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Handpump
Technology
Network

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Project Document

Handpump Technology Network (HTN) and Interagency Peer Group (IAG)

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Executive Summary

The promotion of low-cost technologies and Village Level Operation and Management of Maintenance (VLOM) has had a profound impact on the implementation of water supply and sanitation projects. VLOM purpose is to give the users a voice in the decision-making process. This can be done by involving the village communities in the planning of their facilities and by letting them choose the technology. They will have to play a major role in the operation and maintenance of the facilities.

The success of the VLOM concept depends on the interaction of institutional, socio-cultural, economical and technical factors. The strategy for the implementation of water supply and sanitation projects that are responsive to the needs and wishes of the users has to entail institutional capacity building matched with sound technological solutions. In community-managed handpump-based water supply projects, the reliability, robustness, ease of repair and cost of maintenance are important factors influencing the willingness of the villagers to take on full responsibility for maintaining the water point.

In November 1992, the International Handpump Workshop held in Kakamega, Kenya, stressed the need for an integrated, user-oriented approach, that takes institutional, financial, social and technical factors into consideration. On the technical side, the need for coordination in handpump research and development was recognised. The workshop proposed a Handpump Technology Network (HTN) consisting of organisations and individuals in the fields of handpump promotion, research and development, manufacture, inspection, and project implementation. The already established Handpump Consultative Group (HCG), comprised of representatives from UNICEF, UNDP/World Bank Water and Sanitation Programme, CRL and SKAT, was to form the core of the HTN.

The scope of HTN will not be limited to research and development work. HTN will also include technical back-up in: formulation of sector policy, institutional capacity building and training, choice of technology, operation and maintenance, cost recovery, strengthening local production capacity, quality control and quality assurance, and dissemination of information.

Today many handpump designs are available in the public domain. Although these pumps are reliable, some technical problems still remain unresolved. Specifications need refinement and continued up-dating. Continued endeavours to resolve outstanding issues are imperative. Research and development work includes design improvements, manufacture of prototypes, field testing and monitoring, and laboratory testing. Data collection, analysis, synthesis and dissemination of findings

needs to be coordinated.

The HTN will become the frame work for all these endeavours to refine pump designs. The main objective will be to coordinate and facilitate research and development on handpumps whose designs are either in the public domain or have potential to be put in the public domain. The thrust will be on improving and fine tuning existing pumps rather than on inventing new revolutionary designs. The results of the work are expected to lead to the periodic revision of the specifications of public domain handpumps.

Initiatives by private manufacturers will be encouraged. A fine balance will, however, need to be maintained to ensure that technical assistance does not unduly interfere with the free market forces.

The HTN membership will be free. The network will be open to all organisations and individuals. The HTN will be a Topical Network for Handpump Research within GARNET.

An Inter-Agency Peer Group (IAG) will oversee activities and be the focal point for the conceptual planning. The already established HCG will form the nucleus of this inter-agency body.

SKAT will be topical network coordinator of the Handpump Technology Network, and will act as the secretariat for the IAG.

The funding requirement for the operation of the HCG, IAG and HTN will be approximately U.S.\$ 240,000.00 per annum. Funding will be solicited from multilateral and bilateral organisations.

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Project Document

Handpump Technology Network (HTN) and Inter-Agency Peer Group (IAG)

1. INTRODUCTION

The development and promotion of low-cost technologies was a key component of the strategy to provide increased water and sanitation coverage to low income communities during the International Drinking Water Supply and Sanitation Decade. The endorsement of low-cost technologies by many sector agencies has had a profound impact on the implementation of water supply and sanitation projects. Many rural water supply and sanitation projects now employ low-cost, appropriate technologies.

If rural water supply and sanitation facilities are to become sustainable it is essential that the users have a voice in the decision making processes of their projects. This can be done by involving the village communities in the planning of their facilities, letting them participate in the choice of technology and giving them both the capability and the responsibility for the operation and maintenance of their water points. The empowerment of women is especially important. Normally women collect water and bear most of the workload. These components are the key elements of the Village Level Operation and Management of Maintenance (VLOM) concept. Due to the backing of VLOM by leading sector agencies the concept is now widely accepted and many rural water supply and sanitation projects are based on the community management.

The success of the VLOM concept depends on an user-oriented approach to institutional, socio-cultural, economical and technical factors. Sustainability can only be achieved through the integration of all these aspects. Water and sanitation projects must be responsive to needs and wishes of their users. They have to combine institutional strengthening and sound technical solutions. The linkage and interaction of all these facets require a technical back-up in areas like:

- formulation of sector strategies,
- institutional capacity building,
- choice of technology,
- operation and maintenance schemes,
- cost recovery concepts,
- improvement of local production capacity,
- quality control and quality assurance,
- dissemination of information.

In terms of handpump-based water supply projects, in which the management of the handpump maintenance is managed by the communities themselves, the reliability, robustness, ease of repair and cost of maintenance are very important factors influencing the willingness of the villagers to take on the full responsibility for the water point.

As a result of the endeavours by several agencies during the last 20 years many reliable handpump designs are now available in the public domain, including the Afridev, India Mark II, India Mark III, TARA and MAYA/YAKU . These handpumps are in use in many countries in Africa, Asia and Latin America. Although these handpumps are reliable, some technical problems still remain unresolved. Public domain handpump specifications need refinement and continuous up-dating. Ongoing efforts to resolve outstanding issues are imperative.

Handpump research and development work includes design improvements, manufacture of prototypes, laboratory tests, and field testing and monitoring of the new designs. To get field performance data which is truly representative of diverse operating conditions it is necessary to field test handpumps in many countries in Asia, Africa and Latin America. Field-tested design improvements can then be incorporated into the existing handpumps specifications. The challenge of refining handpump designs involves many agencies. Monitoring of handpumps in projects spreading over many countries requires a well coordinated effort. The many tasks involved include effective data collection, data analysis, synthesis of results and dissemination of findings.

Private sector participation in handpump research and development is of great importance. However, it must be recognised that the private sector in developing countries operates under various constraints and cannot be expected to resolve all the technical problems alone. External support is needed to accelerate research and development efforts and local capacity building.

In November, 1992, the International Handpump Workshop held in Kakamega, Kenya, stressed that handpump research and development must be oriented to the requirements of the users and the communities. The general consensus was that global coordination and collaboration between external support agencies and other sector agencies is a must; both to avoid duplication of efforts and to ensure optimal utilisation of scarce resources. In technical terms the need for coordination in handpump research and development was emphasised.

Keeping in view the above, the newly constituted Handpump Consultative Group (HCG)¹ on handpump technology was discussed with the participants. The general feeling of the plenary was:

- That the existing informal arrangement was not effective. The HCG has no budget and would have to act on an ad-hoc basis. Therefore, a formal institutional mechanism was recommended to enhance effectiveness.

¹ The HCG is comprised of representatives from UNICEF, UNDP/World Bank Water and Sanitation Programme, Swiss Centre for Development Cooperation in Technology and Management (SKAT) and Consumer Research Laboratory (CRL).

- That research and development should not be perceived as work in isolation; it must be integrated into the overall context of rural water supply, community participation and user needs.
- That the linkages between the ongoing research and development activities in several countries and the HCG will need to be strengthened if this group is to have significant impact.
- That the participants wanted to be assured that the group does not limit itself to issues related to the Afridev handpump. The scope of work should also include other pumps in the public domain (India Mark II, India Mark III, TARA, Maya, Yaku) and, indeed, proprietary design pumps.

The workshop proposed the establishment of the Handpump Technology Network (HTN) open to all organisations and individuals working in the field of handpump promotion, research and development, manufacture, inspection, and project implementation. The already established HCG will form the core of the HTN. The HCG, together with a somewhat larger Inter-Agency Peer Group (IAG), should take on the role of a steering committee overseeing activities. SKAT was proposed as the Network Coordinator and Secretariat.

2. HTN's OBJECTIVES AND SCOPE OF ACTIVITIES

The main objective of the Handpump Technology Network is to coordinate and facilitate resolution of outstanding design issues on handpumps whose designs are either in the public domain or have potential to be put in the public domain.

- **R&D** The thrust of research and development will be mainly on improving and fine-tuning existing pumps, rather than on inventing new, revolutionary designs. The work will be oriented towards making handpump designs more user-friendly, more reliable and better adapted to operation and maintenance by village communities. The results of the work are expected to lead to the periodic revision of the specifications for public domain handpumps .

The scope of the work will, however, not be limited to research and development. Through collaboration and the exchange of views amongst members the HTN will influence sector policy decisions. On request from implementing agencies, HTN will contribute the technical back-up to decision-makers in order to allow them to make informed decisions on sector policy. It will actively participate in the elaboration of studies covering technical, institutional, financial and social aspects of water supply. The objective of this work is to devise sustainable strategies that are institutionally sound, technically realistic and responsive to the needs of the users. The following specific points will be considered:

- Choice of technology,
- Procurement procedures,
- Local capacity building in production and training;

- Quality control and quality assurance;
- Operation and maintenance systems,
- Provisions of spare parts,
- Cost recovery concepts,
- Private sector participation,
- Dissemination of information.

The HTN will encourage initiatives to resolve outstanding design issues among private sector manufacturers. A fine balance will, however, need to be maintained to ensure that technical assistance does not unduly interfere with market forces.

The HTN will become the framework for the implementation of research and development activities. Resources for technical assistance will be optimally utilised through coordinated and concerted efforts. The specific Terms of Reference for the HTN are attached in Annex I. Funding for Handpump Technology Network will be solicited by ESAs so that it can be put on sound financial footing which will enable it to work on a long term comprehensive programme.

3. PARTNERS AND CONSTITUTION

3.1 Handpump Technology Network (HTN)

The HTN membership will be open to all organisations and individuals who are active in the field of handpump development and/or promotion, and to agencies implementing rural water supply projects with handpumps. This will include multilateral and bilateral agencies, governmental organisations, NGOs, private sector handpump manufacturers, research and development groups, inspection agencies, and individuals.

Membership in the HTN will be free. However, each member will have to agree that all results from research and development activities undertaken within the HTN framework shall be freely available to all other members.

The HTN will be a Topical Network for Handpump Research within the framework of the Global Applied Research Network for Water Supply and Sanitation (GARNET). The inclusion of the Handpump Technology Network in GARNET will facilitate the dissemination of information on a wide scale. Annex IV gives basic information on the goals and objectives of GARNET.

Ongoing handpump technology research and development activities, such as the agreements between UNDP/World Bank Water and Sanitation Programme and SKAT (financed by SDC), CRL research and testing projects (financed by ODA), UNICEF and DANIDA projects will be fully integrated into the HTN. These will form the basis for the initial activities of the network. These activities will be complemented by the activities of the expanding network partnership.

3.2 Inter-Agency Peer Group (IAG)

The formation of the IAG will help to achieve the networks aim of better coordination. It will become the focal point for conceptual planning.

The Inter-Agency Peer Group of the HTN will include:

- Representative of UNICEF
- Representative of UNDP/World Bank Water and Sanitation Programme
- Representative of SKAT
- Representative of CRL
- Representatives of government R&D programmes
- Representatives of bi-lateral donor agencies
- Representatives of NGOs
- Representatives of independent inspection agencies
- Representative of the Association of Handpump Manufacturers (if constituted).

Membership of an agency in the IAG will be by invitation only. The already established HCG will form the core of this inter-agency body. Members of the IAG will be active agencies which are committed to the use of handpumps in rural water supply. Initially, the HCG will extend invitations to organisations/individuals for membership in the IAG. After the IAG is constituted, it will then decide its future membership composition. The membership, unless extended, will be for a period of two years.

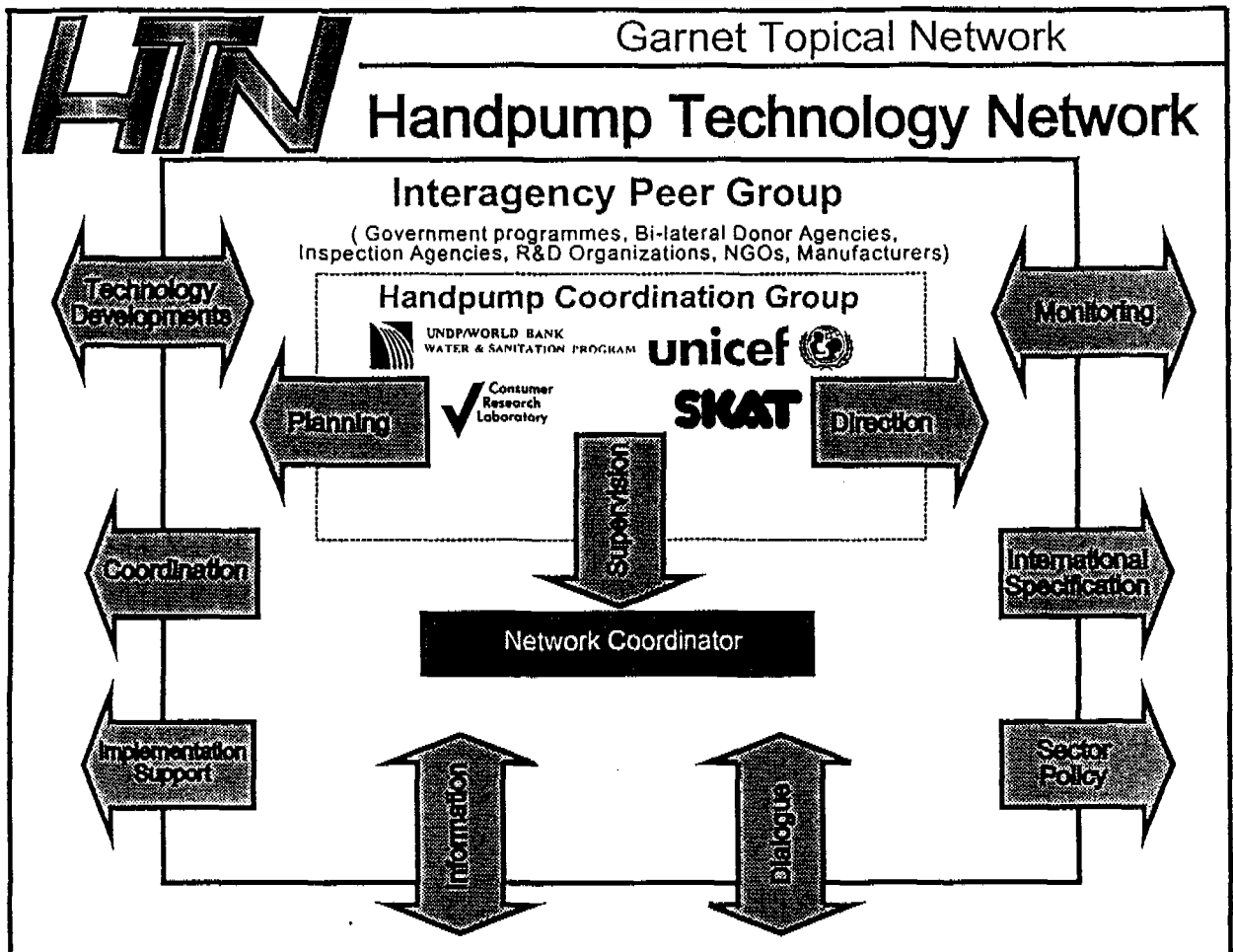
The IAG of the Handpump Technology Network will normally meet once a year and will be responsible for the following:

- Conceptual planning of the Handpump Technology Network (HTN);
- Guidance and support to the HCG and the network coordinator;
- Organisation of an international handpump workshop every 3 years and regional workshops whenever appropriate;
- Periodic review of the constitution of HCG and IAG;
- Constitution of committees and working groups for specific tasks.

3.3 Handpump Consultative Group (HCG)

At present the HCG is comprised of representatives from UNICEF, UNDP/World Bank Water and Sanitation Programme, SKAT and CRL. The constitution of the HCG will be reviewed periodically. The HCG's representatives are selected from among the members of IAG. They form the core group of the IAG. In addition to their responsibilities within IAG, they shall have the following functions:

- Preparation and approval of the annual HTN work programme and budget;
- Directing and supervising the executing agency;
- Determining financial responsibilities;
- Supervising budget spending;
- External representation of the network.



3.4 Topical Network Coordinator and Secretariat

SKAT will be topical network coordinator of the Handpump Technology Network and will act as the secretariat for the IAG.

The HTN's Coordinator's scope of work and authority will be defined by the Handpump Consultative Group (HCG).

The topical network coordinator will provide annual reports to the Handpump Consultative Group (HCG) and the Inter-Agency Peer Group (IAG) on work done and progress made. The topical network coordinator will keep detailed accounts of funds spent on behalf of the Handpump Technology Network (HTN). The accounts shall be audited yearly by the approved chartered accountants.

3.5 Private Sector Participation

Private sector participation in design refinement will given high priority. This will be achieved through close collaboration between the HTN, the manufacturers and the inspection agencies. The HTN will encourage and support research and development initiatives by manufacturers in the private sector.

4. WORK PROGRAMME

The HCG has prepared a detailed work programme for the first year, attached as Annex III. In future, 3 year work programmes shall be worked out by HCG for approval by the IAG.

5. FUNDING

The annual funding requirement for the operation of the HCG, IAG and HTN will be approximately U.S.\$ 240,000.00 It is expected that SDC would finance a portion of SKAT's activities under the cooperation agreement with the UNDP/World Bank Water and Sanitation Programme. This core-financing will provide about 30% of the overall budget. The balance funding will be solicited from multilateral and bilateral organisations. It is anticipated that support from various sector agencies will be forthcoming.

The Budget is attached as ANNEX II.

TERMS OF REFERENCE FOR THE HANDPUMP TECHNOLOGY NETWORK

The Terms of Reference for HTN shall be as follows:

a. **Clearing House of Information:**

Country level initiatives will be the mainstay of all research and development work. The HTN will collect data of what is going on in the field and in the regional or country programmes. It will share the information with other programmes and projects in order to keep them up-to-date with the developments.

This will be achieved by the topical network coordinator facilitating close contacts with experts and organisations working in handpump development, testing and production.

b. **Advisory Function and Advocacy Support:**

The HTN will provide the technical back-up to decision-makers in order to allow them to make informed decisions on sector policy. It will make the necessary information available for the elaboration of strategies that are sustainable for:

- Institutional issues and capacity building,
- Choice of technology,
- Procurement procedures,
- Local capacity building in production and training,
- Quality control and quality assurance,
- Operation and maintenance systems,
- Provisions of spare parts,
- Cost recovery concepts,
- Private sector participation,
- Dissemination of information.

The HTN will provide conceptual planning of technical assistance and technology promotion in handpump-related issues.

The HTN will point out training needs and facilities.

To ensure that the scarce funding available for research and development is spent in the most effective way the IAG of the Handpump Technology Network will identify priority areas for research and development. This will be done in close consultation with the organisations in the field.

c. Coordination:

The IAG will coordinate, facilitate and to a limited extent initiate research and development activities. Coordination will be done through the close link between the field testing and the laboratory research. Limited funding will allow the production of prototypes if new promising ideas come up.

The coordination will be done through linking the country programmes, national projects and bilateral projects in the different regions.

d. Global Monitoring:

New design features: The Handpump Technology Network will collect field results from projects that are testing experimental handpumps or that are field testing new design features of pumps. The IAG will coordinate these activities. The data will be processed and analyzed in a structured and methodical manner. The feed back from testing all over the world will allow to generate solutions which are globally applicable, but will also take the different operating conditions in the various countries into consideration.

The HTN will:

- collect the data accumulated by the test projects,
- enter them into the computer database and produce comprehensive analysis outputs,
- maintain close contact with all test projects in order to ensure maximum cooperation in the data collection.

Constant exchange of the results with the partners will facilitate this coordination.

The monitoring of handpumps under VLOM conditions: This testing will assess not only the technical performance of pumps but also their inclusion in the economic and social context. The field-tests will provide field data which will enable the analysis of technical, financial, institutional and social aspects. The international nature of the project will for the first time create data in large quantities that is comparable and can be evaluated, analyzed and synthesised.

HTN will select a suitable computer software for the database and initiate the preparation of the customised database programme.

HTN will be writing, editing, printing and distributing of yearly report on the performance of the tested pumps.

e. Implementation Support:

The HTN will support efforts to set up local/regional production of pumps by:

- Collection, evaluation and dissemination of information on production procedures and manufacturing technologies.
- Provision of specific inputs into quality control and quality assurance procedures.
- Assistance in preparing and defining quality standards and formulating quality control procedures and quality assurance mechanisms.
- Identification and possible training of quality control inspectors and agencies to carry out quality control at the local level.

f. International Specification:

The Handpump Technology Network will provide the technical back-up to SKAT as the convener and publisher of the international specifications for all handpumps in the public domain, i.e. Afridev, TARA/MAYA/YAKU, as well as to national standard boards which publish specifications based on the India MarkII/MarkIII.

The Afridev, TARA/MAYA/YAKU specifications will be published in collaboration with the Handpump Technology Network. The Handpump Technology Network will appoint the committees responsible for the periodical revision of the specifications.

g. Communication

The Handpump Technology Network will use existing means of communication to keep its members informed of all activities.

- Biannual up-date on the Technology Networks activities in the UNICEF publication, "Waterfront";
- UNDP/World Bank Water and Sanitation Programme's periodical "Newslines";
- Information through the SKAT Newsletter "Doppelpunkt";
- Workshops or meetings similar to the Kakamega workshop, approx. every three years, to allow an intensive exchange of views and opinion.

- The HTN will solicit support from multilateral/bilateral donors to host the workshops. The cost for hosting a Workshop would be approx. \$ 20,000.00.
- As for the Kakamega Workshop individual members (multilateral, bilateral donors) of the HTN will be requested to sponsor the participation of members who can not afford to pay for their participation in full. The HTN will have only very limited funds for exceptional cases.

d. Implementation Support:

The HCG members will maintain their support to local/regional production of handpumps by: dissemination of information on production procedures and manufacturing technologies, provision of inputs into quality control and quality assurance, preparing quality standards.

Timeframe: Starting June 1994, ongoing

e. International Specification:

During this period SKAT will publish the international specification of the Afridev handpump Rev2-1994. This publication will be for the first time issued also in the name of HTN.

Timeframe: October 1994

f. Communication

The HTN will keep its members informed of the ongoing progress by publishing an article in the UNICEF publication, *Waterfront*.

Timeframe: Starting June 1994, ongoing



GARNET is an initiative of the Water Supply and Sanitation Collaborative Council and was set up to improve the flow of applied research information in the sector among institutions and individuals, between researchers and programme implementors and between industrial and developing countries.

Another advantage of networking is that it extends the possibility of working with other researchers. Collaboration between institutions in industrial and developing countries is already common as several papers presented at this Conference show. More joint efforts could be encouraged by networking.

Yet another benefit can be avoidance of duplicated effort. Too often there are several researchers doing more or less the same thing. Too often research can be criticised for 'reinventing the wheel'. It is far better if investigations can build on what others have done.

Within the global network there are about thirty topics, each with a coordinator. The following list gives the broad categories covered; some, like handpumps, have more than one coordinator, each dealing with a different aspect of the topic.

GARNET topics

Eutrophication
 Groundwater pollution
 Guinea worm eradication
 Handpumps
 Housing and health
 Hygiene behaviour
 Health impact assessment
 Infrastructure for housing

Institutional development
 Latrines
 Participatory monitoring
 Rainwater harvesting
 Separation processes
 Social science research
 Solar distillation
 Solar disinfection
 Solar disinfection
 Solid waste recycling
 Toxic substances
 Waste management
 Wastewater reuse
 Wastewater treatment
 Water (unaccounted for & efficient use)
 Water treatment

Those actively involved in applied research are urged to join GARNET. I will be pleased to answer enquiries and to put enquirers in touch with the appropriate topic network coordinator.

Part of the preliminary research undertaken by WEDC was funded by a research contract with ODA, whose support is gratefully acknowledged with hopeful anticipation of backing for the next phase of the investigation. ODA is also funding operation of the GARNET Global Network Centre at WEDC.