Transfer of technology from north to south – meeting the needs of a rural environment: a review of the Mtwara-Lindi water project

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Suggests that external inputs and interventions can be beneficial or a waste of resources, depending on many complex factors which are interrelated. Deals with how the approach used in the transfer of technology from an industrialized country to a developing country can be beneficial. The direct involvement of Finnish expertise in a remote region of Tanzania, to improve the water supply, when reverting to grassroots participation, led to positive results. Observes, in hindsight, that giving more space for local initiatives would have led to less dependence on foreign expertise and to faster growth of the indigenous engineering capacity.

Introduction

Mtwara-Lindi is a remote region in southeast Tanzania. There is a clear distinction between wet and dry seasons in this area. Between December and April, 85 per cent of rainfall occurs and precipitation exceeds a minimum of 50 mm[1]. There are several rivers in the area, but only the largest, Ruvuma, has a perennial flow throughout its length. Other major rivers in the area include Matandu, Mavuji, Mbwemkuru and Lukuledi; except for a few small lakes there are no appreciable surface water resources and accurate measurement of groundwater potential has proved difficult[2].

Bilateral development co-operation between Tanzania and Finland started in 1968, mainly in forestry and water schemes. The two governments signed the “Agreement on Technical Co-operation” in 1972[3]. It was one of the twelve water supply projects which donor agencies started in many regions of Tanzania. The rural water supply project of Mtwara-Lindi is supported by Finnwater Consulting Engineers, the Finnish Ministry for Foreign Affairs and the Tanzanian Ministry of Water, Lands, Housing and Urban Development, locally referred to as MAJI. The UK and the United Nations Children Emergency Fund were also partly supportive.

The role of water in any society no doubt contributes to the health of the people. The availability of water in a safe and wholesome form, free from undesirable elements and easily accessible, has been a major setback in many developing countries. Since water is essential for life, clean and unpolluted water is needed on a daily basis for our existence.

This paper reflects on the obstacles that pose challenges in meeting the realities of the region. Despite adequate preparation from the North, without maximum co-operation by the intended beneficiaries a project may not be successful until a reverse approach is implemented that involves them.

Tasks to be achieved

The main activities of the project were envisaged to include the following:

1. Construction of new hand-pump wells and deepening and rehabilitating of existing wells.
2. Extension and rehabilitation of Makonde water scheme and completion of piped water supply projects started earlier by the project.
3. Starting a sanitation and health education programme.
4. Training of personnel.
6. Institutional study to form step-by-step programme for transfer of the project activities and facilities constructed by the project to MAJI.

The objective of this article will be to reflect on the existing situation compared with the expected results of the project and to highlight “native intelligence” and how it has helped to boost external incentives by ensuring harmonious relationships.

External incentives

The rural water supply in the region is based on the use of ground water. The project has been one of the pioneers in hand-pump technology. At the beginning, wells were dug by excavator and drilled by an auger drilling machine; manual methods of hand digging and hand drilling were soon introduced.

During the first years, the annual production of hand-pump wells was as high as 350 to 370 units. At the end of 1985, there were 1,995 hand-pump wells for 450,000 people and 14 piped water-supply schemes for 367,000 people. However, there has been shortage of water distribution due to drying up of hand-pump wells and problems of fuel supply[4]. Rainfall has been poor and the ground water table did not increase at all in the main part of Mtwara, Masai and Nachingwea districts. Therefore, many shallow wells, springs and dams dried up, especially in Masasi and Mtwara districts, leading to a disastrous water shortage.

It was observed that the Regional Water Master Plans (RWMP) are blueprint oriented in the sense that they are prepared by planners prior to and independent of...
implementation activities. The plans specified the future implementation rate until 1991, but apart from that they did not contain the detailed specifications of future activities implied by the blueprint approach[5]. In Mtwara, during a recent survey, it was estimated that only 30 per cent of people have access to an improved water supply. No figures are available for the Lindi region[6]. Therefore, more drastic approaches are required to make water available to more people without major problems.

The piped scheme in Kitangari, Makonde plateau, was referred to as Wärtsilä. The name derives from the time when the huge pumping machinery was transported slowly over narrow roads. Apparently, Wärtsilä was painted across the boxes and the people of this region got used to this name[7].

Getting the people involved

In piped schemes, participation of the community was originally limited to labour hired from villages for trench digging. In the Kitangari and Mbawala Chini-Naliendele piped schemes, trench digging has successfully been achieved on a voluntary basis. The total length constructed so far in Tanzania using self-help labour is about 120 kilometres, which represents a construction cost of about 1.2 million Tanzanian shillings (TAS). The payment was phased out as the scheme progressed because villagers volunteered assistance as they felt confident that they would get water if they helped. Villagers can easily follow the progress of pipe laying, which means that they have time to think about the project before it reaches their village and are therefore mentally prepared for their own involvement in due course[8].

Hand-pump wells

Institutional building, training and community participation activities carried out to increase the water supply have been reported. The target for improving hand-pump water supply as well as the achieved results are shown in Table I.

Table I shows that only 60 per cent of the targets were reached. One of the main reasons was the failure of the districts to allocate funds for the programme. The performance of MAJI and the communities has been rather low, partly caused by financial constraints. Finally, results were affected by floods in spring 1990, which cut off the main roads in the area and hindered all normal activities[9].

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<th>Table I</th>
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<td><strong>Achievement compared to target during fiscal year</strong></td>
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<td>Survey activities</td>
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<td>Construction</td>
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<td>Hand-pump replacement</td>
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Notes: a Total of 85 seismic profiles investigated and 25 geoelectric soundings carried out
b First half of 1988 only, no target figures set

Source: [9]
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In Dar-es-Salaam, Tanzania, were set up training centres under the supervision of the Water Resources Institute in 1987, hitherto referred to as the transition phase in which the actual construction and operation and maintenance activities, were gradually transferred to the local water authorities. The main target was to promote the sustainability of the water supply systems. For that purpose the development of management and human resources and establishment of an effective system of community management for hand-pump wells were aimed at.

A abundant native intelligence was stimulated by exercising patience and attempting to understand the local way of life, to visualize unforeseen problems.

Development has to be thought of as a people's movement, not as a government-funded project. It should be related to values and relationships - things which cannot be bought with government funding. The local population should be made much more aware of the problems, as well as being able to reflect, to experiment with alternative solutions, to educate themselves and to organize themselves, etc. It is not enough to encourage the development of a people's movement, the political dimension cannot be ignored.

Concluding remarks

This article has shown that it is often difficult to transfer technology, as a given package, to a developing country. Complications are bound to occur when the internal factors in this new environment are not well researched and employed to satisfy the intended objective, as shown in the case of Mtwara-Linda rural water project. Once the aspirations of the people are sufficiently stimulated and the will to succeed is sufficient, maximum co-operation with the project is achieved.

References
2. Finnwater, Mtwara-Lindi Water Master Plan, Main Report, annexes A-L (hydrology, ground water resources inventory, hydrogeology, geophysical investigations, administration, population, infrastructure, water supply...
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