

822 INKA91

EVALUATION OF HANDPUMP PROGRAMME IN KARNATAKA

(Sponsored by the Public Health Engineering, Department of Rural Development and
Panchayat Raj, Government of Karnataka and UNICEF)

EXECUTIVE SUMMARY

M. NAGESWARA RAO
Project Director

Institute for Social and Economic Change
Nagarabhavi P.O. Bangalore 560 072

MARCH 1991

822-91-11847

EVALUATION OF HANDPUMP PROGRAMME IN KARNATAKA:
EXECUTIVE SUMMARY

(Sponsored by the Public Health Engineering Department,
Government of Karnataka and UNICEF)

1. Introduction

Water being essential for the survival of life on earth, the focus of attention has now been directed towards this gift of nature. This is especially so, since the advent of what is known as the 'Welfare state' in which the government has undertaken the responsibility of providing "safe drinking water" to the public which is free from contamination. Thus the emphasis is now on 'Safe and Potable' water rather than 'any water'. This naturally gives rise to the question whether the benefits provided by the government have reached the beneficiaries. Mainly the rural communities have been the beneficiaries of this public service and hence this study is directed towards **evaluating** the handpump drinking water supply programme implemented in the state during the past decade.

There is also the need for a continuous and optimum use of these community assets, so that maximum benefit can be derived from it. Therefore, it is equally important to recognize the significance of the proper maintenance of the handpump.

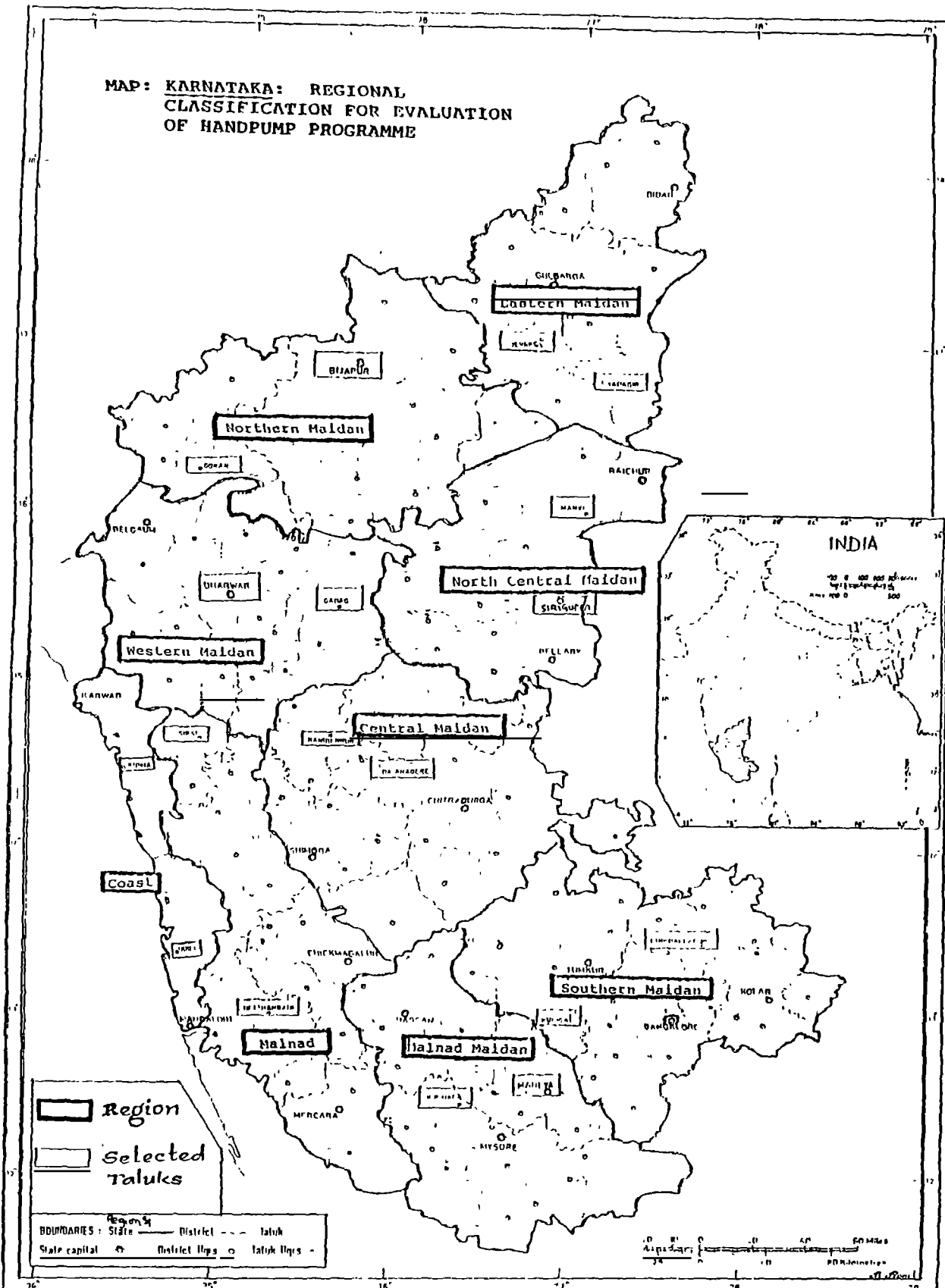
2. Objectives of the study

Keeping in view the above issues, this study is directed towards examining the following objectives:

- 2.1 To examine and evaluate the stages of implementation of the rural water supply programme.
- 2.2 To examine and evaluate the installed, but non-functional handpump sources, reasons for the breakdown, maintenance and repair, alternative systems for maintenance and repair of handpumps;

ISBN 11847
822 INKA 91

MAP: KARNATAKA: REGIONAL CLASSIFICATION FOR EVALUATION OF HANDPUMP PROGRAMME



- 2.3 To examine the progressive development patterns in hygiene and sanitation in rural areas due to the increasing availability of safe water sources;
- 2.4 To assess the status of the management of handpump maintenance system.
- 2.5 To suggest and recommend policy measures, based on the findings of the study.

3. Scope, coverage and design of the study

Keeping in view the objectives, approaches and purposes, this study is conducted in Karnataka state and the handpump programme, which is a major part of rural community water supply programme, is selected for this purpose.

The state is divided into 9 regions (see map) based on agro-climatic, social, regional and political indicators. From these 9 regions, a sample of 18 taluks, and 54 revenue villages, are selected by the method of stratified random sampling design. By adopting the census method, in each revenue village all habitations and all handpumps are covered for the study. For each handpump, one or two household users were interviewed. Thus, the study relates to a total of 167 rural habitations 341 installed handpumps and 570 household respondents.

Three kinds of schedules were used for the study:-

- i) To collect secondary data on demographic and physical characteristics of selected habitations and handpumps.
- ii) To collect physical characteristics of the handpumps by direct observation by the research team, and
- iii) To interview individual beneficiaries of the handpumps.

4. **Status of handpump programme in Karnataka**

In Karnataka, the rural water supply programme is planned, designed and implemented by the Public Health Engineering Department under the control of Rural Development and Panchayat Raj Department. The water supply to rural areas is provided through borewells with handpumps, mini-water supply schemes and piped water supply scheme. The schemes vary depending on the size of the village, water resources and level of financial allocations from various heads of budget accounts.

- 4.1 During 1975-1980, 20,003 villages out of 27,028 were identified as 'Problem Villages' in the State, and about one-third of them were covered with atleast one source of safe water by the end of the Five Year Plan (1980) and the remaining were covered in the subsequent plan periods. In addition, not only more borewells were fitted with a handpump, but also other water supply systems were provided to a large number of villages.

5. **Physical Evaluation of handpumps by Investigators:**

- 5.1 The physical examination of the handpumps in Karnataka by the field team reveals the following (Table 3.1 and Table 3.20):
- (a) 81% of installed handpumps are in functional status.
 - (b) 19% are non-functional, including dried-ups.
 - (c) 22.9% of handpumps give water not suitable for drinking.
 - (d) Adding up (b) and (c) tells us that 41.9% of the handpumps are either non-functional or non-portable handpumps.

Taking into account the above points, it is presumed that the effective adequacy levels of drinking water supply measured in terms of "Population coverage per handpump" gets reduced to 361 persons per handpump from the level of 214 persons per originally installed handpump.

- 5.2 (a) 81% of all borewells sunk in the State are successfully installed with handpumps (Table 3.1 and Table 3.2).

- (b) Three-fourths of the habitations in the State have atleast one handpump installed.
- (c) One-fourth of the habitations, mostly in Coastal and Malnad Coast, do not have borewells.
- (d) Lesser number of handpumps are observed in habitations that are far away from the main villages.

5.3 Statewise population coverage per handpump is as follows (Table 3.3)

- (a) 21.6% of habitations have a handpump for every 100 persons.
- (b) 37.9% of habitations have a handpump for every 100-199 persons.
- (c) 20.3% percent of habitations have a handpump for every 200-249 people.
- (d) 20.2% of habitations are provided with a handpump for more than 250 persons. This mainly happens in Western, Northern and Eastern Maidan regions and in smaller pockets of Coastal and Southern Maidan regions.

It is noticed that the levels of population coverage per handpump are fairly good with less than 200 population per handpump in nearly half of the habitations spread over most of the regions.

5.4 The static water level as recorded by the investigators are as follows (Table 3.9):-

- (a) 59.3% of the handpumps in the State have static water levels less than 10 meters.
- (b) 23.3% have static water levels between 10 to 15 meters.
- (c) The remaining 17.4% have static water levels more than 15 meters.

5.5 The yield rate of borewells, as recorded by the Public Health Engineering Department, shows that (Table 3.11)

- (a) 53,9% of all borewells have a yield of 1000 lph or above.
- (b) 20.7% of borewells have a yield rate between 500-1000lph
- (c) The remaining 25.4% have yields below 500 lph.

- 5.6 The degree of manual effort required to operate the handpump is measured on a 5 grade scale from 'very hard' to 'very easy'(Table 3.13)
- (a) 10.9% of handpumps are 'very hard' and 'hard' to operate, especially in Malnad Coast, Malnad Maidan and Central Maidan regions.
 - (b) 39.9% of handpumps are easy to operate.
 - (c) 49.2% are on the 'average' level of operation.
- 5.7 The physical condition of the platforms of handpumps are as follows (Table 3.15):
- (a) 52.8% of platforms are in good condition.
 - (b) 34.2% require minor repairs.
 - (c) 9.9% of platforms require either major repairs or complete reconstruction.
 - (d) 3.1% of handpumps are without platforms.
- 5.8 Closely related to the conditions of platforms is the water drainage facility given to the handpumps (Table 3.17):
- (a) 41.6% have reasonably good drainages.
 - (b) 33.1% of handpumps require minor repairs to their drainages.
 - (c) 13.8% have bad drainage facilities.
 - (d) 11.5% of handpumps in the State do not have drainage at all.
- 5.9 Water stagnation was found in the surroundings of 50.1% of all Handpumps.
- 5.10 Age wise classification of handpumps indicate that, both platforms and drainages of handpumps installed after 1980 are relatively in better conditions than those installed earlier (Table 3.16; Page 60)
6. Evaluation of handpump and handpump water by users:

570 households are interviewed to find out the water sources available before and after the introduction of handpumps, use patterns of water, repairs and maintenance and their views on new water sources, health habits, views towards cost sharing proposals and environs of handpumps installed.

6.1 The respondents have listed three major problems that they encountered with old sources. These were:-

- a) distance
- b) insufficiency, and
- c) source going dry.

It is noticed that the respondents found physical problems to obtain water more serious than those related to their health. (water borne/water based diseases).

6.2 It is observed that the installation of handpump has improved the quality and quantity of drinking water in rural areas. It has contributed towards improving the health and hygiene of the rural people. For instance, the frequency of taking bath every day has significantly increased from 24.4% of all households before installation of handpumps to 48.8% after installation of the same (Table 4.7)

6.3 83.2% of respondents are positive towards careful use of handpumps and feel that careful operation by the users is the most important aspect to sustain the handpump without breakdown for longer duration.(table 4.10)

6.4 No apparent conflicts were found between different communities on the use of handpumps except in some localised areas.

6.5 The quality of water from handpumps is divided into "suitable" and "non-suitable".

"Suitable" water is sub-divided into:

- a) sweet water
- b) non-sweet (standard) water

and "non-suitable" water is sub-divided into:d

- a) normal
- b) saline
- c) others, which include: unpalatable, bad odour, oily, brackishness, with high flouride contents, etc.

6.6 It is noticed that there is a close relationship between the investigators assessment and users assessment on the taste of water (Table 4.13).

(a) 48.8% of users graded the handpump water as "suitable": sweet (as compared to 47.9% by investigators);

(b) 24.1% reported the water as "suitable": standard.

The only difference appears to be when water was **classified** "nonsuitable"; normal by the people. A large part of this handpump water falls under "suitable" category when classified by the investigators.

6.7. Most of the handpumps are used multipurposely: (Table 4.14).

(a) Water from handpumps used for drinking and cooking purposes alone is 2.5%.

(b) 27.6% of respondents use handpump water for all domestic purposes.

(c) 30.7% use handpump water for "all domestic purpose and for animals".

(d) 39.2% of households have reported that they use handpump water for other than drinking and domestic purposes.

6.8 Regarding overall surroundings of the handpumps, (Table 4.9) -

(a) 56.1% of users reported that in their opinion the surrounding of the handpumps is 'good'.

(b) 32.6% expressed that surroundings were satisfactory.

(c) 11.3% said that surroundings are bad.

On this issue, the investigators opinion was that surroundings as an overall were in a worse condition than as 'seen' by users.

6.9 Despite the close proximity of the handpumps, the old traditional sources are still being utilised. However, majority of the people are now shifting the handpumps, eventhough the old sources are still available, 87.5% of the users feel that the handpumps are convenient and have improved their water requirements, helping them to overcome the age old problems as described in 6.2 (Table 5.9; page 114).

7. **Evaluation of the working status, maintenance and repairs of handpumps by the Community:**

The Zilla Parishad Engineering Divisions are responsible for the maintenance and repair of handpumps. The state provides the necessary funds for this purpose and channelled them through the Zilla Parishads. Karnataka has introduced the two tier system of maintenance and repair of handpumps which consist of a mobile van unit at Taluk level as first tier and village level caretaker for each handpump as the second.

7.1 Asked about the working condition of handpumps, the household members responded as follows (Table 5.1):

- (a) 58.7% reported that the handpumps are in good condition.
- (b) 14.7% found them satisfactory.
- (c) 15.2% found that their handpumps are working with great difficulty.
- (d) 1.3% found the handpumps functioning erratically.
- (e) 10.1% found the handpumps non-functional.

7.2 Agewise classification of handpumps indicate that

- (a) the recently installed handpumps, i.e., after 1980 are found to be falling under 'difficult operation' category.
- (b) Handpumps under the category of 'repair' are also largely of the newly installed groups of handpumps.

7.3 The time taken to repair the handpump was reported as follows (Table 5.3):

- (a) 11.5% of handpumps were repaired within four days.
- (b) 17.9% of handpumps were repaired between 4-7 days.
- (c) 21.9% were attended to between one week to one month.
- (d) 48.7% of handpumps were repaired after one month.

Majority of the respondents are aware of the agencies involved in maintenance and repair, and also the reasons for the delay in repair. The main reason for delay in repair was reported as poor communication between the two tiers (village caretaker and taluk sub-divisions). The system of special messenger or through the caretakers are the major modes of communication to inform when repairs are needed.

From the study, it is also found that the time has come to introduce the concept of payment for the use of the handpumps water in order to contribute to the maintenance and repair. A positive attitude is observed from the respondents. Most of them, across all regions have expressed their willingness to pay for the use of the handpump water. It is found that nearly two-thirds of the rural households using handpumps are willing to pay for it. Again, nearly 68.1% of respondents are willing to pay one rupee a month for the use of the handpump and 25.2% are prepared to pay rupees two per month (Table 5.11).

8. Policy recommendations

The above findings of the study reveal the merits and demerits of the programme and it is suggested that the concerned authorities could now take practical and necessary measures to improve the performance of the handpump maintenance system. Some policy measures that require attention are:

- 8.1 The rural water supply programme may be linked with rural sanitation/health activities. For example, immediate steps could be taken in linking Nirmala Grama Yojana Sanitation Programme with water supply activities.
- 8.2 It is suggested that better coordination between Information, Health, Education, Social Welfare and Rural Development Departments be achieved at state/district levels in order to develop a comprehensive educational/awareness creation strategy using the mass media, the theatres, folk artiste expressions, etc., to reach the rural folk in support of ongoing schemes.
- 8.3 The maintenance and repair of handpumps in rural communities should be retained with the PHE Department, until a proper infrastructure is created at mandal level to enable them to undertake this responsibility. In this direction, the PHED/ZPs should introduce the necessary mechanisms to start training the mandal mechanics and other personnel related to this programme, at mandal/village levels.
- 8.4 Mandal Panchayats should takeover immediately, the responsibility of maintaining the surroundings of the handpumps in a sanitary manner.
- 8.5 The handpump caretaker should be given the responsibility of educating and creating awareness among the users and they should perform their duties voluntarily.
- 8.6 There should be Mandal Mechanics trained by the PHE/ZPEDs who can take care of the maintenance and



repair of all handpumps Mandal-wise at a short notice. For major repairs, the Mandal Mechanic could contact, if necessary, the ZPE sub-division for support. This will greatly prolong the life of the handpump.

8.7 With the users positive response to pay for the services made available, a system of taxation may be attempted in order to make the maintenance/repair of the handpump a self-sustained operation.

*
\$*\$
\$*\$*\$*\$
\$*\$
*



