times of severe and continuous drought as had hit parts of Eastern and Southern Africa.
6. Water Supply Engineers tend in most cases to work independently of Hydrologists and Hydrogeologists - this needs to be discouraged.

RECOMMENDATIONS

The following recommendations were passed:

1. Runoff models for an ungauged catchment need to consider and incorporate the influence of dominating catchment area and catchment type.
2. Mathematical models must not be seen to give a complete picture of water resources reliability in any one catchment.
3. As much as possible rural communities must be involved in the resource investigation studies and the resource investigator must visit site of concern before he can do a desk study in estimating resource reliability.
4. There is need for very close liaison between hydrologists, hydrogeologists and water supply and resource investigation studies.
5. There must be close liaison between all relevant government and non governmental institutions in water supply projects so as to guarantee an adequate social, economic and

environmental atmosphere for the planned water project.

6. Pollution monitoring is a 'must' before and after the installation of the water supply scheme.
7. Political leaders at all levels must participate.
8. Social and cultural aspects need to be looked into in the planning stages of the project.
9. Regulations must be enforced to control pollution and overabstraction for a healthy environment.
10. Training must be extended to all beneficiaries of the water supply scheme.
11. Governments must give serious thought to supporting organizations responsible for data Collection being useful input into successful water supply and other water related development projects.

B. GROUNDWATER AND POLLUTION

The chairman gave a brief outline of the groundwater activities in Malawi which he said included the:

- (a) Dispersed Approach - a programme of activities providing quick response to where water is required urgently and
- (b) Integrated Approach- a programme that has to follow well time-tabled operations to cover all work and completed by the design date in an area and includes
 - (i) rehabilitation of boreholes
 - (ii) rehabilitation of wells
 - (iii) maintenance of boreholes
 - (iv) maintenance of wells
 - (v) construction of new boreholes and wells
 - (vi) Establishment of community-based maintenance systems

Groundwater surveys in Malawi were not by drilling operations alone but by resistivity methods as well and provide useful data with existing information for appraising area groundwater resources. The problems faced by the groundwater department include the siting of boreholes where it may be found that the resource is abundant in an unpopulated area and away from inhabited localities. Thus it becomes more difficult to especially force village communities to move to newly constructed boreholes. Such problems even extend to those associated with cultural beliefs particularly when boreholes are located in areas close to cemeteries and yet safe to use.

The deriberations included the following additional comments:

1. Beneficiaries of rural water supply schemes particularly where boreholes are used, usually attach their usefulness to the taste of the water and as such sociologists must initially be engaged to gather information from local communities and reach an agreement with them as to where exactly they would prefer to have their water supply from. Community meetings should be encouraged to involve objectives of the meeting on the planned project for the local inhabitants will usually offer alternatives to new drilling sites.
2. Diseases had from unhygienic water points will prove useful in educating the local communities in using safe water supply sources and train them further to exercise maximum health precautions in using the new water supply alternative.
3. More information on groundwater resources must be gathered by hydrogeologists to reduce borehole siting problems.

4. Hydrogeologists must give high priority to maintenance of boreholes since if these pumps remained unusable for a longer-than-required period, users would return to their traditional water points.
5. Governments should ensure that all boreholes are registered and must include drilled holes by private contractors.
6. Where there was conflict between pit latrines and water supply points initial stages in the planning process must address this problem.
7. There must be adequate borehole designs where the top end of the hole has to be sealed to hold off inter flow from pollution sources. Further to this there is need to look at the type of the aquifer and determine its persimisivivity.
8. Present rural water supply problems must form future water supply planning inputs and must therefore not be repeated.

RECOMMENDATIONS

The foregoing discussions ended in drawing up the following recommendations:

1. A carefully studied water sanitatation programme must complement all water rural and urban Water supply programmes and must in no way be divorced from each other. Water points for animals must be kept away from water supply points for humans. Monitoring of pollution for rural water supply schemes should involve continuous inspection.
2. Training or Health education must be one component fulfilled and carried out from the planning stages of the project to its final stages beyond.
3. Adequate and appropriate borehole designs including dugout wells must be considered in installing the system.
4. Prefeasibility studies in technical and social aspects of rural water supply schemes should be encouraged and should at the same time involve the rural communities.
5. There should always be exchange of information and exchange of visits and experiences in various problems and successes on rural water supply projects among governments in order to avoid repetition or recurrence of any of such undesirable problems in future.
6. The siting, construction and maintenance of rural water supplies should as much as possible include the full participation of the beneficiaries.
7. More research on potential pollution hazards and resource reliablility must form a large part of the project in its planning stages.
8. There should, within each country, be a coordinated water supply development and management programme and that local participation be a cornerstone in implementing a successful water supply project.

The above recommendations were all agreed upon and passed to plenary for consideration.