Handpump standardization in Cambodia

by Bent Kjellerup and Jeremy Ockelford

The large number of different handpumps being used in one country makes the job of the new maintenance authorities unreasonably difficult. This story of standardization should help others facing the same problem.

IN MANY COUNTRIES in the South, rural public water supplies are constructed with the assistance of an external support agency (ESA). Typically, the ESA will provide the capital hardware, which it has usually chosen according to its own criteria. If there is more than one ESA working in the same country, they may all provide different types of pumps, each requiring its own supply of spare parts and maintenance training. Operation and maintenance will then become the responsibility of the user communities and the national authorities, with the particular problem of procuring the many different types of parts from several different countries. One important way to facilitate the operation and maintenance of public handpumps is to standardize and limit the number of types of pumps.

In Cambodia, after the Pol Pot era ended in 1979, there were only a few NGOs and UNICEF working with the national authorities on the provision of drinking water in rural areas. This period was characterized by an emergency relief approach, with little involvement of users in provision or maintenance. Since the signing of the Paris Peace Agreement in 1991, the number of NGOs and donor agencies with an interest in water supply and sanitation has increased rapidly (there are now more than thirty-five), a situation that brings with it the risk that these agencies may all provide different types of handpumps.

But the emphasis of the programmes is changing to a more developmental approach; the world-wide concept of Village Level Operation and Maintenance (VLOM) is starting to be considered, and agencies are beginning to look for suitable pumps.

The problem was analysed by some of the ESAs and by a joint evaluation of the UNICEF and Oxfam programmes which was carried out in June 1992 by International Reference Centre for Water and Sanitation (IRC). IRC's report recommended the standardization of handpumps throughout the country.[1] This proposal was discussed with the national authorities responsible for rural water supply, the Department of Hydrology in the Ministry of Agriculture (DoH), and the Centre Nationale pour Hygiene et Epidemiologie in the Ministry of Health (CNHE), who then asked that the project devise a way to formulate recommendations on which handpumps to adopt as standard.

Reasons for standardization

There are many advantages of standardization:

- The maintenance and the management of maintenance is easier. The number of spare parts is limited, as is the number of training courses for maintenance workers.
- If pumps in the public domain (that is of a non-patented design, which anyone can manufacture) are selected, parts from different manufacturers are interchangeable and so can be obtained from different sources.
- Cost effectiveness is improved, provided the design is not owned by a single manufacturer. Selecting pumps in the public domain will avoid a monopoly.
- Reliability will be improved by using pumps with proven experience. Reliability does not mean a pump which seldom breaks down — rather it is a function of the frequency of breakdown against time to repair. (A pump which breaks down frequently but is quick and easy to repair may be more reliable than one which seldom fails but then takes months to repair when it does).
- The local production of both spare parts and pumps will be encouraged by the greater and more predictable demand for a particular type of pump. Manufacturers can concentrate on producing proven pumps, rather than developing new pumps.
- Third party quality assurance (independent inspection of production) is feasible, with manufacturers working to standard specifications against which they can be checked.

The process

In Cambodia the process leading to standardization consisted of eight steps:

- the development and maturation of the concept of standardization;
- an introductory meeting, including the circulation of a briefing note;

The standardization workshop gave all those working in water supply a chance to contribute their experience and help choose the most appropriate pumps.

- a listing of the pumps for consideration;
- a study of the environment in which the pumps are to be used;
- a meeting of all the organizations with a potential interest;
- the preparation, translation, and dissemination of a discussion paper giving background information on the concept, the environment, and the pumps;
- a workshop in which the pumps can be examined and discussed and recommendations made; and
- the preparation of a report to the authorities giving the recommendations from the workshop.

The final step, the acceptance of the report and adoption of the recommended pumps as standard, is now being taken.

It was very important that all of the organizations involved in water supply in government, industry, the UN agencies, and the NGOs participated in the process. This was to ensure that everybody could contribute their experience and knowledge, be involved in the decision-making, and agree with the outcome.

The introduction of standard handpumps is something which will meet with some resistance from many organizations until the full advantages are understood and felt. In Cambodia consensus was reached only after the issue had been discussed at several Water and Sanitation Sectoral Meetings (a regular co-ordination meeting attended by UN agencies, NGOs, and government departments) and the introductory meeting; the briefing notes and discussion papers had been circulated; and the objectives had been discussed at the workshop. It was found that the early discussions had been necessary to allow the concept to develop and mature.

None of the organizations which initiated the project had the resources to co-ordinate the process, so Danish Church Aid/Lutheran World Service provided the services of a consultant (one of the authors) for a period of three months. This co-ordinator conducted the process with the help of a steering committee made up of members from the Sectoral Group. The committee included representatives from the two government authorities involved in rural water supply, the DoH and the CNHE.

At the start of this three-month project a one-day introductory meeting was held. At this meeting, and in a circular sent out later to organizations that could not attend the meeting, information was requested on agencies' past, present, and future programmes using handpumps. A list of pumps which were to be considered was sent out and agencies were invited to nominate other pumps which they thought should also be considered. One condition was that a sample of each pump had to be available for the final workshop.

One very important issue which arose out of the introductory meeting was the difference between pumps for public water supplies and those for family use. In Cambodia pumps of the latter type have already been designed, manufactured, and installed by entrepreneurs (in one case up to 1500 pumps by one individual!). There was serious concern that standardization would legislate against this type of local initiative, despite it having been made clear that standardization was only intended for public handpumps. The issue was considered of sufficient interest that a section of the final workshop was devoted to discussion of the topic, including the presentation and assessment of a locally made family pump.

Three lift ranges were considered appropriate for Cambodia:

- suction lift, with groundwater levels down to 7m;
- medium lift, for water levels between 7 and 15m; and
- deep lift, for water levels below 15m.

In practice, these ranges are not clearly defined. Rapid draw-down from low-yielding aquifers can convert a suction lift to a medium or even deep lift.

The pumps proposed for consideration were:

- *suction lift range:*
  No.6 (manufactured in Vietnam, Bangladesh, Nepal and other countries)
  Lucky (from Thailand)
  Prey Veng (designed and manufactured by a local entrepreneur);
- *medium lift range:*
  Nira AF 85 (from Finland)
  TARA (from Bangladesh and other countries)
  Dempster (from Thailand and Cambodia)
- *deep lift range:*
  UPM (from France)
  India Mark II and Mark III
  Afridev

Although the Nira is a proprietary pump, it was included mainly because the Finnish Government had proposed to donate some to Cambodia through UNDP. The UPM pump was included because GRET (a French NGO) had

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The same types of pumps are found all over the globe, but standardization within a region will lead to better reliability, maintenance, and cost effectiveness.

introduced it and was modifying it for Cambodian conditions and partial local manufacture, on a trial basis. The meeting had hoped to consider other pumps, but it was not possible to obtain samples, information, or experience of use for these.

Several points came out of this listing process. There are very few pumps in the public domain. There is no pump which allows inter-changeability of parts between ranges; a direct-action pump using the Afridev piston and foot-valve components is not yet available for the medium range, although *Community Water Supply — The Handpump Option* reported in 1987 that such a pump was being developed.[2] The most important source of information on handpumps remains *The Handpump Option*, which was published in 1987 but is now becoming rather dated. There is no comprehensive report of developments and experience since then.

An investigation of the environment included things such as the types, numbers, and maintenance costs of the pumps that were already installed; the groundwater conditions as far as they were known; operating conditions; and an estimate of the future demand for pumps.

To encourage participation by all those involved in rural drinking-water supply, invitations to the workshop were issued to both the central and provincial offices of the national authorities, including the Ministry of Industry, and to UNDP, UNICEF, and other NGOs implementing or planning to implement rural water programmes.

The workshop

The purpose of the workshop was to use the experience and knowledge of all those involved in the sector to select the pumps. The objectives were to:

- agree on a set of handpumps which will be able to meet the requirements of public water supply in rural Cambodia;
- recommend to the responsible authorities that instructions are issued that in future all public handpumps will have to conform with the selected pumps; and
- recommend that similar workshops should be arranged whenever amendments to the standards are found to be necessary.

The workshop did not have the authority to introduce standardization itself, only to recommend to the national authorities that they do so.

A discussion paper was prepared and translated into the Khmer (Cambodian) language to allow fuller participation. It explained the reasons for standardization and gave background information on the existing situation and future environment for handpumps, as well as providing criteria to assist with assessment and a two-page report on each of the short-listed pumps.

A workshop participant presents one model for consideration.

The workshop itself took place over two days and was attended by fifty-two people. It was opened by a Vice-Minister of Agriculture. The proceedings were conducted in both Khmer and English.

The first day re-established the objectives of the workshop and covered the background and environment for handpumps in Cambodia. Each of the short-listed pumps was presented and described, and time was left for questions of information. The whole morning of the second day was devoted to discussion in groups, one for each lift range. Discussion of the family handpump issue was included in the suction range. The groups analysed and discussed each pump in the range and selected the one that was most appropriate.

The final afternoon was devoted to a plenary session of the whole workshop. Each group presented a summary of its discussions and its selected pump for discussion and endorsement by the whole workshop. This session also formulated the criteria for the calling of a similar workshop to revise the standards in the future.

The resulting recommendations were that the No.6 pump be adopted for the suction range, the TARA pump for the medium range and the Afridev for the deep-lift range.

A report on the whole process has been prepared in both English and Khmer and has been submitted to the national authorities.[3]

One assumption underlying the process was that VLOM-status pumps are required. This is a new concept for Cambodia, where pumps have previously been maintained by provincial government teams. Two of the pumps, the TARA and the Afridev, were also new to Cambodia, so both the concept and the pumps will have to be introduced and monitored very carefully if they are to be accepted by the user communities.

The process that has been followed may appear to be slightly cumbersome, but the purpose was to establish the best background for decision-making, and it helped all those involved in the sector to understand how important it is to standardize. When the authorities, as the next step, issue instructions on the handpumps to be installed, it will be based on a consensus of all those organizations involved in the sector.

The whole process has been a learning experience for all involved. ●

References

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