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Victoria Novoa Pineda, Myriam; Iván Ordónez Ordónez, Jaime

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THE WATER CRISIS IN COLOMBIA

BY MYRIAM VICTORIA NOVOA PINEDA & JAIME IVÁN ORDÓÑEZ ORDÓÑEZ

Resumen

Muchos países de Latinoamérica sufren actualmente una crisis del agua, por falta de una política integrada de manejo del recurso, dentro de los planes de desarrollo sostenible. Esta crisis se agrava con el cambio climático y las modificaciones antrópicas, anunciando una vulnerabilidad creciente en la disponibilidad de agua. La crisis es patente en muchos problemas ambientales como la pérdida de calidad de las fuentes hídricas, la pérdida de vida útil de los embalses debido a la sedimentación, la degradación de los humedales debido a la desecación, los rellenos, y la contaminación, y las deficiencias en abastecimiento de agua y saneamiento básico, irrigación, y navegación.

Water is the most important resource of humanity: life is not possible without water. When water is scarce, drought torments plants, animals and people equally; in fact, it affects all living organisms. When water is too abundant, disasters due to flooding, landslides and debris flows threaten all living beings in these areas. Even so, water does not seem to be one of the leading elements in national planning in Latin America. Development plans call for the construction of infrastructure, transportation networks, telecommunications, energy generation, mining and oil production, and call for industrialization at the level of more developed countries. These are viewed as the vital elements of development, but they do not place much emphasis on water infrastructure.

Climate change is already recognized as a factor for planning, but relatively little attention is paid to the fact that anthropogenic land changes have a more drastic effect than climate change on the availability of water. The later usually occurs at a faster pace, while climate change occurs over longer time scales. Within a few months of construction, a road, railway, dam or dyke can completely modify the drainage patterns in a given area, causing dramatic changes in the regional availability of water before climate change has any effect on it. A decrease in the availability of potable water and the implementation of basic sanitation to avoid contamination of water sources and the proliferation of water borne diseases, can rapidly affect people's quality of life.

The water crisis and its management and planning are of paramount importance today in the field of water resources in Latin America. This is especially true in Colombia where, despite the relative abundance of water, many problems hamper its conservation and sustainable development. Water resources development must be reoriented on the basis of past lessons, accounting for present challenges and various proposals for their solution, considering the demand and supply of water, and the pressures of climate and anthropogenic land use changes.

Potable water and basic sanitation

Even though significant progress has been made in the supply and treatment of water for the larger urban centers, many cities still lack truly potable water due to the combination of the high cost of treatment plants and filtration systems, and the lack of protection of most watersheds from human encroachment and pollution. The rural sector is almost completely abandoned, due to the lack of proper strategic planning for water supply and basic sanitation infrastructure in rural areas.

Large infrastructure projects, which appeal to politicians, are often built at great economic cost, utilizing resources needed to formulate effective plans for water development, which could quickly improve people's quality of life. There is a great need for more coordinated efforts in optimizing economic spending on attainable short term goals, to achieve adequate levels of water quality and quantity for all communities and a sensible improvement in the quality of wastewater effluents.

Land reclamation for agriculture

Management of water for agriculture and husbandry in Colombia has not been successful in the last 50 years, despite large

Figure 1. Intake of the Saldaña River; Tolima Triangle irrigation project, Colombia


Figure 2. Sogamoso river Hydropower project, Magdalena-Cauca basin, Colombia

manpower costs and monetary expenditure. There are few efficiently operated irrigation districts, few storage reservoirs, and a worrisome backwardness in the agricultural sector. The lack of proper research and development efforts in the design of suitable intake structures and distribution systems, control of water losses, channel and intake sedimentation and increasing costs of operation and maintenance reduce the real extent of irrigated lands, and minimize production.

In Colombia, planners spend more time experimenting with complicated administrative schemes for the equitable fund allocation among regions, than in making proper evaluations of water and soil resources, in order to detect real needs and potentialities for agricultural development, in accordance to the availability of markets, the profitability of products, and the required finances; too much emphasis is placed on economic and legal constraints, and not much on technical support for planning.

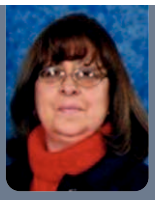
Risk management for flooding and natural disasters

The serious flooding emergency of the 2010-2011 rainy season, clearly revealed the many deficiencies in risk management for natural phenomena in Colombia, which are also most likely extensive in other countries in Latin America. These deficiencies frequently are due to the lack of knowledge about the functioning of natural systems, (particularly those of tropical and subtropical regions), and the anthropogenic effects caused by infrastructure projects. These projects are usually planned with limited areal scope and no holistic conception on the use of natural resources, introducing vulnerabilities that much exceed those that are purely natural.

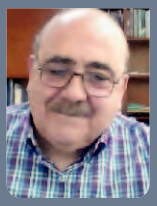
Sediment management in reservoirs

The absence of adequate regulation for the management of sediments in large reservoirs, leads to loss of storage volume and the early end of the useful life of projects for water supply and hydropower generation. These problems must be faced, as it is done in more developed countries, such as the European Union, within a legal framework to allow the evacuation of sediment from the reservoirs, with periodic use of bottom gates, or other available means proven physically and environmentally safe.

Privatization of energy generation systems, as has been going on for example in Colombia, since 1996, debilitates national engineering practice, which created and operated these projects efficiently for years. International owners are mostly interested in short term profits, and not in the long term - costly maintenance of reservoirs, dams and appurtenances - which can lead to the early loss of important infrastructure in which countries spent money, manpower and human lives.



Myriam Victoria Novoa Pineda **is a Civil Engineering Consultant, specialising in irrigation and drainage, from CEDEX in Spain. She is the current President of the Commission on Water Resources Engineering at the Colombian Society of Engineers, where she was a member of the Directive Council for 18 years, and has served on the editorial board of Annals of Engineering, its technical magazine. She worked for 20 years at the Colombian Institute for Hydrometeorology and Land Reclamation, HIMAT, and was technical secretary at the National Commission for Irrigation and Drainage. She holds the Julio Garavito Order of the Colombian Government for academic and professional merit.**



Jaime Iván Ordóñez **is a Civil Engineering Consultant in Water Resources Engineering with both M.Sc. and Doctor of Engineering degrees from the University of California, (Berkeley). He is a member of the Colombian Society of Engineers and of its Commission on Water Resources Engineering, of which he has previously been president. He is a retired professor of the National University of Colombia and the author of several books on channel hydraulics. He is a founding partner at Estudios y Asesorias Engineers, a firm with 40 years of experience in water Resources and environmental engineering. He holds the Julio Garavito Order of the Colombian Government for academic and professional merit.**

The protection of water bodies and wetlands

Wetland degradation is usually brought about by the construction of dykes and landfills that obstruct water flow, affecting the development of aquatic ecosystems. Typical of this degradation is the problem facing the “Ciénaga Grande of Santa Marta”, in Colombia, the largest coastal lagoon in Latin America, with over 500 square kilometers of water surface area and peripheral mangrove wetlands. The lagoon and its surrounding areas are under extreme anthropogenic change stress due to large illegal landfills, and the construction and

enlargement of a major roadway along the sand spit that created it.

Loss and degradation of wetlands, by filling, pollution and interference with its water sources, interrupt and diminish their capacity to perform their physical and biological functions: the storage of water and mitigation of floods, the retention of sediments and nutrients, the growth of medicinal plants and organisms, aquifer recharge and subsoil salinity control, absorption of contaminants, and the maintenance of trophic chains essential to sustain the life of all living organisms.

Inland navigation and its effect on river contamination

Contamination of river waters is one of the major causes of the increased costs in withdrawal, conveyance, distribution, and particularly in water treatment, for multipurpose uses. In Latin America today, most river pollution is caused by untreated discharge of wastewater from agricultural lands and urban concentrations. Industrial pollution is still incipient, although the risk persists from the lack of control of industrial effluents. An additional risk is imposed by the much heralded need for fluvial transportation of industrial goods, as it is promoted now for the Magdalena River of Colombia, 29th in the list of largest alluvial systems of the world. Fluvial navigation of people and normal loads could benefit riverine communities, but only industrial fluvial transportation has the unequivocal support of economic planners, who consider it as the only economically profitable part of inland navigation. The reason claimed is the assumed low cost in transportation of bulk materials.

It is worthwhile to remember that the most contaminated rivers in the world are those in which large industrial navigation systems exist. Most fluvial bulk cargo shipments consist of dangerous materials such as crude oil and its derivatives, unprocessed minerals from mining operations, fertilizers, pesticides, and other chemical materials that contain dangerous substances that could run havoc when directly discharged in water sources by accidental spills. The safety of people and not the costs of transportation should be the deciding factors; when the cost of cleaning of spills is considered, the cost of industrial navigation does not look so profitable.

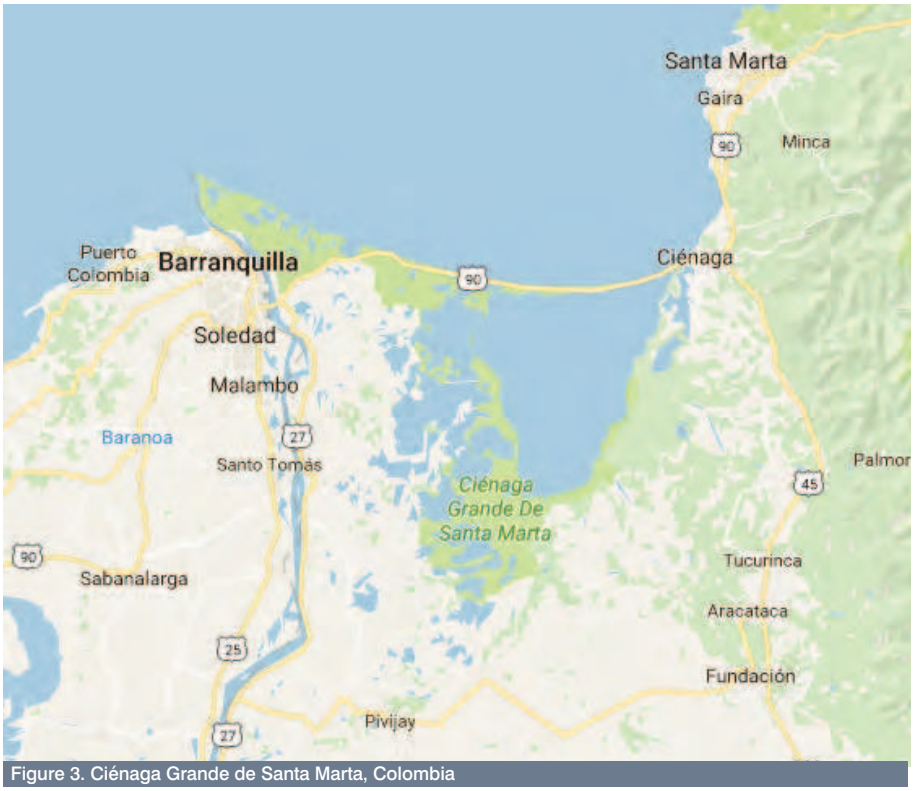


Figure 3. Ciénaga Grande de Santa Marta, Colombia

Management of water resources

The water crisis is brought about by society's disregard for the need to develop instruments for an integrated policy on water management within the plans for sustainable economic development. This policy should also take into account the present challenges of climate change and anthropogenic land use changes, making the countries more vulnerable to the spatial and temporal variability of water supply.

The lack of adequate criteria for the management of water resources, generates environmental problems, and affects the quality of life. It also leads to the present deficiencies in water supply infrastructure, distribution networks, and potable and wastewater treatment plants in both urban and rural areas, infrastructure for irrigation projects, and the security of fluvial navigation.

Some of the most common environmental problems are the continuous degradation of water quality in rivers and other water bodies, the loss of reservoir life to sedimentation, and the degradation of wetlands by desiccation, landfilling and pollution. Education of water users and increase in public awareness on water management issues is also needed.

Socioeconomic, cultural and environmental sustainability must prevail, over the construction of large infrastructure works in development plans. There is not much worth in having electricity to illuminate the poverty of marginalized urban and rural communities; it does little service to the people on the roadsides, and along railways and rivers, to see luxury vehicles and huge loads of food, fuels, and riches of all sorts, crossing their paths at high speeds towards the well-served tables of the most fortunate, in the large and far away urban centers. Development cannot be achieved by reproducing the infrastructure of the developed nations; it requires well-nourished communities of educated people, confident, and hopeful of a dignified future, with work, robust economic growth, and an environmentally sustainable future. If a long term policy approach to water management with a holistic view of development is not implemented soon, the consequences could be disastrous and changes could become irreversible. ■

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