

Capacity Building for the Water Sector in Mexico: An Analysis of Recent Efforts

Cecilia Tortajada, Member IWRA, Third World Centre for Water Management, Atizapan, Estado de Mexico, Mexico

Abstract: *Present and future improvements in efficiency of the water sector in Mexico depend on the development of a cadre of well-trained professional managers in the public and private sectors, as well as on the strengthening of the private and public sector institutions. Considerable investments are needed, but the efforts will pay back in terms of more rational policy-making and management practices. This paper analyses several important exercises on capacity building in Mexico, which took place during the decade of 1990-2000. Present efforts on capacity building, achievements and concerns, are also considered in terms of the training and education needed to build a new generation of water professionals who can meet the current challenges and the needs of the coming decades. The needs of the water sector in terms of capacity building have been assessed in Mexico several times in the past. The conclusions and the results have always been the same: there is an urgent need to develop better educated managers and water professionals, both in terms of numbers and skills. Even though the needs have been identified repeatedly for over a decade, and despite of continuous official rhetorics on the importance and urgency of capacity building, no long-term country-specific programme on capacity building has yet been developed, let alone implemented.*

Keywords: *Capacity building, Mexico, water management, water resources education, training programs.*

Introduction

Integrated water resources management is promoted globally as a requirement for countries to achieve sustainable water development. One important means to manage effectively the water resources is to build the capacities of the concerned institutions, managerial systems and human resources (Alaerts, et al., 1991). National capacity building programmes include the updating and implementing of policies, institutional strengthening, and development of human resources, at local and national levels.

The concept of capacity building was recognized as a priority item at Mar del Plata (Biswas, 1978), even though during this United Nations Water Conference in 1977, the term capacity building did not exist. The emphasis at Mar del Plata was on human resources development in terms of education, training, and research (Recommendation F), and institutional strengthening (Recommendation D), all of which are now considered as integral components of the capacity building process. The UNDP Symposium on capacity building for the water sector, convened in Delft in 1991, defined capacity building as having three elements: an enabling environment with appropriate policy and legal frameworks; institutional development, including community participation; and, human resources development and strengthening of managerial systems (Biswas, 1996a).

Capacity Building In Mexico

In Mexico, the overall framework for water management has been established mainly in terms of legislations and institutions. Decentralisation has been promoted for several years, primarily in terms of transfer of irrigation districts. Additionally, the municipalities have been handed over more responsibilities on water supply, drainage, treatment and disposal of wastewaters. Decentralisation efforts have also included giving more responsibilities to the States in terms of drinking water, drainage and sanitation in urban areas, and drinking water and sanitation in rural areas. Other activities included are those related to the clean water programme and the programme on control of aquatic weeds (SEMARNAP/CNA, 2000). At least on paper, public participation within the water sector is being promoted through river basin councils, basin commissions and technical committees for groundwater.

In Mexico, for several years now the urgent need to build, expand and enhance cadres of qualified professionals and managers, with experience on water planning and management, have been identified as a priority issue. This is important due to the challenges faced by the managers, administrators and engineers working all over the country at the federal, state, and local levels. In fact, one of the constraints which has been recognised frequently in several past assessments for the absence of an integrated water resources management in the country is

the need to improve and make more efficient the management practices at the federal, central and local levels in the country (Lewis et al., 1992; Biswas, 1995, 1996b; IMTA/PNUD, 1995; Arreguin et al., 1996; World Bank, 1996).

Capacity Building Exercises, 1990-2000

It is axiomatic that the successful formulation and implementation of the programmes on water resources planning and management depends on the quality of human resources available. Knowledgeable and experienced staff at all levels, having a broad perspective and understanding of the importance of integrated management of natural resources, is urgently needed in all developing countries. The situation is similar in Mexico. Environmental and social issues are two critical areas where staff members still have to be educated and trained in order to first understand and appreciate their importance and relevance to the water management process, and then formulate and improve long-term water policies, programmes, and practices. Some of the groups who should be targeted for such capacity building are the managers and the engineers working in the water institutions, many of whom are still to be educated and trained on the environmental and social consequences of their decisions not only on water planning and management, but also on associated natural resources, human health and social welfare.

Based on lessons learned from several country projects in Mexico, it has been strongly recommended that capacity-building programmes should be geared towards meeting the needs of the specific levels. It has been suggested that the central offices need to focus on the development of policies, guidelines and manuals, and towards coordination of water management activities at the national level, while the regional offices should be geared towards regional planning and management, participatory initiatives, coordination of regional entities and water users, consensus building, development of institutional mechanisms for implementing and maintaining the registry for water users (REPDAs), reservoir operation, flood control, dam safety, and data collection and processing (World Bank, 1996). The central and regional offices need to interact with each other as equal partners so that each can influence the other, and, in turn, be influenced by the other.

An objective analysis of several exercises on capacity building that was carried out during the decade of the

1990s, and their impacts on water management processes and practices on Mexico follows.

Training Needs Assessment for Development of CNA Professional Staff, 1992.

In 1989, the National Water Commission of Mexico (CNA) was created by a Presidential Decree as the sole federal authority dealing with water management as an autonomous agency. It was initially attached to the Ministry of Agriculture and Water Resources. In 1994, CNA was relocated to the Ministry of Environment, Natural Resources and Fisheries (SEMARNAP), which in June 2001 became the Ministry of Environment and Natural Resources, SEMARNAT (DOF, 4 June 2001). Irrespective of these institutional changes, however, water use efficiencies and water quality conditions in the country still has to improve perceptibly. In fact, shortages in nearly two-thirds of the country is increasing not only because of water scarcity and/or continuing deterioration of water quality, but also because of lack of adequate management and professional capacities at various levels.

When CNA was established in 1989, it inherited a staff of some 35,000 people, a large percentage of whom lacked the necessary knowledge and experience on water planning and management issues and practices, and of which around 2,700 were in the middle management positions. In 1990, with the support of the Mexican Institute of Water Technology (IMTA), CNA started a programme of post-graduate training with the objective to develop their in-house expertise. IMTA was created in 1986 to carry out research activities, develop, adapt and transfer technology, provide technological services and develop human resources for the management, conservation, improvement and sustainable use of the water resources in the country. By June 1992, more than 100 professionals had graduated. Following this programme, the priority was then to train personnel specifically on technical problems of the water sector in the country (Lewis et al., 1992).

In 1992, the CNA started a diagnosis to identify the areas of expertise and training needed for professional staff within the institution so that it could perform its tasks properly and efficiently. This assessment was carried out with the support of IMTA as well as from consultants from the Thames Water International and Overseas Development Administration (ODA), U.K. A methodology and survey questionnaires were developed, and 56 managers from CNA and IMTA were interviewed. An attempt was made to develop a framework for an action plan to build expertise in CNA according to the changing

conditions resulting from the new policies on water management and planning. This assessment on capacity building was divided into two main areas -management development, and technical development- and was focused mainly on the needs of senior and middle managers at the national, regional and state levels. The main objectives of this assessment were to create self-financing and administratively autonomous water utilities; establishment of a financial system supported by the users; efficient use of water (water reuse and water quality management); develop programmes on water infrastructures and water culture; etc. (Lewis et al., 1992).

According to this assessment, the main constraints within CNA were the lack of knowledge and expertise in the overall area of general management. The following are other main issues identified. First, the definition of the role of CNA personnel was lacking. There were significant disparities between the technical skills of the personnel and the activities they were carrying out. The problem was not always lack of educated staff, since a considerable number of the personnel, working in the different offices, already had higher degrees, which were to some extent related to their areas of work. Second, different areas were not functionally efficient because of the lack of personnel at specialist levels. Third, appropriate staff members were not being released to attend the relevant training courses.

The assessment concluded that training was needed on management in all the areas of CNA. Technical training should focus on defining the role and functions of CNA officers, and relationships with other users through workshops. Broader vision of the water sector was required, including that of managing water resources at the river basin level. Areas like environmental impact analysis and management, as well as project evaluation should be strengthened. A strong need to develop expertise in water quality monitoring was also identified. Based on this assessment, CNA had planned to build adequate expertise to undertake the new activities resulting from the decentralization of water management, as well as from the new water planning procedures. The project was expected to start in April 1993, and continue for at least three years. CNA would implement the training projects, with the support of IMTA and ODA (Lewis et al., 1992).

According to this assessment (Lewis et al, 1992), the evaluation IMTA prepared out on the training needs for CNA professional staff was unfortunately not properly carried out. One of the reasons was that major divisions of CNA, like irrigation and infrastructure, as well as water administration, were excluded. In the case of the area of infrastructure, the reasons was because IMTA had already carried out an earlier assessment, which was also considered to be inadequate, as a result of which a training course based on that initial assessment, was found not

suitable. Water Administration had its own management-training programme, which was run by external experts.

The disadvantage of excluding from an overall assessment one or more essential areas of a given institution, as was in the previous case, is that agreements could not be reached among all the parties, since they were dealt with separately. Lack of communication between the various areas was also an important issue. As a general rule, the successful accomplishment of the objectives of an institution as a whole depends upon the efficient operation of all of its parts. It is thus necessary to move from fragmentation to integration, which requires an overall institution-wide analysis, and understanding of the different areas as to how the work of one affects the others and vice versa.

In the final analysis, the performance of any institution will depend upon effective compromises among its different sections. These issues and concerns were mostly neglected.

Exercise on Capacity Building for the Water Sector in Mexico, 1995.

The Programme on Capacity Building for Sustainable Water Sector Development of the United Nations Development Programme (UNDP) represents another effort for the development of appropriate policies and legal framework, institutional strengthening and community participation, and human resources development for the water sector, especially in developing countries.

In 1993, UNDP started a long-term process to develop national programmes for the planning and implementation of national water resources through capacity building. The countries initially selected were Peru, Bolivia, Costa Rica and Mexico in Latin America; Sudan, Mali and Ghana in Africa; and China (Guizhou Province) in Asia (UNDP, 1996).

In Mexico, the programme on capacity building was started in 1995 under the supervision of a foreign UNDP-expert (Biswas, 1995) and was coordinated by IMTA, with the support of a multi-disciplinary team of staff members and national consultants. The main objective of this programme was to identify the priority areas of capacity building through a national consultative process, and then to outline how, when and who could develop the needed capacities. As part of the process, IMTA carried out discussions with mostly middle level staff members of CNA, SEMARNAT, and the National Autonomous University of Mexico (UNAM). These discussions resulted in the preliminary selection of 75 areas in which capacity building would be needed. Interestingly, 72 percent of the areas identified were related to research and technology, and 28 percent with human resources development

(IMTA/PNUD, 1995; Arreguín, et al, 1996). Even though the programme was intended to be on capacity building, surprisingly, however, policy and institutional issues were not identified as priority concerns.

Further to these discussions, IMTA organized a brainstorming session with experts from different disciplines and institutions. Five study areas were identified: integrated management and planning of water resources; impact assessment and water quality; hydrometeorology; irrigation; and rural and urban water supply and sanitation. In each one of these areas, the following issues were expected to be analysed: information, health issues, social aspects, institutional arrangements, budget, strategies, tariffs and cost recovery, and technical aspects.

Terms of reference (TOR) for discussion papers for each one of the 5 areas were developed, which were subsequently prepared by national consultants chosen by IMTA. The discussion papers were distributed to representatives of several public and private institutions, research centres, universities, users associations, and NGOs, both local and national. National meetings were organised in different parts of the country, with participants to whom the discussion papers were sent earlier. A total of 239 experts took part in these five workshops. The sub-areas selected as priority by the working groups were as follows (Arreguín et al., 1996):

- integrated planning and management development: methods and models for the allocation of water; and training programmes;
- environmental impact assessment and water quality: legislation for river basin management; and administration of the legislation for impact assessment;
- hydrometeorology: flood characterisation and control; and development of manuals related to floods;
- irrigation: operation, distribution and use of water; salinity and drainage, and,
- rural and urban water supply and sanitation: water supply and sanitation for small communities (including awareness issues and education), and organisational development of public utilities, including modifications in the legal framework.

It was agreed that UNDP would provide seed money for the programme, and once the assessment was completed various Mexican institutions would jointly prepare a consolidated capacity building programme, which would then be implemented. With this, UNDP would assist the

various institutions to raise the necessary funds from national and international sources.

While the process for this study was carefully developed, unfortunately, no programme on capacity building was finally developed and implemented. One of the major constraints which lead to the non implementation of the programme was the lack of communication among the coordinators during the elaboration of the five background papers, and also among the coordinators and the consultants. A coherent approach was lacking. Not surprisingly, the programme lost momentum, and finally there was no direct follow-up action.

Assessment on the Process for Capacity Building, Sub-Directorate, Water Administration, CNA, 1995.

In March 1995, the Directorate of Water Administration of CNA, with the support of the World Bank, carried out an assessment of the capacity building requirements for the directorate, with the support of an external expert (Biswas, 1996b). The report comprehensively analysed the processes related to the administration of water, as well as the requirements needed for the programme on capacity building (institutional arrangements, and human resources development). Since the water administration processes are interrelated, and depend directly on the performances and actions of the other directorates of CNA, the lack of coordination among the various directorates was identified as a major constraint for the efficient formulation and proper implementation of appropriate policies and administrative processes. Another main issue identified was the lack of expertise of the personnel in terms of carrying out their respective duties. The recommendations included an urgent need to streamline the administrative processes, and the need to train the professional and managerial staff at the different levels, in the central, regional and state offices. Since a programme on capacity building for only the area of water administration would represent only a partial solution, an overall programme of capacity building for CNA as a whole was recommended.

This report noted that capacity building programs were not only necessary for the individual areas of CNA, but for the institution as a whole. It emphasised that the organisation should not consider only routine solutions for routine problems: any capacity building programme must consider not only today's problems but also must anticipate tomorrow's issues. Extensive and almost near-total emphasis on yesterday's problems and solutions can at best be a mid- to short-term partial solution.

Water Resources Management Project, 1996.

On the basis of extensive discussions with the staff members at various levels, the report identified a lack of understanding and/or appreciation of the goals and objectives of the several areas of the Subdirectorate. The overwhelming emphasis appeared to be to meet certain numerical targets, and not on why the targets were set in the first place, or what were their implications for national water management, should these targets be met. Hence, the emphasis was almost exclusively on the “means”, and the “end” was generally being ignored, since in most instances its relevance was not being realized, or appreciated, by the staff members. The report recommended that training and information was desirable on the goals and objectives of the water administration process and the rationale behind the water law, which the staff was trying to implement. At the time when the analysis was carried out, the Subdirectorate had produced many documents on different aspects of its work. These needed to be analysed, reviewed and integrated into one single document, which could be an important input for a capacity building process. The document could also be an essential input for a strategic planning exercise for the Subdirectorate, which among other issues could review its goals, objectives and targets for the next ten years, and whether the existing strategies to achieve them were the best. The staff needed to appreciate that the results of the aggregated activities of the Water Administration Subdirectorate should result in efficient management of surface and groundwater resources of the country in terms of both quantity and quality.

Irrespective of the benefits that such a programme on capacity building could have resulted in not only for the specific area, but also for the institution as a whole, two changes in the Deputy Director General of this area in one year meant that no realistic programme on capacity building was ever developed, let alone implemented. In fact, following the departure of the Deputy Director General under whom this analysis was carried out, the report was ignored. Unfortunately, this case represented one more example of lack of continuity of programmes, which shows basically that the commitments are for the most part at the personal level, and not at the institutional level.

In 1996, the Sub-directorate of Planning, CNA, started a process to develop an overall assessment of the capacity building needs for the institution with the support of IMTA. Unfortunately, availability of information from CNA, as well as other associated institutions, has been a continuous problem. In this particular case, the report was considered to be an internal document, which means no one outside the institution could have access to it. Accordingly, the quality and relevance of this report cannot be analysed. However, irrespective of its quality, it did not appear to have any impact on the institution.

The Water Resources Management Project (PROMMA) was an initiative of the water authority in Mexico to improve the water management in the country. This initiative was supported by the World Bank and covered areas of irrigation and drainage, on farm and minor irrigation networks improvement, and water supply and sanitation projects. The overall objective was to achieve an “integrated, economically efficient and environmentally sustainable water use through better management” (World Bank, 1996). The idea was to provide the necessary support to the water sector so that the targets of the Law of National Waters (Anon, 1997) could be achieved.

The project was expected to assist the Government of Mexico to improve its water resources policies and management capabilities in different areas, and was being executed by CNA. It was expected to be completed by 2001. The total cost of PROMMA was estimated at US\$342 million, 54.5% of which would be provided by the World Bank as a loan, and the rest would be provided by the country. Some of the main goals of this project were: (1) training and technical assistance; (2) modernisation of meteorological, hydrological and climatological networks; (3) streamlining and strengthening of water use administration; (4) planning and information systems; and (5) modernisation of the operation and security of dams and reservoirs management.

The PROMMA, at least conceptually, was intended to have a major positive effect on the environment. The project was planned to contribute to significant environmental benefits, and provide the government with adequate tools on the areas of: (1) institutional development, technological support and training; (2) water quantity and quality monitoring improvement and assessment; (3) reservoir operation, dam safety, and aquifer management improvement; (4) water rights administration; and (5) water resources planning and river basin council support. It would not include direct investment activities on new hydraulic infrastructure facilities, implementation of water quality improvements plants, implementation of the groundwater stabilisation plans, implementation of regional water resources plans, and remedial action on existing dams with safety problems. In order to implement PROMMA, full time professional staff positions would be established in CAN, mainly within the subdirectorates for Planning, Technical Issues and Water Administration. (World Bank, 1996).

The PROMMA agreement was signed in 1996. It stressed the fact that water resources management needed to be strengthened at the central and regional levels. It pointed out that even though Mexico had considerable

expertise in the construction and operation of water projects, the water sector still needed a strong, cohesive interdisciplinary group having a broader vision of planning and management. The project document confirmed the general findings of the earlier study on the "Training Needs Assessment for Development of CNA Professional Staff" which indicated that CNA lacked expertise, equipment and technology in the field of monitoring programmes, essential for managing and controlling water quantity and quality, regional water resources planning, reservoir operation, aquifer management, and dam safety.

A considerable part of the project was expected to be implemented by the regional offices. Because the regional offices would require strong support from the central offices in terms of capacity building and training, risks identified, which could constrain the successful implementation of the PROMMA were "decentralisation, technical skills and capacity building." To mitigate this risk, PROMMA recommended a major emphasis on "institutional development, technological support and training." A total of US\$37.6 million were allocated to finance goods, services, training, and consultants to support water resources planning and management activities at all levels in CNA, and to improve the technological resources and skills of the professional staff. The monitoring of the implementation of the project was expected to focus in the first year on the progress in training programmes and adequacy of project coordination (World Bank, 1996). Achievement of the goals of the PROMMA has been delayed several times. At present (CNA et al., 2000), they have been set for 2003, which on the basis of present evidence, will probably be delayed again.

Other additional risks identified by the World Bank for the successful implementation of the PROMMA were the project management and coordination within CNA, and the inadequate budgetary allocations. It is important to note that there were fundamental problems for the successful implementation of PROMMA during its early years mainly due to the lack of funds released by the Ministry of Treasury and Public Credit (Secretaria de Hacienda) to hire permanent staff for PROMMA. At the same time, as part of a restructuring programme in the public sector, hundreds of technical staff were dismissed from CNA. This means that CNA was not able to hire suitable qualified personnel for the execution of the PROMMA, and at the same time, it was unable to keep many of its core technical staff. The lack of personnel, both in terms of number and expertise, continues to be one of the main constrain to implement PROMMA.

It is interesting to note that almost one decade after the training needs assessment studies were initiated, the most recent evaluation of PROMMA still identifies the need to build technical personnel with skills on decision-making and integrated management of water resources as a priority. According to this report, the seventh mission of the World Bank fielded in September 2000, recommended an urgent update of a previous assessment on the profile of the personnel that would be needed if PROMMA is to be implemented, even after the dates of its completion have been extended. This urgency is because of lack of properly qualified and experienced management and technical personnel, which consistently has seriously delayed the completion of PROMMA. If the areas of CNA that are directly involved with the implementation of PROMMA continue to fail to develop their human resources to a minimum acceptable level within a reasonable period of time, the objectives and activities of PROMMA would have to be reduced so that they can be implemented. Based on past performance records, this is likely to be a real possibility (CNA et al., 2000).

Further concerns to the successful implementation of PROMMA include the lack of concrete actions in the design of programmes with an integrated approach, which depend on the successful coordination of the different areas of CNA; unnecessary bureaucratic procedures; and the need to objectively review if modifications of the Law of National Waters and its regulation are necessary.

One of the main objectives of PROMMA is decentralisation in the water sector through management at the river basin level. This issue is beyond the scope of the present paper. However, objective analyses by Dourojeanni (2001), Tortajada (2001) and Guerrero-Reynoso (2000) provide an overview of the current situation in terms of the continuing ineffective and centralised management at the river basin level in Mexico. As further noted by Kemper & Alvarado (2001), river basin councils and COTAS have no legal authority, and are still in strong need of technical, financial and institutional support. It is not the number of river basin organisations that have been established that is relevant or important, but rather if they are effective in improving the efficiency of the water management practices within the basins concerned. In spite of the official rhetorics, such improvements have been hard to find. Thus, an essential question that must be answered is whether the present institutional, financial and technical approach for water management at the basin level is the most appropriate one. If the answer is no, which appears to be the case at present,

then it should be questioned, and the focus should move to how it should be modified

Additional Efforts on Training and Education

Most universities in Mexico have engineering schools. However, there are still no good curricula, either at the undergraduate or postgraduate levels that consider adequately topics like economics, sociology, environment, biology, laws and institutions. The focus continues to be on engineering: other aspects of water management are mostly ignored. A multi-disciplinary, multi-sectoral approach to water management is conspicuous in the Mexican universities by its absence (CNA et al., 2000). Accordingly, the importance of the capacity building programmes, which are an important component of PROMMA, should not be underestimated

In terms of training centers, in 1998, CNA and the National Association of Irrigation Users (ANUR) established the National Centre for Transfer of Technology on Irrigation and Drainage (CENATRYD) in Sinaloa with the objective of training technicians and users. The Centre is being operated by ANUR and is used by 400 groups of irrigation farmers. Its cost was approximately 7.5 million pesos (approximately US\$810,000, at the then exchange rate). It was sponsored by the Spanish Agency for International Cooperation (AECI) (32 percent), and the balance was covered by CNA, IMTA and the users association. In 1998, 239 technicians were trained in 18 courses on design of irrigation systems, control of aquatic weeds, operation of irrigation districts, dams regulation, use of water for irrigation, drainage, management of saline soils, etc. (www.invides.com.mx).

In August 2000, the Mexican Centre for Training in Water Supply and Sanitation (CEMCAS) was established in Texcoco, within the Metropolitan Area of Mexico City. The nine founding members of this center are CNA, the French Embassy in Mexico, the International Office for Water (IOWater), the Federal Secretariat of State for Labour and Social Affairs, IMTA, the National Chamber of Consulting Firms, the National Association of Water and Sanitation Companies, the Mexican Chamber of Construction Industry, and the National Chamber of Processing Industry (www.cna.gob.mx).

This training center is a non-profit organisation. Its main objective is to provide practical training to technical and operational staff members of the water utilities, not only in Mexico, but also for the Central American countries.

Regarding promotion of research activities, CONACYT and CNA have established a programme on research and development for water resources. Initially, financial support will be given to proposals which target specific

problems in specific hydrologic regions of the country (Pacífico Norte (III), Río Bravo (VI), Lerma-Santiago (VIII), Frontera Sur (XI) y Valle de México (XIII). (www.main.conacyt.mx). However, no substantial analysis of the impacts of these programmes, or review of the quality and appropriateness of the individual programmes are available at present.

Planning for the Present and the Future

At present, CNA is proposing time horizons for the years 2006 and 2025 in terms of water management, which includes consideration of surface and groundwater management; water supply, drainage, sanitation, irrigation, basin management, water administration processes, flood control, etc. All these aspects need to be looked at within an integrated water resources management (SEMARNAP/CNA, 2000). There is no doubt that realistic and implementable short-, medium-, and long-term planning processes are fundamental for efficient water management. However, it is interesting to note that objective observers have concluded that one of the most resistant sectors in Mexico in terms of institutional reform so far, has been the water sector, partly due to the complex relationships between the three levels of government, lack of transparency, control on information flow, and genuine stakeholder participation (Giugale, 2001; Pargal, 2001). It is not only essential to have adequate capacity in the institutions to carry out proper long-term planning, but also the existence of an enabling environment within which such a planning process can be carried out with the real participation of all the appropriate stakeholders. It is also necessary to have an adequate numbers of properly qualified and experienced staff to implement any plan, after it is formulated.

As noted earlier, IMTA was created to carry out research activities, develop, adapt and transfer technology, provide technological services, and develop human resources for the management, conservation, improvement and sustainable use of the water resources. The programme for the year 2000 of this institution indicates several activities in terms of professional and institutional development (www.imta.gob.mx). It points out that during this period, 56 meetings were organised with 1,171 participants. Sixteen of these meetings were training courses with 302 participants from National Council of Science and Technology (CONACYT), National Centre for Technology Research and Development (CENIDET), SEMARNAT, and IMTA staff. Thirty-three meetings were on technical issues between IMTA and CNA, with 689 participants, and seven events were technical visits, with 180 participants from several institutions.

While the numbers are impressive, no analysis is available on the quality, relevance and appropriateness of these activities, and their impacts, if any, on the water management practices of the country. The question remains then, where are the bottlenecks for implementing a realistic programme on capacity building in the water sector in the country. It is true that there is an institution to conduct research on water-related issues, which is also responsible for developing human resources in the field of water at the national level. It is equally true that there are many qualified personnel in the various institutions related to water. However, the fact still remains that there is an urgent need to develop human resources in areas that are not purely engineering, but which are equally necessary for the efficient performance of the water sector, like management, administration, economics, social, environmental and legal issues.

There are several reasons as to why so many government programmes and services in the country have not had the desired impacts. These reasons include centralised decision-making, which has for the most part failed to identify and then meet the needs and the preferences of the people. In terms of institutions and human resources development in the water sector during the past five years, the constraints have been mainly in terms of lack of continuity in the institutional programmes (World Bank, 1996, 2000, 2001), lack of ability and flexibility of the institutions concerned to adapt to new trends and changing requirements for the functioning of a modern water sector. It is likely that the programmes and actions needed for a more efficient and more dynamic water sector still have not been adequately recognised and hence targeted.

For the water sector, CNA has pointed out the need for decentralisation for several years. However, the institution itself has now recognised that there are still numerous challenges that would have to be overcome before decentralisation can produce worthwhile results. Despite the considerable progress being made in defining an approach to integrated management, it is still unlikely that the future challenges can be met through the existing institutional arrangements and approaches. For example, a more proactive approach is needed towards empowering river basin and aquifer committees to manage and monitor the use of water. It is equally necessary to strengthen the management capacity and expertise within the water institutions at the federal, state, regional, local and users' levels, etc. Civil service training is just one of the institutional underpinnings that are yet to be systematically

built into the country's decentralization process for most sectors, including water (World Bank, 2000).

Decentralisation cannot be expected to work, if functions are transferred without the resources to implement them, or when spending responsibilities are not accompanied by decision-making power, adequate infrastructural setting, a revision of the sources and the mechanisms for financing and fiscal responsibility at the local level. The Mexican municipalities are mostly struggling to fulfil their functions due to lack of funds, and most water utilities in the country are decentralised municipal or state entities, and not autonomous commercial-oriented operators. The lack of transparency and sound policies at the three levels of government of the provision of this service has led to financial instability, dependency on state and federal financial support, under-investment and poor targeting of subsidies (Pargal, 2001).

If the decentralisation of the water sector is to succeed, capacity building needs to be assessed and addressed at a national level, which is much broader than the needs of CNA itself. CNA, as the most important water institution in Mexico, needs to play an active role in building the national capacity in terms of education and training of water professionals, in close partnership with other appropriate institutions. In addition, capacity needs to be built up, not based upon what was necessary in the past, but based upon the current requirements and anticipation of the future problems, which are likely to be very different from the past in terms of their nature, magnitudes, and complexities. World is changing very fast, and with it the Mexican water sector is changing as well. Business as usual is no longer a feasible option, as the report of the World Commission on Water clearly pointed out (World Commission on Water, 2000).

Conclusions

An in-depth, objective analysis indicates that a system-wide, long-term capacity building programme still does not exist in Mexico, even though its necessity was identified several times during the past decade. For example, the urgency and importance of capacity building were clearly identified in 1992. These needs were repeated in the assessments of 1995, 1996, and 2000. Unfortunately, these concerns have not resulted in any realistic capacity building programmes on a continuous basis for the institutions concerned. Ad-hoc programmes have sprung up, many of whose qualities and impacts can be seriously questioned. Aggregation of such ad-hoc, division-wise, short-term is highly unlikely to contribute to sustained

actions for building the necessary institutional capacities within a reasonable timeframe in a cost effective manner. Efficient water management in the country is not possible if capacity building requirements continue to be neglected, as has been the case in the past.

Future needs include multi-disciplinary and multi-sectoral approaches to water planning and management, with concurrent emphasis on technical, economic, social, institutional, environmental and legal issues. Without such holistic efforts, attempts to improve water management practices in the country, including decentralisation of water management can only produce limited results. In order that the capacity building programmes are effective, the training requirements need also to be identified and satisfied at the local levels, by the local staff, and not primarily dictated from the center. This is because, in many cases, the center is not fully aware of the local needs, requirements and priorities.

Finally, until and unless long-term capacity building programmes are considered as a priority within the management and planning of water resources, the overall progress is likely to continue to be marginal.

About the author



Dr. Cecilia Tortajada is Vice President of the Third World Centre for Water Management in Mexico. She has been advisor to several international organizations and governments of developing countries on regional development issues, especially in terms

of water resources development and environment. She has contributed to the development of national environmental actions plans, environmental protection guidelines for the water sector for countries ranging from Cameroon to Zaire, environmental and social evaluation of water projects, including large dams for Mexico and Turkey, capacity building programs, etc., in Latin America, Asia, and Africa. Dr. Tortajada's work has been published extensively in international journals. She serves as a Director of IWRA and has worked extensively in different parts of the world to increase the impacts of IWRA through numerous activities. Dr. Tortajada can be reached at Third World Centre for Water Management, Avenida Manantial Oriente No. 27, Los Clubes, Atizapan, Estado de Mexico 52958, Mexico. E-mail: thirdworldcentre@att.net.mx.

Discussions open until June 1, 2002

References

- Alaerts, G.J., T.L. Blair & E.I.A. Hartvelt eds. 1991, *A Strategy for The Water Sector, Capacity Building*. New York, New York, USA: International Institute for Hydraulic and Environmental Engineering and United Nations Development Program, Delft.
- Anon, 1997, *Ley de Aguas Nacionales, su Reglamento y Ley Federal del Mar*, Delma, 4th edition, México.
- Arreguín, F., L. Márquez and A. Gómez, 1996, Capacity Building in Mexico, *Water Resources Development*, 12, No. 4: 483-490.
- Biswas, A.K., 1978, *United Nations Conference: Summary and Main Documents*, United Kingdom: Oxford Pergamon Press.
- Biswas, A.K., 1995, *Mission Report on Capacity Building Programme for Sustainable Water Sector Development in Mexico*, New York, New York, USA: Science, Technology, and Private Sector Division. UNDP.
- Biswas, A.K., 1996a, "Capacity Building for Water Management: Some Personal Thoughts", *Water Resources Development*, 12, No. 4: 399-406.
- Biswas, A.K., 1996b, *Capacity Building Assessment for the Sub-directorate of Water Administration*, Internal Report.
- CNA, World Bank, and Organización Meteorológica Mundial, 2000. *Evaluación Técnica del PROMMA, Informe OMM/PROMMA No. 50*, México, D.F.
- Dourojeanni, A., 2001, *Experiences in the Formation of Basin Bodies in Iberoamerica*, XI Jornadas de Derecho del Agua, Zaragoza, Spain.
- Giugale, M. 2001. "A Comprehensive Development Agenda for the New Era, Synthesis, in Mexico, A Comprehensive Development Agenda for the New Era." M. Giugale, O. Lafourcade, and V. H. Nguyen, eds. Washington, D.C., USA: World Bank.
- Guerrero-Reynoso, V. 2000, "Proposal for the Decentralization of Water Management in Mexico by means of Basin Councils." *International Workshop on Water Policies and Institutions*. Salvador, Brazil, November.
- IMTA/PNUD, 1995, *Reunión de Trabajo sobre Investigación, Desarrollo Tecnológico y Formación de Recursos Humanos*, Mexico.
- Kemper, K. and O. E. Alvarado. 2001. "Water, In Mexico, A Comprehensive Development Agenda for the New Era." M. Giugale, O. Lafourcade, and V. H. Nguyen, eds. Washington, DC, USA: World Bank: 619-643.
- Lewis, G., M. Torres and G. Larios, 1992, *Training Needs Assessment for Development of CNA Professional Staff*. Mexico: CNA/IMTA, Internal Report, Mexico.
- Pargal, S. 2001, "Regulatory Environment for Private Sector Participation in Infrastructure, In Mexico, A Comprehensive Development Agenda for the New

Capacity Building for the Water Sector in Mexico
An Analysis of Recent Efforts

- Era.” M. Giugale, O. Lafourcade, and V. H. Nguyen, eds. Washington, D.C, USA: World Bank.
- SEMARNAP/CNA. 2000. *El Agua en México: Retos y Avances*, México, D.F.
- Tortajada, C. 2001. “Institutions for Integrated River Basin Management in Latin America.” *Water Resources Development*, 17 No. 3: 289-301.
- UNDP. 1996. *Capacity Building Programme for Sustainable Water Sector Development*. Status Report, New York, USA.
- World Bank. 1996. *Staff Appraisal Report, Water Resources Management Project*, Report No. 15435-ME, Sector Leadership Group, Mexico Department, Latin American and the Caribbean Region, Washington, DC, USA.
- World Commission on Water. 2000, *Water Resources Development* 16, No. 3: 289-320.