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Human Resources Development in the Water Sector



*Initial Issue Paper for Discussion and
Review*

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Introduction

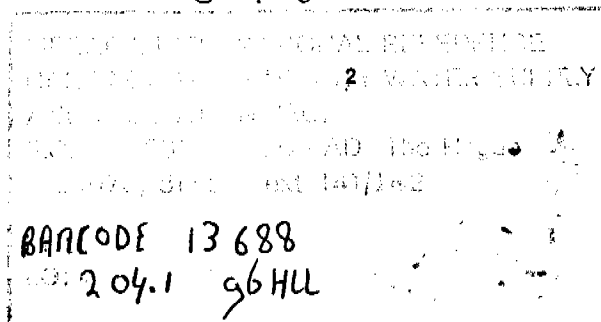
The Water, Waste Management and Aquatic Environment Programme located in the Sustainable Energy and Environment Directorate (SEED) at the United Nations Development Programme has prepared this paper in order to facilitate development of a strategy for human resources development (HRD) in developing countries. Particular attention is paid to the needs and requirements of two major water subsectors, water supply and sanitation as well as irrigation and drainage. This paper is meant to assist developing countries, UNDP, UN specialized agencies, development banks and others to address the critical issue of human resources development (HRD) needs in developing countries.

During the October, 1995, meeting of the Water Supply and Sanitation Collaborative Council, it was decided to create a Task Force on Human Resources Development, coordinated by UNDP. Furthermore strong interest in the issue of HRD was expressed by the ACC subcommittee on Water Resources during its September, 1995, meeting. As a consequence, UNDP proceeded with the preparation of this issue paper.

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Background

A number of international meetings, organizations and individuals have noted the need for human resources development. With the growing number of people globally and the finite amount of available water, the need for sustainable approaches which involve and address all stake holders becomes increasingly important. The importance of delivering good quality water supply and sanitation to the developing countries is self evident if the health and economic development of countries is to progress.

Delivering good quality water means increased partnerships, particularly with the agricultural sector. Growing scarcities means a renewed focus on utilization of wastewater reuse and other methods for increasing food production. Since agricultural practices traditionally use the vast majority of water (70% to 90%), meaningful change requires increased collaboration and problem solving. It is important that the different water and related sectors (e.g., agriculture, industry, energy) understand and interact with each other concerning the best solutions through education and training.

To work towards water management that will lead to water savings, reduced pollution and increased productivity of water, we need individuals with skills which combine science, engineering, management, communication, economics and community outreach. Effective water professionals must be given learning skills and resources to deal with new and evolving complex issues and perspectives. The importance of success can not be overstated. This means that water professionals must become more inclusive across gender and socioeconomic groupings.

The Cairo Conference concluded that the education of girls is an essential step towards empowerment of women which is the primary condition for population control and public health. It is also believed that education and empowerment of women is an important condition for sustainable and wise use of resources and preservation of a solid resource base for future generations.

Some of the issues currently facing water professionals are how to ensure both men and women are recruited into water sector professions, how to increase the ability of all professionals to deal with water sustainably and holistically, how to address the multiple skills needed professionally, how to address the vast recruitment and adaptive training needs that exist now and in the future, and how to include human resources development as a fundamental action, not as a side issue. Consequently this paper covers the formative primary and secondary school years, vocational training, professional (university) training and post-graduate continuous learning.

Formative Years

Waiting to address these issues until an individual is in college or vocational school is not sufficient to make meaningful change. Encouragement of water literacy and involvement with the environment in the primary and secondary school years is critical. Water resource and environmental issues should be incorporated into science

and non-science classes alike in order to guarantee all are reached. For example this can be done in simple ways such as game playing around the theme of watershed protection or a social science debate over how much water should be used for irrigation, industrial and domestic use.

Reaching children in a broad manner allows for numerous objectives to be met. Teaching the importance of water and the environment from various perspectives helps to ensure a public that is supportive of sustainable policies. There is a need to create a new "water and environmental consciousness" so that society at large becomes aware of the necessity to use and manage water in a sustainable manner.

Teaching and knowledge of the entire water continuum and how it interconnects with the environment will assist in arriving at rational policies. A meaningful dialogue between water sector professionals and the affected communities is difficult, if not occasionally impossible, without an educated understanding of the issues from both a professional and community perspective.

If women are to be recruited into the water sector, as well as other environmental professions, they need to gain an understanding of water sector issues at an early age. Learning about water resources and the environment in a relevant manner through such activities as water testing, water basin protection and sustainable methods of irrigation will assist in lessening barriers and promoting the dialogue needed between all sectors of the population.

Fortunately a good number of educational materials already exist and for the most part, have been enthusiastically received in the schools where they have been used. One issue appears to be getting relevant materials to the many schools that do not currently have them and then helping the teachers shape and incorporate these materials in a way that is most useful for their communities.

A good environmental program in the schools should not be meant to preclude informal educational opportunities in the community. Water sector and environmental publicity campaigns via the mass media, distribution of educational materials outside of the schools and creation of ecological awareness centers are all additional tools. Partnerships between water utilities, the agricultural community and schools can vastly benefit all involved.

Vocational Training

For many vocational training rather than a university education is an attractive choice. It allows development of a trade or skill that is useful and should help to increase the individual's chances for employment. Vocational training is more accessible and requires shorter time invested than a university education. However, it still may not be accessible enough.

A particularly wide variety of vocational training must be available since trainees can range from graduates to illiterates, comprising both men and women. Among them there will be variations as to age, education, occupation, social background, etc. To the extent possible, vocational training should be linked to the extension of sites

where water sector projects are being developed and operated. Addressing poverty and gender needs may necessitate more on site training be done since many trainees, particularly women, may not be able to leave their families to go to a remote school.

Even if the training is brought to the doorstep, it must be relevant. A major issue with the training of today's technicians is the lack of relevant training and the inability to update skills. Good technicians need specific training in practical technical work as well as in supervising and directing personnel which could later be their jobs.

Successful models exist such as one provided by Tanzania where technicians were interviewed by teachers to more accurately see what types of tasks needed to be performed, what they needed to know and do, and what tools they use. An interactive approach resulted in more responsive vocational training.

However, taking this one step further it is necessary to also allow growth into the future. How can technicians not only learn about what is needed today but how they can meet the needs of tomorrow. Presently a heavy top down system is usually in place which may frequently minimize effective solutions being enacted.

New partners need to be sought. Water resources needs are increasingly involving the private sector. It is important to bring them in as a partner in training. They have a vested interest in having well trained technicians that can meet their goals and may well be able to invest capital into reaching those needs.

Increased use of trade and associations and farmers groups in training provides insights into the vocation as a whole as well as allowing networking opportunities for the skilled technician. Being able to discuss issues with one's peers is a positive step towards problem solving. Isolation is usually not a productive alternative.

Lessons from utilities need to be incorporated. There are numerous types of utilities who have developed different on the job training modalities. These experiences and materials need to be shared and built upon. These lessons are not only important for vocational training but also need to be examined in the context of the university.

University and Professional Training

The true challenge of the university is to create professionals that have the ability to understand water resources in its entirety. We must effectively provide relevant education for professional practitioners if water resources are to be managed sustainably.

The types of questions facing us today such as global trends in climate change and the concomitant impact on water, increasing pollution, aging of water resources facilities, less and less water available for irrigation, food security, risks of resource development and economic pressures facing limited resources can not be handled from a narrow educational approach.

Water sector professionals need to know how the topic they are focused upon (e.g., irrigation or sanitation) impacts other aspects of the water sector (e.g., drinking water

or food supply) or other media (e.g. water emissions impact on air quality or fisheries). The issue is to connect the ever widening needs of professionals in the water sector with relevant professional education and training. Reflecting current and future needs is the challenge.

Once university or pre-university students decide upon a profession in the water sector, they are usually routed into one of a number of educational paths that usually tend to treat water from a narrow single focus approach. While universities everywhere have difficulty keeping up with all of the new issues facing water sector professionals, the developing world has special challenges. These include reduced public funding, deteriorating facilities, lack of autonomy, insufficient and unresponsive research capacities, insufficient effort to incorporate indigenous knowledge and approaches, lack of opportunity for women and inadequate preparation of the entering student.

This can be still further compounded by underpaid and sometimes ill trained staff who lack career opportunities, incentives, academic freedom and access to the latest information. Often teaching is exclusively rote oriented where a set lesson is delivered by lecture and then tested on memorization of that lesson. Lessons may only cover a few narrow subjects that do not examine linkages. This can eliminate or minimize development of problem solving skills which are sorely needed in order to learn sustainable water sector approaches and problem solving for the future.

To accomplish meaningful change a number of steps are needed. Building the capabilities of universities as well as other learning institutions to meet the real needs of the water sector practitioners would greatly assist in giving the professional the skills and tools they need to meet challenges. Assessing needs of the country and then developing increasingly inclusive approaches would allow numerous relevant subjects to be learned and taught in the most responsive manner possible to the greatest diversity of people.

New roles for teachers and researchers should be encouraged. One solution may be "job swaps" where selected practitioners may be brought into universities to teach while at the same time researchers are rewarded for working in the field and doing their research in conjunction with the practitioner in the water treatment plant or the farmers.

Different promotion criteria for teachers may need to be considered that would place the need of practitioners in a prominent position. Requirements of community outreach and projects as well as field work in several aspects of water sector management could be required.

Encouragement of alternative education such as long distance learning, increased use of the Internet, increased involvement of the private sector to fund university posts as well as field work, increased utilization and formation of professional societies, coop requirements for graduate school that involve community involvement, development of communication, financial and management skills all need prominence.

Ongoing Continuous Learning

To be an effective professional means continuous learning. It is not possible to view university degrees as the ending of one's education. It is more accurate to view it as the beginning. Information in today's world has increased dramatically as have the challenges facing us in the future. Ending education and training at graduation guarantees getting stuck in the present or even worse, in the past. Yet rare is the workplace that provides ongoing skills to their employees. This has to change.

Reimbursement of costs for continuous education has to be factored into the price of water. Training should be factored into promotion. Increased use and development of utilities or professionals should be encouraged and fostered as another means of developing and supplying pertinent training materials.

Through the years many good training programs have been developed which cover numerous aspects of water resources management. What is lacking is a good inventory of resources and availability. With the availability of the Internet, an international resources training directory would be a step towards duplication of already useful materials and availability of information to the greatest numbers of people.

Towards a Strategy of Sustainability in Water Resources Training and Education

A number of substantive papers on the topic have been written. Appendix 1 contains some relevant background papers as well as a selected bibliography. This paper is being distributed to the list of people in Appendix 2 with a request for comments and information. A further request is made for names of relevant individuals interested in this issue who would be willing to contribute their perspective.

After comments are received, a representative group from developing countries, field practitioners, international training centers, universities, UN agencies, development banks and professional associations will be organized. Focus groups of expertise will be asked to address their components and bring back their recommendations to the entire group.

It is important that representative groups are included so "buy in" and ownership of the ideas are maximized. It is critical that a meaningful strategy leading to projects and programmes done in full partnership with other organizations and participants. The future of water resources depends upon having the best trained and educated people available.

Selected Bibliography

- Alaerts, G. J., T. L. Blair and F. J. A. Hartvelt. 1991. *A Strategy for Water Sector Capacity Building*. IHE Report Series 24. Delft.
- Alaerts, Guy J. 1996. *Capacity Building: A Novel Approach - Purpose and Instruments*. Paper presented at the Stockholm Water Symposium, Stockholm, 5-8 August, 1996.
- ASCE Task Committee on Water Resources Education and Training. 1990. *Perspectives on Water Resources Education and Training*. Journal of Water Resources Planning and Management, Vol.116, No.1, pgs. 99 - 133.
- Botswana Ministry of Education. 1994. *Work with Water - A Guide to Careers*. Gaborone, Botswana.
- Buras, Nathan. 1991. *The Need for Education and Training in Geosciences for the Development of Third World Countries*. Water International Journal, Volume 16, pgs. 59-63.
- Hartvelt, Frank. 1996. *Capacity Building Programme for Sustainable Water Sector Development*. Paper. United Nations Development Programme, New York.
- International Symposium Proceedings. 1991. *Hydrology and Water Resources Education Training and Management*. Chihuahua, Mexico.
- Janssens, Jan G. 1994. *Applied Research and Human Resources Development for Improved Services in Water Supply and Sanitation*. Paper presented to the Seventh Congress of the Union of African Water Suppliers, Dakar, Senegal, 1-4 February 1994.
- McBean, E. A., Mitchell, B., and Mulamootil, G. 1987. *Canadian Education and Research for Water Resources Management*. Water International Journal, Volume 12, pgs. 170-175.
- Savenije, H. and Blokland, M. 1996. *Capacity Building Through Higher Education and Training*. Draft Paper. International Institute for Hydraulic and Environmental Engineering, Delft, The Netherlands.
- Srinivasan, Lyra. 1990. *Tools for Community Participation*. United Nations Development Programme, New York.
- Stockholm Water Symposium Proceedings. 1994. *Integrated Land and Water Management Challenges and New Opportunities*. Stockholm, Sweden.
- World Health Organization. 1982. *Basic Strategy Document on Human Resources Development*. Geneva, Switzerland.
- World Health Organization. 1995. *Guidelines for Planning Training Activities for Immunization and Disease Control Services*. Geneva, Switzerland.
- World Health Organization and the Swedish International Development Authority. 1989. *Training Programme Gets a New Profile*. Geneva, Switzerland.

Request for Information

Those who are interested in contributing to this Issue Paper are kindly requested to:

1. inform us of any corrections or additions to names, addresses, phone and fax numbers as well as e-mails,
2. provide a synopsis of your activities concerning HRD;
3. recommend documentation to be included in the bibliography; and
4. contribute names of other relevant individuals interested in this issue who would be willing to contribute their perspective.

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