

**Colombia Case Study for the Symposium on
Sustainable Water Supply and Sanitation: Strengthening
Capacity for Local Governance**

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Capacity Development in the Water Supply Sector
Case Study in Colombia

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ACRONYMS

CD:	Capacity Development
CMP:	Catchment Management Plans
CSEP:	Community Small Enterprises Program
CVC:	Regional Autonomous Corporation of Valle del Cauca
DANE:	National Department for Statistics Administration
DDWBS:	Directorate of Drinking Water and Basic Sanitation
DPSS:	Domiciliary Public Services Superintendence
ECP:	Entrepreneurial Culture Program
EISC:	Environmental Information System for Colombia
EMP:	Entrepreneurial Modernization Program
FAO:	Food and Agriculture Organisation
FINDETER:	Territorial Development Financial Entity
GAIO:	General Accounting Inspector Office
GDWR:	General Directorate of Water Resources
GPO:	General Prosecutor Office
GPS:	General Participation System
ICONTEC:	Colombian Institute for Technical Standards
IHMES:	Institute of Hydrology, Meteorology and Environmental Studies
INSFOPAL:	Institute for Municipal Promotion
LCCP:	Labor Competencies Certification Program
LSU:	Level of Satisfaction of Users
MDE:	Ministry of Economic Development
MEHTD:	Ministry of Environment, Housing and Territorial Development
NHI:	National Health Institute
NPD:	National Planning Department
NWC:	National Water Council
PAO:	People's Advocacy Office
RAC:	Regional Autonomous Corporation
RBSP:	Rural Basic Sanitation Program
RCW:	Regulatory Commission for Water
RWSP:	Rural Water Supply Program
SENA:	National Learning Centre
WCP:	Water Culture Program
WSP:	Water and Sanitation Program

1. INTRODUCTION

The present document was created as an initiative of the International Water and Sanitation Centre (IRC) from The Netherlands, during the Sustainable Water and Sanitation Symposium: Strengthening Capacities for Local Governability, when they decided to carry out a case study in several countries of the world, with the cooperation and support of different partner organizations. These case studies aim to analyze capacity development (CD) at the intermediate level in the water sector in different countries. In Colombia, the study was developed by the Instituto de Investigación y Desarrollo en Agua Potable, Saneamiento Ambiental y Conservación del Recurso Hídrico – CINARA (Institute for the Research and Development of Drinking Water, Environmental Sanitation and Water Resources Conservation) of Universidad del Valle.

Methodology implemented in the development of this study included:

- Revision of relevant secondary information
- Interviews with people working in water sector organizations¹
- Report and document feedback with Cinara staff and external consultant

It is well understood in this study that *Capacity Development (CD)* is the ability of individuals, organizations and the society to perform certain functions, solve problems and set and achieve goals. Therefore, CD includes the creation, utilization and retention of such capacity, in order to reduce poverty, enhance self-reliance and improve people's lives. .

Likewise, *Intermediate Level* refers to stakeholders making the interface between the national level and those organizations or corporations providing water services to end users. This includes *public sector* institutions (district, local and regional governments and public training institutions and universities), *private sector* institutions (private firms involved in the design, construction and operation of water systems, consultants, spare parts shopkeepers, rural sections of water utilities, private universities, professional organizations) and *civil society organizations* (regional NGOs, users associations, ecclesiastic councils, etc.).

This document provides general information on the Colombian water sector in terms of coverage, policies, financing, institutional structures and main stakeholders. Additionally, it analyzes the strengthening of capacities in Colombia and establishes a series of conclusions and recommendations on this subject.

¹ The authors of the study case appreciate and thank the cooperation of the following persons that kindly responded the questionnaires during interviews held with each of them: Francisco Burbano (UNICEF), Isabel Cristina Castaño (Household Secretariat of Caldas), Fabiola Berón (South-West Regional Direction of the Domiciliary Public Services Superintendence) and Arlex Saavedra (Organization of Water and Sanitation Services Provision Companies - AQUACOL).

2. COLOMBIAN CONTEXT

The Republic of Colombia is located at the north-western corner of South America, covering a surface of 1,141,748 sq. kms., with approximately 41.5 MM inhabitants, according to first results disclosed by the 2005 General Census (DANE, 2006). This figure makes Colombia the third most populated country of Latin America, after Brazil and Mexico. Approximately 40% of the Colombian population is concentrated in the main five (5) metropolitan areas: Bogotá, Medellín, Cali, Barranquilla and Bucaramanga. In total, 75% of it lives in urban settlements and 25% in rural areas.

Violence in Colombia due to the present armed conflict has generated an internal displacement problem in the country, assessed by the United Nations as one of the greatest in the world. Over 2 MM people have been displaced mainly from rural areas to the large urban centers. This accelerates the demand of public water and sanitation services in peri-urban areas of large and intermediate cities, where the displaced population often settles. Table 1 shows other indicators of Colombia.

Table 1. Colombian Indicators

Indicators	Situation
Total surface	2,070,408 km ² in total; 1,141.748 km ² of continental area and an area and 928,660 km ² of maritime area.
Population	41.5 MM inhabitants. 75% living in urban areas and 25% in rural areas. 48.6% male and 51.4% female.
Political-administrative division	32 departaments, 4 districts and 1,098 municipalities
Literacy rate	89.9%
Birth rate	20.48 births/1,000 inhabitants
Mortality rate	5.58 deaths/1,000 inhabitants
Access to public services	Electricity (96%), water supply (86.5%), sewerage (76.9%), telephone – land lines (57.3%), natu gas (44.6%)
Number of individuals per household	Approximately 69.3% of households have 4 or less individuals
Activities associated with rural households	Agriculture (69%), cattle (90.4%), pisciculture (3%).

Source: Bulletin of the 2005 General Census Colombia. DANE, 2006

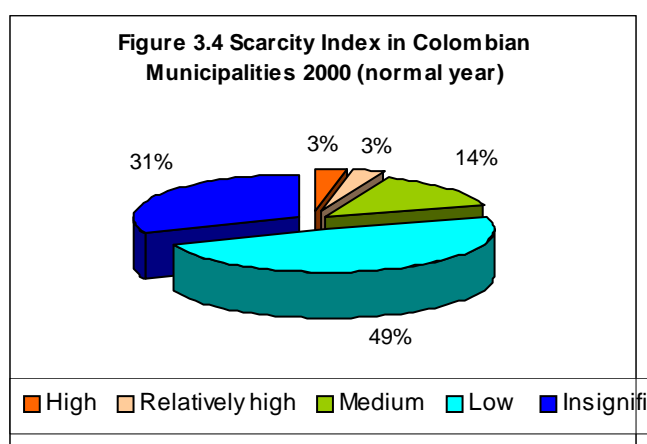
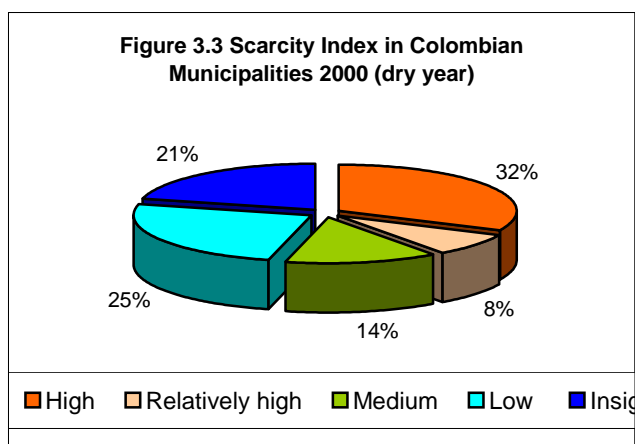
3. WATER SECTOR IN COLOMBIA

3.1 Situation of the Water Sector

3.1.1. Water availability

Historically, Colombia has been considered a rich country in terms of its surface and groundwater water resources availability. According to FAO (2003), Colombia occupies the seventh position in the world in terms of water resources availability, following Brazil, Indonesia, Russia, India, Canada and China, due to bio-physic and climatic conditions of some of Colombia's regions that are still well preserved.

The National Water Study (2000) carried out by IHMES, the Institute of Hydrology, Meteorology and Environmental Studies, seems to prove that water shortage problems do not exist in Colombia since under a normal year conditions, only three per cent (3%) of the municipalities face this problem. However, when weather conditions change to a dry year, the percentage of municipalities affected by water shortage increases dramatically, reaching 32% of them (See Graphs No. 1 and 2). Apart from this, there is a critical problem with water resources in Colombia and it is its uneven spatial distribution. For example, the Andean Region, which represents 24% of the national territory, produces 80% of the Gross Internal Product (GIP) and holds 70% of the country's population, only has 10% of water resources (Rojas, 2003). According to IDEAM, if measures for the preservation and adequate management of water resources are not immediately taken, by 2015 and 2025, 66% and 69%, respectively, of the Colombian municipalities could be at high risk of having water scarcity during dry years.



Figures 1 and 2. Scarcity index in Colombian municipalities during a dry and a normal year.
Source: Rojas (2003), based on IDEAM (2000)

Therefore, one of the actions taken by the Colombian Government in order to face this problem is the implementation of the Catchments Management Plans (CMP, Decree 1729/2002), aimed to guaranteeing the preservation and adequate management of water resources. However, very few plans have been formulated until now because there is not a specific methodology for doing so and the entities (Regional Autonomous Corporations RACs), responsible for the CMPs often lack technical and financial capacities. .

3.1.2. Water and Sewerage Coverage

Results of the 2005 General Census indicate that 86.5% of the Colombian population has access to water services and 76.9% to sewerage services. This means there are still approximately 5.7 million inhabitants lacking access to water supply services whilst 8.6 million people have not access to sanitation solutions. This is a reality, in spite of the fact that the country has shown a growing trend in the coverage figures of water and sewerage services during the last years (Figure No. 2), that has not allowed minimizing the gap between urban and rural areas. According to Rural Sanitary Inventory² carried out by the Ministry of Environment, Housing and Territorial Development (MEHTD) between 2001 and 2002, only 56% of the rural population had access to some type of water supply. From that percentage, only 12% had access to drinking water, making this situation even worse. Additionally, 8.2 million inhabitants of rural areas do not have sanitation or sewerage units for the disposal of waste water.

Figure 2. National Water Supply and Sewerage Coverage 1996-2005

Year	National Coverage	
	Water	Sewerage
1.996	83.1	69.8
1.997	83.7	71.1
1.998	82.0	68.7
1.999	85.8	72.5
2.000	85.7	73.3
2.003	88.3	73.9
2.005	86.5	76.9

Source: Residential Survey - DANE (2003).

Furthermore, increases in coverage in Colombia have been lower than those of other countries in the region. According to the World Bank, Colombia has had a clear draw back in terms of water and sanitation coverage because it went from having averages above the world level in 2000, to increase the coverage of these two services en 6.4% and 8.8% respectively, while other countries in the region improved their coverage in 10% and 20%, respectively (UNICEF, 2005). Therefore, it will be extremely difficult to comply with goals set in the Millennium Development Goals.

Also, in a recent study held by the Domiciliary Public Services Superintendence (DPSS) on the Level of Satisfaction of Users (LSU)³ related with domiciliary public services, it was demonstrated that sewerage service obtained the lowest percentage (63.7%) among all public services considered in the study, while Users Satisfaction Level in the water sector was 65.68%. In general, satisfaction levels in services associated with water are low.

3.1.3. Drinking water quality

There are significant problems because over 50% of the population does not have access to good quality water. According to study made by DPSS, in which samples from 206 water utilities were taken, it was found that 144 of them (70%) do not provide water suitable for human consumption according to the water quality standards set by the

² On a sample of 67% of total population living in rural areas

³ Level of Satisfaction of Users (LSU) is a quantitative indicator from 0 to 100, being 0 the worst grade and 100 the perfect grade. This indicator combines two grades for each service: the impact or the importance of each moment of relationship between users and the provider, and the performance in each of those moments. In other words, establishing whether the service delivered by each utility is good or bad. The study was held between March and May, 2006 and approximately 7,400 public service users of rural and urban areas were interviewed in 130 municipalities.

Colombian law (Decree 475/1998). The analysis of this problem in terms of urban and rural population shows that approximately 12 million people living in urban headlines of municipalities do not have access to drinking water. In rural areas, the problem is even worse since only 12% of individuals living in such places have access to drinking water.

Water quality deficiencies are also demonstrated by the amount of municipalities receiving water services with good quality since only 18% of the 979 municipalities analyzed in a study made by the People's Advocacy Office had water considered suitable for human consumption.

The Annex 1 shows the situation of water supplied to the population of different departments of Colombia, according to results obtained in study held during the second semester of 2005 by the People's Advocacy Office.

3.1.4. Policies and Trends of the Water Sector

Policies and Strategies Promoted in the Sector

The decentralization model promoted in the world since the 80's was aimed towards the enhancement of political democratization processes and improving the efficiency and effectiveness in social services delivered to communities. At the same time, most of the countries with market economies reoriented the role of the Government in the provision of public services during the 90's, transferring a big share of such services to the private sector or to autonomous state companies, assuming a more active role in the regulation and surveillance of service providers. Therefore, the implementation of this new approach in Colombia had the objective of finding additional accumulation sources for international capital, as well as attracting new resources for upgrading and modernizing the existing infrastructure.

These new guidelines for delivering public services were implemented or strengthened in Colombia after the Constitution of 1991, passing on to municipalities the responsibility of guaranteeing its provision and opening the path for non-governmental entities participation. According to Uribe and Domínguez (2005), since 1991, the responsibility of guaranteeing public services provision remains in the State, but the entrance of non-governmental providers in this market is allowed. The Law 142 of 1994 completely re-defined the institutional and public services provision frameworks in Colombia, developing constitution mandates. As a consequence, new stakeholders and funding schemes began operating and important modifications occurred in terms of coverage, tariffs, quality and equity.

A key strategy to promote these policy approaches and new entrepreneurial models has relied on the emphasis given to efficiency and financial viability of service providers, sacrificing the objective of filling up service access gaps among the different regions and population groups. The significant meaning given to the economic component has the purpose of consolidating entrepreneurial schemes in provision of water supply and sanitation services, where private participation is a priority. Such schemes have been backed up by the current biased tariff model which favors financial viability (cost recovery through tariffs without additional considerations) above economic efficiency and ability to pay of users that increasingly support the funding of the sector. The reason to maintain the current tariff regulation, according to the General Accounting Inspector Office (GAIO) of Colombia is "the need to provide required resources to

utilities – through tariffs – in order to maintain service provision over the long run. Even though this is a legitimate reason, interests of users cannot continue being ignored and therefore it is necessary to find a regulatory alternative that addresses the needs of those affected by such high tariffs, without limiting required investments (GAIO, 2005).

On the other hand, it is important to say that such entrepreneurial strengthening through financial sufficiency also relies on subsidy schemes that help the poorer sections of society to pay their tariffs. In this sense, local governments are responsible for creating solidarity and re-distribution funds generated by two means: higher tariffs paid by well-off people and resources owned by the municipalities, which shall be used to subsidize the poorer parts of the population. However, lack of resources by local and central governments to finance such subsidies is recognized as another bottleneck for the sector, having this affected the strengthening of its utilities (NPD, 2005).

A balance of different water sector plans at national level since 1994 (year in which the Public Services Law was approved), shows that in spite of having had different emphasis, the objective of consolidating the new institutional and organizational framework has remained invariable. Hence, while the 1995-1998 Sector Plan⁴ emphasized on increasing coverage and improving service quality, it also set as a condition to create the enabling environment for modernizing and developing the sector, promoting entrepreneurial transformation and participation of the private firms and communities in service provision (NPD, 1995). On the other hand, although the purpose of the 1999-2002 Sector Plan was to support economic reactivation and employment generation through the construction of strategic works, it conditioned the national government's budget support to the compliance of entrepreneurial modernization actions (NPD, 1999). Likewise, the policy strategy of the 2003–2006 Sector Plan is to “continue with the promotion of private sector participation and consolidation of the regulatory framework”, in which the correction of deficiencies in tariff methodology is one of the main objectives, attempting to make entrepreneurial activity financially viable, but keeping in mind the ability to pay of users, which has been affected (DNP, 2003). Precisely, in order to continue with the institutional consolidation policy after creating Law 142, institutions in charge of the sector (initially, the Ministry of Development and currently the MEHTD) decided to structure the Entrepreneurial Modernization Program aimed to strengthen management capacities of service providers and support privatization processes (an analysis of this program is included in Chapter 4). An important part of the strategies suggested by the aforementioned plans is the financial consolidation of utilities, given that to the extent they are financially feasible, their management strengthening will be facilitated. In general, we can observe that most of the entrepreneurial strengthening from different government plans depends on the promotion of private schemes for water and sanitation management, considering that by definition this model has a tendency towards service management efficiency.

Likewise, drinking water and basic sanitation issues have been part of development plans of different departments and municipalities. In this sense, a study developed by the General Prosecutor's Office of Colombia and UNICEF found out that most of municipal and departmental development plans (90%) included drinking water and

⁴ Each Sector Plan corresponds to a four-year Government period.

basic sanitation topics, showing the sector's priority within local government policies (GPO-UNICEF, 2005). However, the same study establishes that the highest priority for these territorial entities is to increase coverage, leaving water quality improvement issues (drinking water or water treatment plants) to be solved later (See Annex 2). The national plans also consider universal access to water and sanitation as the main goals, leaving water and waste water treatment as a secondary objective.

This analysis also shows that municipal and departmental development plans reflect very clearly the orientation of national sector policies since they do not include components associated with capacity development, such as organizational/institutional development or human resources improvement, and rather include technical aspects related to coverage and secondly, with drinking and waste water quality.

Policies perspectives and future sector orientation

Policies that will determine future water sector performance can be extracted from analyzing a series of nationally generated documents that have had some influence from international agreements signed by the Colombian Government. In general, these documents show a high degree of continuity with sector policies of the 90's (See Annex 3), with the proposal of deepening the institutional and organizational models emerging from Law 142, promoting private participation in service provision and self-financing, trying to correct limitations associated with tariff and subsidy schemes. A positive aspect of future policies guidelines seems to be their coherence since a vision with goals, sector regulations and new proposed dispositions (the Water Law) have been created, having a more or less clear definition of roles and functions. Likewise, these policies are also considered in departmental and municipal plans. However, the two most important weaknesses seem to be the lack of a clear identification of resources that would allow carrying out these policies and the absence of a proposal of indicators that permits to control and follow up its compliance.

Strategies to achieve such goals are basically three: Optimizing financial sources, institutional development and adapting the sector entrepreneurial structure. In the first case, the strategy is aimed towards giving clear signals for allocation of economic resources at central level (General Participation System –GPS) which leads to entrepreneurial transformation of provider organizations in the cases in which this has not occurred, and that it tries to guarantee financing of subsidies for poorer population strata. With regards to tariffs, the purpose is to adjust the methodology in such a manner that included costs correspond to those of the efficiency and to the ability to pay of users. However, in order to guarantee financial feasibility of utilities, it is necessary to have a better focus on subsidy beneficiaries through new stratification definitions and basic consumption reduction. This element shows again the bias existing in policy makers who usually try to favor the entrepreneurial sector against users.⁵

The institutional component is related to capacity strengthening and therefore tries to consolidate MEHTD programs, to strengthen DPSS and Regulatory Commission for

⁵ Economy literature denominates this phenomenon as “capture of the regulator” and occurs in cases in which several existing interests at stake, one of the pressure groups is able to impose their point of view by overvaluing their arguments. The final result might be an exaggerated protection of interests of a determined group causing a negative effect on others. (GAIO, 2005).

Water (RCW), to generate institutional changes required for better resources allocation to municipalities and to establish mechanisms that may improve information collection, its processing and utilization in the sector.

Additionally, there is a plan to develop more agile processes for entrepreneurial transformation and specialization of service provider utilities through joint activities from three entities: The MEHTD Entrepreneurial Modernization Program, the DPSS inauguration processes and development of liquidation functions of inefficient public utilities by RCW. The main goal of this strategy is not only promoting private participation, but also searching for regional schemes that capture economies of scale and reduce transaction costs in the regulation and control processes, allowing intermediate level (departments) to play an important role. This by having the possibility of receiving part of the transfers from the central Government to promote this type of schemes for the provision of water and sanitation services and support smaller municipalities.

The plan is also to continue with technical assistance and training programs for water supply systems in rural areas and the promotion of service delivery schemes through associations in sites with less than 5,000 inhabitants and micro-enterprises and community based utilities in sites with a population between 5,000 and 20,000 inhabitants, accompanied by support and cooperation generation networks, as well as encouraging them to complement one another. (NPD, 2005a).

The National Congress of Colombia is presently discussing the “National Water Law” Project, which will surely have a mid term impact on the sector since it proposes important changes in institutional water management structures, including the creation of two entities: the National Water Council and the General Directorate of Water Resources⁶. Specifically, the main changes proposed are associated to the institutional framework and to the possibility of having private management through water resources concessions.

3.1.5. Water sector financing

Law 142 of 1994 considers that service financing (investment, operation and management) should be obtained mainly from three sources: i) Tariffs to end users, including a fixed charge, a consumption unit charge, and connection fees, which operates jointly with a solidarity scheme based on subsidies granted to low strata population, ii) Resources allocated by the Nation, through MEHTD and the General Participation System (GPS). Law 715 of 2001 established that 17% of resources that the Nation’s transfers to territorial entities as part of the GPS shall be directed to investments in infrastructure for drinking water and basic sanitation and to subsidies provided for such services. With regards to municipalities competencies, this Law has

⁶ Functions of these two institutions would include:

National Water Council: Recommend the adoption of policies for integrated water resources management (GIRH); recommending development of research focused on the protection of water resources and promoting integration between information related with GIRHA and the Environmental Information System for Colombia (SIAC).

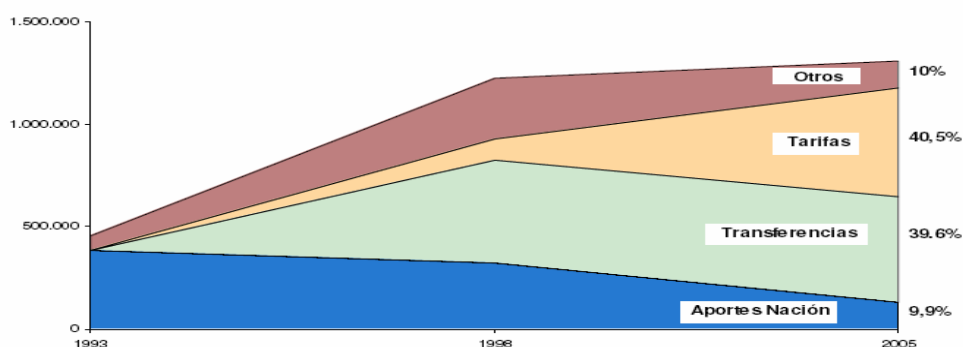
General Directorate of Water Resources: In charge of providing technical assistance to the National Water Council and propose policies, plans, programs, projects and regulations in terms of GIRH.

explicitly established responsibility of the Nation in the building, expansion, rehabilitation and improvement of public services infrastructure, done either directly or through third parties. iii) There are other funding sources, such as resources from Regional Autonomous Corporations that receive environmental taxes that may be allocated to the sector, plus the own income of departments and royalties received from exploitation of natural resources such as oil and mining activities.

The National Planning Department estimates that resources invested in the sector have increased three times between 1993 and 2005 (DNP, 2005a) (See Annex 4). The dynamic of different sources reflects two main aspects (Graph 3): (a) The deepening of sector decentralization process, not only with respect to responsibilities, but also in relation to resources, with substantial increase of transferences from GPS' to municipalities; and (b) Tariffs paid by users became an important source of resources, after application of tariff methodologies starting in 1996. However, as mentioned before, financing through tariffs starts giving signs of being exhausted since in many places they begin to get closer to goal tariffs set by the Law of Domiciliary Public Services. This is also affecting the ability to pay of users, especially the poorer, due to the cancellation of a significant part of extralegal subsidies. This is also reflected in several situations in the reality since, for example, in a study made by Cinara in 2006 in 9 sites of the rural area of Buga, it was found that water and sewerage tariffs generally represent an expense higher than 10% of the total home income, being this extremely high compared to international standards that propose payment for these services shall not exceed 2.5% of said income.

On the other hand, the financing scheme that is being consolidated, based mainly in tariffs paid by users, is an element that makes difficult to bring the access services gaps among regions and social groups, precisely due to the fact that low ability to pay of users is a limiting factor for financing through this mechanism.

Gráfico No. 2 - Fuentes de Inversión Anual en el sector



Las cifras para 2005 corresponden a un promedio entre los años 2003-2006
Otros: Incluye contrapartida local y regalías

Fuente: DNP.

Graph No. 3. Sources of annual investment in the Water Sector
Source: DNP

Although resources directly granted by the National Government were reduced in a consistent manner with the decentralization process, the amount available has an important strategic value when allocated to specific projects that have demands linked

to entrepreneurial transformation processes. According to NPD, that would allow facilitating political and social acceptance for the entrance of specialized operators in other municipalities. In that way such resources have become a strategic instrument to introduce privatization schemes in the sector, being promoted at national level since in general such models are not well accepted by many users or local governments who fear tariff increases and loss of governability.

An element that has lost a lot of dynamism in the sector's financing is credit that had been channeled through FINDETER, the Territorial Development Financing Entity. Adequate financing of sector requires access to credit sources and long term capital to be able to finance high investments required currently, which are recovered in a relatively long period of time. FINDETER had been channeling resources from multilateral banks with loans at 12 or 15 year terms and these were allocated to infrastructure works through the financial system, with long maturity periods. These resources had additional benefits, such as technical assistance and demands of institutional and tariff adjustments. Presently, there is a type of credit substitution process by GPS transferences.

In summary, it is necessary to be careful with supporting a very high percentage of the sector financing through tariffs since this scheme has limitations, not only by the users' ability to pay, but by the necessary promotion of equity and solidarity that every policy instrument shall have in a country as uneven as Colombia. Also, for institutional and organizational strengthening, financing through tariffs has limitations since many of entrepreneurial modernization allocations cannot be totally charged to users.

A potential problem in the sector financing seems to be related with the use of resources, especially in municipalities. According to the National Planning Department (NPD), in 2004 there was evidence of uses not planned by law in the execution of resources originated by the General Participation System, such as river basins reforestation, purchase of land, slaughterhouses adaptation, and operation expenses (there are also some municipalities registered that spent their resources in court, on legal processes and payment of public services). The effect of improper use of resources has contributed in not being able to obtain the expected outcomes in relation to water and sanitation coverage.

A recent measure by the Colombian Government (August, 2006), tries to allocate 8.2 trillion pesos through departments, probably due to weaknesses municipalities have in resource management and the need to generate profitability conditions (economies of scale) for the private sector, in such way that they promote water services delivery through private operators participation. The 8.2 trillion pesos budget will be allocated to technical, legal and financial support in order to promote this regional scheme of public services provision. Resources are mainly originated by transferences (2.5 trillion pesos), the creation of the National Drinking Water and Basic Sanitation Fund (2.5 trillion pesos), credits and cross entries (2 trillion pesos) as well as the Public Hearings Fund (1 trillion).

3.2. Organizational Structure of the Water Sector in Colombia

At the beginning of the XX century, specifically between 1910 and 1930, water and sewerage service provision was done by the Government in a centralized manner (Dominguez and Uribe, 2005). During the 50s, the Institute of Municipal Promotion (INSFOPAL) was created and became responsible for financing, planning, designing, building, operating, maintaining and managing services of all municipalities, while the responsibility of providing these services in rural areas was delegated to the National Health Institute (NHI), through the Rural Basic Sanitation Program (RBSP).

The origin of the current institutional framework of drinking water and basic sanitation sector goes back to 1987, when Decree 77 was issued closing INSFOPAL and initiating the institutional reform and decentralization processes that gradually translated competencies, then carried out by RBSP of the National Health Institute, to the different departments and municipalities. RBSP had offices and promoters that organized work with communities all over the country but the decentralization process was not accompanied with the level of support required for its proper functioning (See Chart No. 1).

Chart 1. Decentralization with difficulties

Decentralization has transferred responsibilities (education, health, water and sanitation) to municipalities, but has not transferred the required resources. Municipalities by themselves are not capable of taking care of urban and rural areas water and sanitation needs (Mayor of Marinilla);

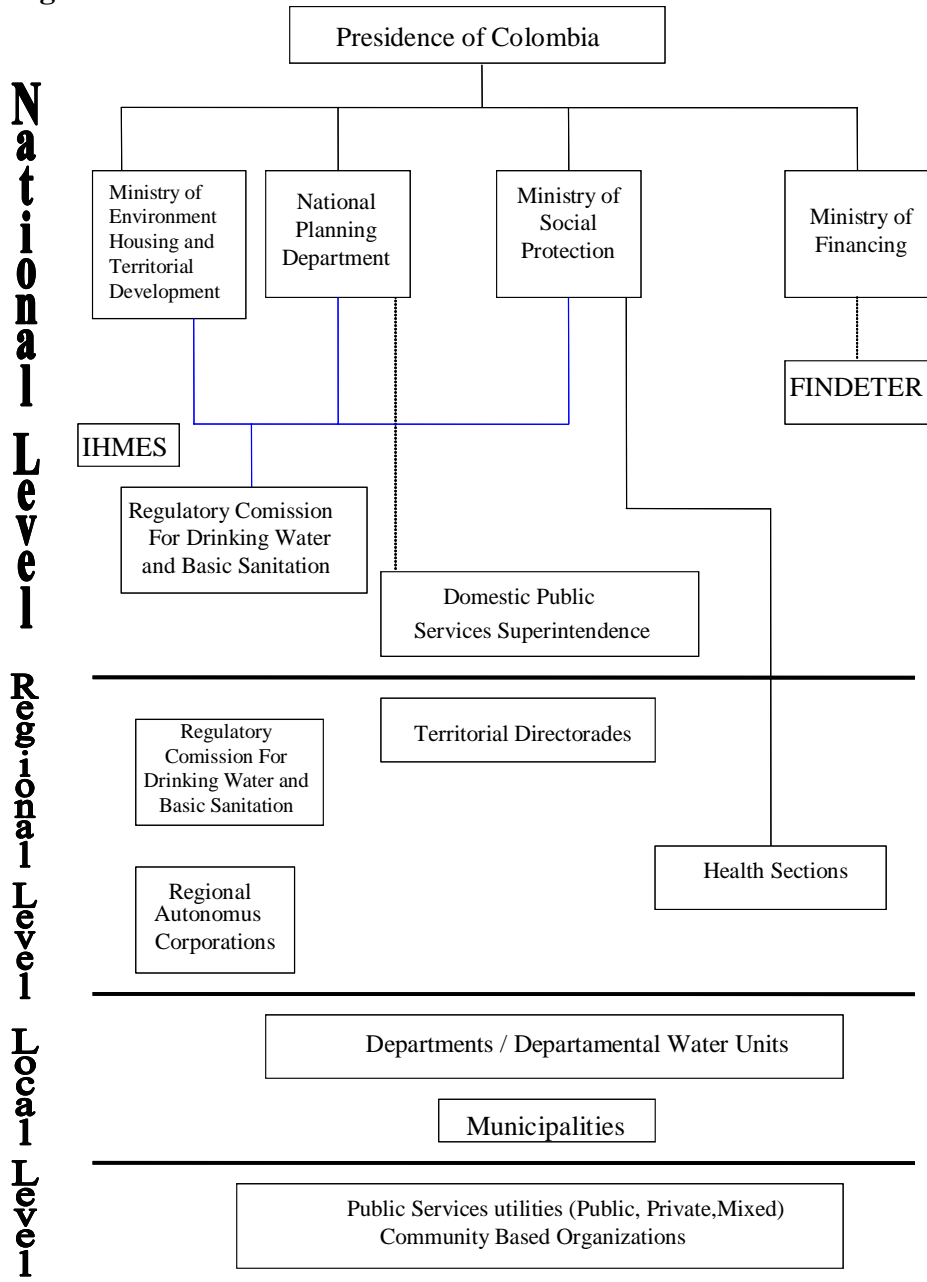
Rural locations are highly benefited by the political position of their leaders in municipal councils. For example, "in Togoromá I received higher priority in the municipal plans of the municipality of Docordó in Chocó, because the mayor was from that rural zone of the municipality" (local Consultant), (adjusted to García, 2003)

Likewise, Political Constitution of 1991 and Law 142 of 1994 introduced fundamental principles related to the domiciliary public services nature, delivering the responsibility of guaranteeing water and sewerage services to municipalities and granting acknowledgment as service providers to non-profit organized communities, as well as private utilities. However, after 15 years of the new constitution, the MEHTD accepts that it has not been possible to consolidate responsibilities at regional level, being such level the one in charge of providing municipal and local support. Consequently, it is necessary to review current institutional frameworks.

Colombia's water sector presently has a large amount of institutions having specific functions to be developed for the provision of water and sewerage services, many of which are related to capacities strengthening. Among state type stakeholders, there are at least 8 institutions that work at national level (See Figure No. 1). Meanwhile, at regional and municipal level there are also a series of institutions that serve as intermediaries between national stakeholders and service providers, many of which are regional entities depending from some of national type (such as regional direction offices of DPSS). Finally, providers are the stakeholders that play their role at the closest level to the community.

An analysis of state stakeholders and service providers functions and profiles at national and intermediate level will be developed in this part of the study.

Figure 1. State Institutional Structure of the Water and Basic Sanitation Sector



3.2.1. National state stakeholders

Role definition and responsibilities

The current institutional structure of the sector is based on the separation of roles between the National Government in charge of sector policies, regulations and control, and municipalities, responsible of assuring efficient service provision. The main state stakeholder at national level is MEHTD, which is in charge of designing policies, plans and programs in the sector through the Directorate of Drinking Water and Basic Sanitation (DDWBS). In the meantime, regulation and control competencies executed by the National Government, including surveillance, inspection and control of water and sewerage utilities has been assigned to the DPSS meanwhile regulation functions in terms of tariffs, market and monopoly regulations are under the umbrella of RCW. Table No. 3 shows a summary of main functions of State institutions working in the national water sector.

Table No. 3. Functions of water sector institutions at national level on construction and service provision

Institution	Responsibility of construction work	Responsibility of service provision.
MEHTD - DDWBS	Setting of policies, plans and programs Coordination of sector entities Technical regulations of the sector Work financing through EMP	Setting of policies, plans and programs Coordination of sector entities Strengthening of minor municipalities providers ECP Formation of private companies (EMP) Formation of community small size companies (SCEP)
NPD	Follow up and assessment of investment policies, programs and projects	Design and setting of sector policies Technical assistance to municipalities and departments Support functions of RCW and DPSS
Ministry of Social Protection	None	Surveillance and water quality control for human consumption
Ministry of Finance	Design of the national general budget Allocation of resources from GPS to municipalities	Allocation of resources to GPS municipalities
FINDETER	Work financing Advise on design, execution and manager of construction, expansion and replacement of infrastructure projects	None
IHMES	None	Generation of data and environmental information Elaboration of studies, research, inventories and information management activities
RCW	None	Design of cost and tariff methodologies Service provision quality parameters Monopoly regulations Management and providers efficiency assessment methodology

DPSS	None	Quality surveillance of water and sanitation service providers Surveillance of providers' compliance with standards and technical regulations
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Source: Authors (2006)

Annex 5 presents the detailed functions performed by different institutions of the drinking water and basic sanitation sector.

As part of policies to reduce the State's size, the National Government has carried out personnel re-structuring and reduction programs in institutions such as MEHTD. In the case of DDWBS, the section in charge of working with municipalities with less than 50,000 inhabitants and rural areas (there are more than 1,000 municipalities) has only five officers, making it impossible to effectively comply with capacity development processes at intermediate level.

3.2.2. Intermediate level stakeholders and their profiles

The intermediate level in the Colombian water sector consists of a series of stakeholders characterized by being part of the State, having regional presence (municipalities, departments and their departmental health secretariats), by belonging to national level decentralized offices (such as the south western PDSS Directorate), by arising from the public or private sector, and acting in education fields or being groups of professionals (Universities and ACODAL), by being part of international entities that develop their work at local level (UNICEF), and also by making part of civil society organizations created to defend their rights (AQUACOL). Additionally, there are consultants working as advisors in municipalities, departments and water and sewerage utilities and with tools, materials, equipment, spare parts and raw materials suppliers.

Municipalities

Small sized Colombian municipalities that, as previously mentioned are the majority, generally do not have an independent entity in charge of aspects related to the water sector at local level. Therefore, in many of them the responsibility of taking care of the water supply area is assigned to the Planning Office or to Health or Public Works Secretariats. Besides this, there are also problems with the inadequate profile of many of the officials responsible for the water sector since many of them do not have working experience in that field, have recently graduated as professionals or have never worked in the sector. Many of these officials obtain their jobs as consequence of bureaucratic political agreements. Also, once these officials are able to be acquainted with their positions, they are changed to different jobs since the average duration of municipal management terms is 2 years.

Low management capacity and technical knowledge of local officials does not allow them to have a clear vision of problems and solutions in the water sector, making it extremely difficult to support service providers (See Chart 2).

Chart No.2.Capacities in Municipalities to give support to service providers.

The municipality has very low capacity to support service providers for multiple reasons. According to Engineer Fabiola Berón, “it is very difficult for municipal administrations to be Advisors...Major offices have many limitations and we detect many problems regarding knowledge of legal aspects...there are many officials that do not know how to create the solidarity fund, what it is for, and do not know stratification methodology nor the fact that companies have to have uniform conditions in their contracts, having large amounts of information and regulations that are not known even in the same municipal administrations”.

Departments

The situation in the departments is similar to that of the municipalities with the lack of a clear definition on which section is responsible for the water supply sector. In many cases, this institution does not even exist. Additionally, we have to include loss of political and financial power in departments compared to municipalities, basically due to transferences of resources to the latter.

Using the Department of Caldas as an example, the water sector is under the responsibility of only one professional, a civil engineer with four years working experience in the sector, who does not have the capacity to respond to complex functions typical of the position she occupies, such as:

- Coordination and follow up of programs and projects related to water and basic sanitation sector in the department.
- Training, advisory and guidance of local governments (municipalities) and water and sewerage providers.
- Advisory and support to the Secretary of Housing in activities and elaboration of reports.

Besides, department functions are hampered by problems arising from the relationship with municipal and national authorities responsible for the sector. In the first case, due to lack of diagnosis and a properly trained and committed staff, as well as the fact that they do not know the regulation . In case of the national level, represented by MEHTD, reasons are the lack of clear policies regarding the sector, permanent rotation of responsible officials and its specific relationship with the department, limited to the socialization of policies and standards.

However, in spite of these problems, some departments have interesting strategies to support municipalities and water and sanitation service providers. For example, the Department of Caldas is consolidating a Program of Capacity Strengthening in the Development of Sustainable Drinking Water Systems in Rural Communities, probably being pioneers in the country. A pre-diagnosis of the water supply conditions was done as part of this program, including 37 rural water supply systems that serve 90 communities belonging to 17 municipalities. Likewise, based on data obtained from the pre-diagnosis, an information system known as “RURAL WATERS OF CALDAS” was designed. This information system contains data on micro-basins, infrastructure and management of water services in rural areas. This program will continue with three phases in which it is expected to make a diagnosis and participatory design of Multi Stage Filtration Systems in 10 municipalities. Afterwards, the construction of these systems will be accompanied, consolidating community management of the systems and finally summarizing the developed experience.

Another good example of support for rural areas is the Rural Water Supply Program (RWSP), which has been promoted by the Government of Valle del Cauca, with participation of municipalities, the regional environmental authority of the department (CVC) and a private entity (Coffee Growers Committee). RWSP has supported the construction of water supply systems without including treatment plants, but considering some strengthening activities for the community organizations in charge of managing the systems, especially in topics related with tariffs and accounting. RWSP's financing is done with resources received from governmental entities (department, municipality and CVC), while the community is responsible for co-financing 30% of infrastructure work, whether it is done through cash money resources and/or with contribution through non-qualified hand labor.

Regional South-West Directorate of the Domiciliary Public Services Superintendence (DPSS)

DPSS has 5 regional offices in Colombia and their function is the surveillance of the quality of water and sanitation providers, as well as providing legal, institutional, commercial, technical and operative advice to small scale water utilities (with less than 2,500 subscribers).

One of the main problems of the DPSS' regional offices is the lack of staff. In the case of the South-Western Regional Office located in Cali, there are only two professional engineers with enough working experience in the water sector, that have to cover the entire territory of three departments, including Cauca, Nariño, Putumayo and Valle del Cauca. In an interview, Engineer Fabiola Berón from the South-Western Regional Office, stated that the number of companies in rural areas in her jurisdiction is still unknown. Another critical problem is lack of information in different areas, for example establishing quality of water supplied to the communities.

Although by law, providing training to personnel working in the water utilities is not included as part of the functions to be carried out by DPSS, officials from this office declared that within their limitations they help people from water utilities to be included in courses and workshops programmed by MEHTD. Alliances with SENA and universities have also been created in order to offer training workshops in which DPSS has an advisory role. Regional Offices play a vital role regarding capacities strengthening, especially in relation to improvement of standardization, legal, administrative and technical aspects of the service providers.

However, associations such as Aquacol consider DPSS's role critical because they believe that once you are registered in it, in spite of being a legal requirement that demands an annual payment, it does not represent any practical benefit for water utilities. Also, according to the vision of the President of Aquacol, follow up parameters of DPSS's are very demanding for rural communities or marginal urban utilities to comply with due to the fact that they were designed having in mind large, urban companies.

Association of Community Public Services Providers Organizations (AQUACOL)

AQUACOL is a clear example of civil society representation in the water sector. It is an organization that agglutinates 30 community based utilities that provides their services in the departments of Cauca and Valle del Cauca. Some of them have up to 10,000 water service users, while others do not reach 50 subscribers.

The search of capacities for associates in technical and legal aspects is clearly identified by the President of the organization as part of his responsibilities, but Aquacol also tries to defend the community right to participate in the execution of local water and sanitation projects.

One of the largest problems encountered by Aquacol is financing its operating costs. This sets a limit to its impact due to the great amount of members that have to be taken care of. In order to solve this situation, each member has to pay a membership fee, but also management entities have adopted the strategy of sharing knowledge among themselves, creating Learning Community Centers. These centers are some of Aquacol's partner organizations that are strong on specific water supply topics and therefore become training and assistance centres on such topics for the rest of communities. Presently, 4 community learning centers have been designed and are undergoing an internal strengthening process to be able to assume their roles⁷.

One of Aquacol's strengths is precisely that it generates economies of scale at the moment of the negotiation of training packages for its associates and the capacity to call the attention of municipalities so infrastructure works have the corresponding community inspection and accompaniment. Aquacol has also promoted a gender approach since women have started gaining opportunities to represent their communities. The secretariat, treasury and some other member positions are held by women. "We have had incidence showing our associates that women have greater summons capacity and we believe that in the case of water supply system management, they are more honest and transparent", declares Mr. Saavedra.

Regional Autonomous Corporations (RAC)

RACs are regional level environmental authorities in charge of managing water resources through water concessions. In Colombia there are currently 34 RACs. In the specific case of the Regional Autonomous Corporation of Valle del Cauca, (CVC) and the Association of Community Public Services Providers Organizations (AQUACOL), their relationship has been based on availability of technical and legal information on water concessions and environmental licenses. Short training programs have been offered through workshops, using a mobile unit with adequate personnel and learning material such as booklets, videos and posters that are easy to understand and attractively designed. RACs are criticized because they lack a real work program focused to communities (for example, water councils responsible for watersheds, where generation of water for supply systems occurs).

Consultants

Consultants of the water sector in Colombia have different educational background, being mostly engineers (sanitary, civil and computers) and business administrators. It is an association with a work approach more focused towards technical aspects than towards social issues, presenting weaknesses in handling of economic, environmental and educational components of the projects. Their working methodology is not very participatory since it is limited to informing and advising the community, delivering final products, but does not have true feedback with end users.

⁷ This process is being strengthened by Resources Centers Development Programs sponsored by IRC of the Low Countries and executed by Cinara Institute in Colombia.

Main working areas of consultants are the design and construction of works and elaboration of water and sewerage master plans. Legal advice has also increased as part of services provided by consultants, especially in relation to water utilities creation, the elaboration of cost and tariff studies, and legal terms for the subscription of contracts, considering the lack of knowledge and problems encountered by municipalities in the application of standards. Hiring consultants for training purposes is not very frequent. When consultants intervene in training they generally contribute in technical matters, “to ensure the system they have done or executed works properly”.

Although there are highly experienced and specialized consultants, in smaller municipalities, due to budget constraints, some consultants have low technical capacity and experience. Therefore, they are invited to make free designs, but in many opportunities these are copies of designs that have already been made in other locations, “with the promise of fighting and searching for the location mayor or city council to approve the work and to include it in their next budget allocation with resources provided by the nation, through Law 715”, as mentioned in interview with Mr. Arlex Saavedra, President of AQUACOL. Risks taken by consultants are not as high as initially assumed because this situation is reached after a “previous agreement” has been made with local authorities.

According to Mr. Saavedra, work quality and effectiveness are closely linked to community participation. For example, in the case of communities that are organized and have cohesion, they make an impact in the design and construction processes of the water supply systems. As Mr. Saavedra points out “you can obtain better results than in those where the consultant only relates to municipal authorities”.

Material Suppliers

Spare parts and material suppliers for the water sector in Colombia are basically represented by the private sector and cooperatives. There is a huge number of suppliers and most of the time is easy to get access to them. AQUACOL has been able to obtain discounts between 40% and 55% in the purchase of material, as in the case of PVC tubing, when payments are made in cash.

Universities

Universities are generally related to the strengthening of capacities through the development of human talent, and through formal and informal education courses. An investigation regarding the main universities of Colombia that have education programs related to the drinking water and basic sanitation sector, found out that 43 universities have different levels (technical, undergraduate and post-graduate) of academic programs that in some way approach these topics (See Annex 6).

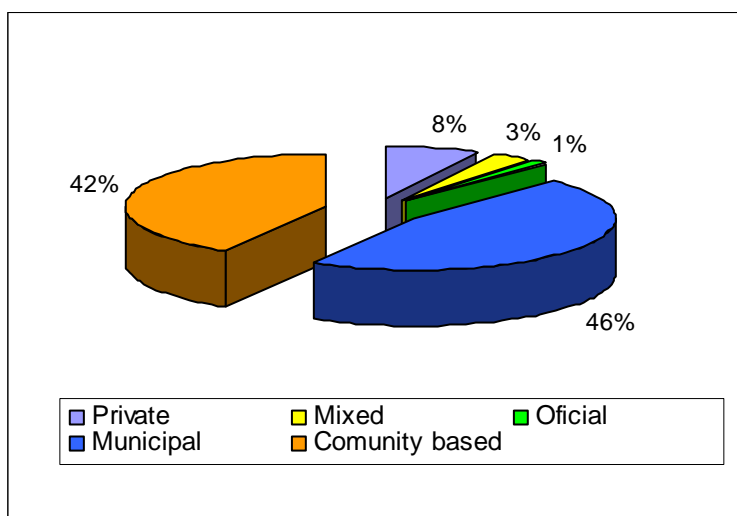
The following comments may be made about the different programs' curriculum:

- Most of the programs appear under the title of “Environmental Engineering”, where drinking water and sanitation issues are only one part of the contents that includes other topics such as air quality, soils and solid waste management. The characteristic of the term “environmental” is very broad and there is no profound education, especially in undergraduate programs.
- Priority is given to topics from a technical perspective (quality and water treatment, hydraulic structures, etc), and not to a social issues.
- Academic programs do not analyze real situations and needs of the country because

the majority of them have a theoretical perspective instead of a practical one.

3.2.3. Water and sewerage service providers

Since the beginning of the 90s, water sector policies have had the objective of facilitating the participation of the private sector in the provision of water and sewerage services, pretending it would evolve by itself towards an entrepreneurial management of such services. However, although there has been noticeable growth in the amount of service providers, because according to NPD (2005) information, there were approximately 12,000 organizations by 2005, direct provision by municipal companies continued being the prevailing national option (46%), followed by community based schemes (See Graph 4). In the meantime, only 8% of the providers were from the private sector, which proves that their operation is not a generalized practice in the water sector.



Graph 4. Type of water companies in Colombia
Source: CONPES 3383 (2005)

Out of the existing 12,000 providers, only 859 (7%), have been registered in the DPSS. Based on this, it can be seen towards which areas the different types of utilities are directed. For example, out of the 358 existing community based organizations, about 271 serve rural areas, while out of the 65 private operating companies, 55 cover municipalities with more than 50,000 inhabitants. It is clear that private sector participation is easier in larger locations and in urban areas, where profitability levels can be obtained by charging higher tariffs. Rural areas are not attractive for the private sector due to the generally low ability to pay of users.

4. STRENGTHENING OF CAPACITIES IN THE WATER SECTOR

Capacity development is not a new topic in the water sector in Colombia. Since the late 80's and throughout the 90's, coinciding with the decentralization and institutional reform processes of this sector, three programs trying to guarantee sustainability through institutional strengthening and water service provider entities were implemented.. The first one is the Water and Sanitation Program WSP (1989-1996), promoted by the Royal Embassy from The Netherlands. The second one is the Water Culture Program (WCP) created by the disappeared Ministry of Economic Development (MDE), which produced the first booklet aimed towards guiding the creation of water and sewerage utilities⁸ and, finally, the National Sustainability Program, developed between 1997 and 1999, by Findeter and MDE, with the participation of the Cinara Institute of Universidad del Valle as facilitator. These programs are characterized by their response to government initiatives, which reflect that Colombia has been a country that has always had a strong level of institutionalization in water topics, reason why programs and projects with greater national coverage have always been managed at central level.

Therefore, presently programs related with capacity development maintain the characteristic of having been created as an initiative of the central Government, which is the coordinator and in many occasions, the main funding source. Programs that will be analyzed in this part of the case study are the five most important initiatives of capacity development in Colombia because of their national coverage and inclusion of rural and urban areas:

Entrepreneurial Culture Program (ECP)
Entrepreneurial Modernization Program (EMP)
Labor Competencies Certification Program (LCCP)
Water Culture Program (WCP)
Community Small Enterprises Program (CSEP)

4.1. Entrepreneurial Culture Program (Ecp)

ECP emerged as an initiative of DDWBS, presently the MEHTD, which rescues lessons learned from the WSP, Water Culture and Sustainability Programs, and started operating in 2000. ECP is directed towards water service providers in municipalities with less than 12,500 inhabitants, which represent almost 80% of total municipalities of Colombia. This shows its importance in terms of national geographic coverage.

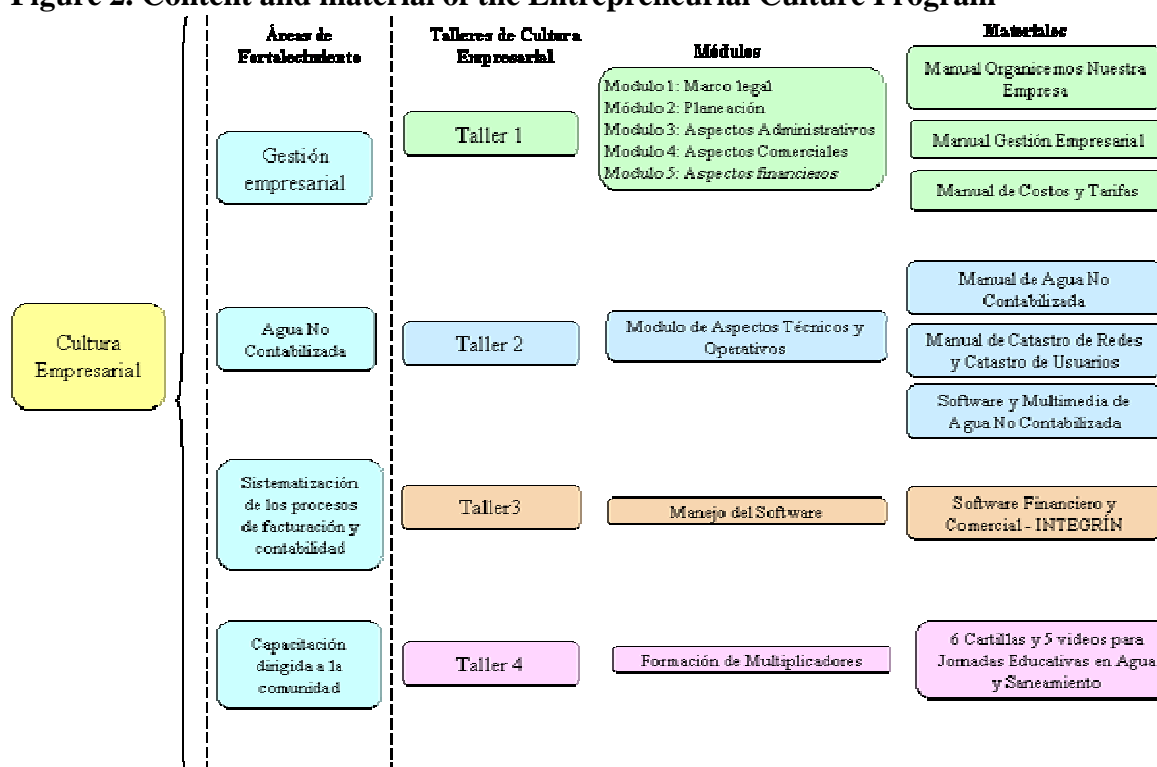
The main objective of ECP is to promote modernization of water service providers in small municipalities and rural areas, through a strategy including technical assistance and training in four different areas: entrepreneurial management, non-accounted for water, automation of invoicing and accounting processes, and community training. The modernization process starts with a management self-evaluation made by providers, considering 99 indicators, with which MEHTD grades them from 0 to 1,000 points, according to the following aspects: Institutional (300), commercial (200), operational (180), financial (150), administrative (100) and technical (70) aspects. A grade result

⁸ Booklet "Let's Organize our Water and Sewerage Company" in circulation in 1996.

above 600 points represents an efficient management and if the grade obtained is higher than 800 points, it represents excellent management. Efficient management is awarded by giving Integrin, a software that is used for invoicing and water services collection, as well as the subscription of agreements with municipalities to finance infrastructure work.

Training begins after the assessment process is carried out and is done through four workshops containing a series of modules and training material (booklets with some formats), which are given out to the companies so they apply them in their different activities (See Figure 2). Training is provided to managers, administrators or community leaders in charge of water and sanitation utilities and after the first workshop, they shall be able to generate an improvement plan. This plan has a quarterly follow up, when the data is sent to MEHTD, and compliance with such agreements is duly certified..

Figure 2. Content and material of the Entrepreneurial Culture Program



Source: Tamayo and García (2005)}

By December 2004, ECP had included 329 providers of which 217 (66%) had reached an efficient management level, while another 102 (31%), had an excellent management grade. This means that during that year, ECP had only had incidence on a limited amount of providers, when considering there are approximately 11,000 community organizations providing services to rural areas with less than 12,500 inhabitants. This may be related to the fact that initially national training was assumed directly by MDE officials. One of the officials declared “we are two officials in charge of following up for 600 or 700 municipalities” (Tamayo and García, 2006). Due to this lack of operation capacity, ECP made modifications, deciding that training could be provided directly by regional or local entities such as departmental water units, NGOs, universities or

different types of professionals that would become multipliers of the program's own methodologies and instruments. An additional achievement of the program was that during 2003 and 2004, 64 and 66 companies were strengthened vs. the goal of 49 and 59, respectively .

In spite of low coverage by ECP, this has been considered one of the most important efforts in strengthening water and sanitation service providers in the country since according to Tamayo and Garcia (2006) "it is the only institutional response for small municipalities". Besides, the program has demonstrated having the following series of strengths:

- Program contributions to management improvement of those participating in it is evident since during an evaluation done by Cinara, out of 6 companies providing water services in smaller municipalities, companies went from an average of 300 points to more than 900 in several cases (ibid. Op. Cit). Also, companies' advance was noticed in all areas (institutional, administrative, commercial, financial, operational and technical). ECP has allowed providers to become acquainted and implement standards and laws, as well as letting them develop processes in areas such as the commercial area, using provided material (formats) for logging and updating of subscribers, invoicing and consumption measurements, etc. Also, tariff studies were done and customer service offices were created.
- ECP has provided valuable training material since it has allowed many companies to implement some of the formats in their work practice. Training booklets are written in a language easy to read and understand by company managers. According to one of the participants in the evaluation made by Cinara, "the program delivers very valuable tools that would make companies 100% successful in case they could be applied".

Apart from all these positive aspects, ECP has also presented a series of problems, such as the following:

- The program's follow up is very weak because grading is based on data sent by the provider to MEHTD, not allowing in situ proving that utilities are complying with their improvement plans. That is how a grade that may represent efficient management may be a misleading grade because, as stated by García and others (2006) "obtaining an outstanding grade in the Ministry is not synonymous of providing a good service because there might be a company such as Valparaiso, graded with 700 or 800 points, and people are still drinking muddy water".
- ECP has been able to mainly strengthen legal aspects, but has given less importance to technical operation improvement of systems through financing of works. Hence, many times administrative improvement does not result in a substantial increase in quality of service provided to users, especially when water supply problems have a strong technical component.
- Training strategies mainly directed to company managers is good but has the weakness given by the fact that managers generally lack practical knowledge of operation and technical routines, which are a significant part of the strengthening package. For this reason, it is fundamental to include operators and plumbers.
- Training material is highly complex for community organizations since in many cases the formats and the invoicing and collection software are not applicable to reality. This occurs because they were designed considering their implementation

in small municipal type utilities.

- The gender approach is absent from all ECP strategies. Therefore, it can be seen for instance that differences between men and women are not considered in the training nor in looking for woman's equal participation in different courses. The same occurs with material which in general uses a language and illustrations with very limited woman participation.
- Lack of continuity by those receiving training is in many cases a problem for the implementation of program's lessons since generally municipal type utilities managers are changed when the mayor is changed.

4.2. Entrepreneurial Modernization Program (Emp)

Different from ECP, which tries to strengthen small municipality providers, this program has the objective of constituting the largest amount of private operation companies for water and sewerage supply, to mainly serve intermediate size municipalities (between 100,000 and 500,000 inhabitants) and later to municipalities having between 12,000 and 300,000 inhabitants. Specifically, EMP began operations in 1999, receiving support from the World Bank and is planned to finish by June, 2007. It initially had a total budget of US\$ 70 million (including a counter part of US\$ 30 million from the Colombian Government) for its execution and has tried to operate through the following four components:

- Component A: Infrastructure investments in participating municipalities
- Component B: Capacity strengthening of environmental sector management
- Component C: Water supply and hygiene policies development in rural areas
- Component D: Project management and training, technical assistance, studies and supervision of works related with different subprojects

For Component A, which intends to modernize water and sewerage infrastructures making investments facilitating operations of private providers, the results by October, 2004 were not very promising since only 16 operation contracts had been subscribed and only 8 new private specialized operators of the 246 set by PME as goal for starting operations in 2006, were connected. It is important to notice that the total 16 contracts added up to a total of \$516,000 million, out of which the municipality contributed with 35%, the country with 20%, the department with 11% and the operator with 34%. It is clear the program has strong intermediate level participation (department and municipality), in spite of being of national type, in terms of work financing, while it is the central level that controls contract assignment processes. Also, consultants play an important role since they are in charge of making technical and financial conditions' diagnoses in locations where the project will take place and of generating terms of reference for companies participating in biddings for operation contracts.

Also, Component B of the EMP includes strengthening MEHTD's organizational capacities as one of its priorities, as well as generation of analyses, studies and research that may help in generating a more enabling environment for decision-making processes, especially in environmental issues, for which it includes the following five operation areas:

- ⇒ Environmental Title I of Drinking Water and Basic Sanitation Sector Technical Regulations (WSTR), which included its design, edition and disclosure.

-
- ⇒ Analysis, design and implementation of a Sector Environmental Information module.
 - ⇒ Waste water management through the design, edition and disclosure of a waste water technology selection model⁹
 - ⇒ Special studies
 - ⇒ Additional aspects related to MEHTD's strengthening in topics related to environmental management, municipalities and environmental authorities training in WSTR management and strengthening of environmental management concessionaries.

Apparently, main results of this component seem to be the disclosure of WSTR during 2003, although there is no information available regarding its use in the design of works in the water sector. Likewise, MEHTD has tried to respond to its environmental institutional strengthening need by creating a water resource group in charge of including integrated water resources management aspects in all its work strategies. Finally, it was possible to widely reach the training goal in environmental and entrepreneurial management because out of 263 people programmed, 1,029 received training during 55 workshops held in 17 departments. (MEHTD, 2005).

A rural sanitary inventory was done as part of Component C. This is a key information source for decision-making and the design of plans, programs and projects for this area. As part of Component B, this is aimed to strengthen decision-making processes in the entire sector, through the generation of information. On the other hand, Component D is aimed towards providing support to the development of EMP by doing its financial resources management and administration.

4.3. Water Culture Program (Wcp)

General objectives of the Water Culture Program are to strengthen citizen and community formation and participation for water sustainable management, as well as contributing in the consolidation of citizen and community participation in development of environmental education strategies oriented towards sustainability of infrastructure and entrepreneurial systems in the drinking water and sanitation sector.

The program includes four education strategies: Educational Journeys on water and sanitation; Water Protecting Clubs; Basic School Sanitation and Hygiene Education and Community Participation in Water and Sanitation Projects.

The program transference methodology is very interesting because it starts with the agreement of work to be done with different types of institutions as service providers, municipal and departmental education secretariats, RACs, other public and private entities of the sector and even international entities such as PAHO, GTZ and UNICEF. Training workshops of three and four days of duration are developed and these become local multipliers of WCP topics. The program has developed a large amount of material, mainly booklets, guides and modules for process facilitators, multipliers and school teachers, as well as brochures, posters and drawing books to be used by students.

⁹ This waste water technology selection model is being presently developed by Cinara Institute.

Disclosure is the following step, when WCP results are given out on the celebration of the world and national water days, making meetings with water protecting clubs and distributing the yearly water culture calendar. Multipliers have the responsibility of applying lessons learned and therefore shall replicate the courses or form water protection clubs in their communities or schools. Finally, entities making the work agreement make an evaluation and follow up of the program.

ECP is financed by central government budget and contributions made by its different support entities, among which there are international organizations, private producer associations, municipal and departmental institutions, universities, public and private water companies and regional corporations.

4.4. Labor Competencies Certification Program (Lccp)

As part of the National Training and Technical Assistance Plan designed by MEHTD, the Labor Competencies Certification Program has the objective of promoting training and providing labor competencies certifications to workers involved in public and private companies providing domiciliary public services.

Organisms authorized in the drinking water sector to grant certifications to workers are the National Learning Service (NLS) and the Colombian Institute of Technical Standards (ICONTEC). However, due to restraints in their response to certification demands due to lack of staff, consultants, professionals and some entities have been trained so they can also carry out the certification process. This process results in measuring the qualification, performance and suitability level of personnel working in water utilities. It is therefore clear that LCCP works on strengthening of capacities at individual level and in the development of human talent.

Although such strengthening is done at individual level, LCCP establishes some clear functions for two intermediate level entities, such as departments and municipalities. Departments are in charge of making diagnoses and prioritizing training needs jointly with providers and municipalities, as well as elaborating training plans, financing part of them and making the corresponding assessments. On the other hand, municipalities are in charge of implementing training and technical assistance programs.

During 2004, 304 workers were certified and evaluators' education workshops were carried out in cities like Popayán, Sincelejo, Bogotá, Bucaramanga, Sogamoso and Yopal. According to MEHTD's (2005) data, up to 2004 there was a 50% compliance level in terms of labor certifications, while the other 50% were pending for the years 2005 and 2006.

4.5. Community Small Enterprises Program (Csep)

Although ECP tries to strengthen company management in municipalities with less than 12,500 inhabitants, CSEP has the objective of creating private initiative small community enterprises (such as users' councils and associations) or public companies (organizations of public cooperative management), that are in charge of water, sewerage and hygiene services with a solidarity vision. For this purpose, CSEP included five phases. The first one makes a diagnosis of the present situation of services, having in mind all its components (systemic evaluation of water and sanitation services). Then, the most convenient scheme for service provision in the studied municipality is

analyzed (structuring of community based utility) and later, users are informed about results of the two stages of diagnosis and alternatives analysis (Information and disclosure). CSEP continues with the total process of incorporation and legalization of the community company chosen (incorporation of the community company and training) and it finalizes by training the totality of company officials and the community in their job performance through educational journeys and accompanying the company's start up. MEHTD makes three visits for this after the start up and the accompaniment are done.

During the four years of the present government period (2003-2006), the final goal was to incorporate and consolidate 184 community companies, with intermediate goals of 37 companies in 2003 and 55 in 2004. Intermediate goals have been accomplished and up to 2004, 96 companies had been formed, meaning the program's goal has possibly been achieved (MEHTD, 2005).

4.6. Conditions For The Development Of Capacities In The Drinking Water Sector

The water sector in Colombia still shows a huge amount of problems because the Government has made a list of 25 situations that threaten the sector's good performance. These problems have been classified under six categories, including: Regulatory, inspection, surveillance and control, financing, quality and coverage, entrepreneurial management and environmental sustainability categories. Annex 7 shows a complete list of problems.

As far as regulations are concerned, problems are basically related to uncertainty caused by certain dispositions due to their lack of clarity, their complexity or the impossibility to comply with them by some stakeholders (for example, tariff regulation is hard to understand and even worse, harder to apply, especially in companies located in small municipalities and rural areas). Besides, it also lacks a regulation that is more appropriate and adapted to Colombia's conditions because, for example, it does not have specific dispositions for rural areas. Additional to this is the lack of information that avoids generating a more adequate regulation. Obviously, regulatory weaknesses negatively affect capacity development since they do not allow generating an enabling environment for each stakeholder to play their role in the best way possible.

Inspection, surveillance and control are affected by the presence of several institutions executing this type of activities, but usually in an uncoordinated manner. Also, the Domiciliary Public Services Superintendence, entity legally assigned to watch over management performance of the totality of the sector's utilities, does not seem to have all required technical capacity since their staff and financial resources are insufficient for assuming its role. This affects development of capacities since there is not enough information to make plans, programs and projects in the weakest management areas and designing strategies with the participation of intermediate level stakeholders.

With respect to funding, some aspects have already been mentioned. Among them is the non-adequate allocation of sector resources, being deviated to other expense items. Also, the fact is there are some financially weak municipalities that cannot make investments with their own resources, and do not have easy credit access. The result is an impact on the support they may give to water and sewerage companies. At internal level, many of these companies cannot cover their expenses with their present tariffs so

these can only cover short term operations, maintenance and administration costs and are constrained for including in their long term investments aspects such as organizational development and human talent strengthening.

With regards to quality and coverage, these two problems were previously analyzed.

Management of sector companies is one of the main existing problems. Several of these problems, such as ignoring standards, the lack of planning and low education of operational and technical staff, arise from weaknesses or lack of institutional support at the lowest possible level (intermediate level). In other words, they are clearly related to intermediate level inefficiency in providing this type of support.

Finally, environmental sustainability is a problem because resources are generally scarce in the companies and are basically used to cover the main job of providing water service, ignoring environmental objectives. Even fees that have to be paid for waste water disposal into rivers have become a strong liability for these companies.

5. CONCLUSIONS

Development of capacities in the water sector in Colombia has a great amount of limitations. One of them is related with problems in institutional development, specifically with issues related to regulatory frameworks that although may be very comprehensive, they also frequently change, generating a high degree of uncertainty in suppliers and intermediate level, and does not reflect characteristics of smaller municipalities, which represent 80% of the total in Colombia. Also, at national level there are multiple stakeholders having diverse functions in the sector, but lacking a clear and operative coordination strategy. In the case of policies, although these are coherent and set goals and strategies, they do not have indicators for their follow-up and assessment, nor a clear identification of financial sources for their achievement.

With respect to organizational development, capacity development has been basically done through state initiatives, through programs in which the main vision is entrepreneurial strengthening, especially in private utilities. Programs have generated a significant and useful amount of tools (such as manuals, booklets, videos, application formats in the companies, etc.) but their transference is usually made through workshops that are the main training strategy, being insufficient. However, these programs have not considered capacity development at the intermediate level (municipalities, departments, consultants, universities and others), and rather directly strengthening the providers. That is why the role of intermediate stakeholders is not clear. Maybe for this reason, program impact in terms of amount of formed and strengthened companies is still precarious. However, in case of adopting the strategy to strengthen the intermediate level might it may be possible to encounter the problem of their low capacity to support providers due to their scarce staff, high rotation level of professionals and high bureaucracy of decisions having to do with professional and consultant hiring. Additionally, capacity development do not include a gender approach going from policy levels to methodologies, booklets and manuals.

Present and future proposed policies do not show a high priority being given to capacity development. This is maybe why, in spite of the sector having seen its available resources grow, in part as a result of collecting tariffs from users, these are generally oriented towards increasing coverage and improving technical aspects considering only one component of institutional, organizational and human talent strengthening. At individual formation level, universities offer programs with very theoretical programs, which are not very practical.

6. RECOMMENDATIONS

A sustainable strategy oriented towards capacity development shall begin by the generation of an enabling environment for it, including creation of policies focusing this component (considering resources, goals and indicators for follow up and control), making the regulatory framework simpler considering small municipalities' needs and strengthening national level stakeholders, improving availability and skills of its personnel and coordination existing among institutions.

Additionally, capacity development should consider strengthening intermediate level stakeholders, such as municipalities, departments, consultants and universities in order to make them capable of providing support to service providers. State programs should include the gender issue as one of its fundamental pillars and also use strategies that complement workshops as a way of training. Universities shall form professionals with a broader social vision and the capacity to make practical interventions maintaining their theoretical strength.

Since the strengthening of capacities does not occur spontaneously, it is vital to allocate resources for this type of components in the plans, programs and projects. Also, it is necessary to consider the possibility of strengthening initiatives such as AQUACOL and its Community Resources Centers, which are organizations that remain closer to the community, speak the same language, have experienced the same type of problems and may have a better way of supporting providers and intermediate levels in the strengthening of their capacities.

7. BIBLIOGRAPHY

CGR, Colombia's General Comptroller's Office (2005). Management Balance of the Drinking Water and Sanitation Sector. Bogotá.

DNP, National Planning Department (1995). 1995-1998 Water Plan, Water and Sewerage. Conpes document 2767, Bogotá.

DNP (1999). Drinking Water and Basic Sanitation Sector Plan. Conpes document 3031, Bogotá.

DNP (2003). Policy Alignments for the Water and Sewerage Sectors. Conpes Document 3246, Bogotá.

DNP (2005a). Colombian Goals and Strategies to Reach the Millennium Development Objectives, Bogotá.

DNP (2005b). Colombia's Vision II Centennial: 2019, Proposal for Discussion. Bogotá.

DNP (2005c). Water and Sewerage Sector Development Plan. Conpes Document 3383, Bogotá.

DNP-PNUD-GTZ (2004). Colombian Regions Facing the Millennium Objectives. Bogotá.

GALAN, F. (2005). National Environmental Forum on Water Law Project. Memoirs. Bogotá.

MINMABIENTE (2005). Water Law Project. January 17/2005 Version. Bogotá.

MINAMBIENTE-USAID, 2005. Drinking Water and Basic Sanitation Policy Alignments for Rural Areas in Colombia. Bogotá.

MINDESARROLLO (1997). Entrepreneurial Culture Program. Bogotá.

MINDESARROLLO (2001). Entrepreneurial Management in Small Municipalities and Rural Areas, Booklet No. 1 of the Entrepreneurial Culture Program. Bogotá. ,

PGN-UNICEF (2005). General Prosecutor's Office of Colombia. Childhood, adolescence and a healthy environment in the Departmental and Municipal Development Plans. Bogotá.

TAMAYO, S. and GARCÍA M. (2006). State strategy for the strengthening of public service providers in small municipalities and rural areas. The Entrepreneurial Culture Program in Colombia. In: Support to Drinking Water Committees Management: Experiences of Strengthening of Drinking Water Committees with Community Management in Bolivia and Colombia. Comp. Quiroz, F., Faysse, N. and Ampuero, R. Cochabamba, Bolivia.

URIBE, E. and DOMÍNGUEZ, C. (2005). Evolution of Domiciliary Hygiene Service during the Last Decade. CEDE Document, 2005-20, Universidad de los Andes, Bogotá.

ANNEX 1

SITUATION OF THE WATER QUALITY PROVIDED BY DEPARTMENTS IN COLOMBIA (FIRST SEMESTER 2005)

Departments	Municipalities within each Department	Municipalities reporting	Municipalities complying	Biological complying	Physical and chemical complying	Close to comply	Bad water quality
Amazonas	6	5	0	0	0	0	5
Antioquia	125	125	53	53		26	21
Arauca	7	7	0	1	2	1	1
Atlántico	23	22	6	7		4	1
Bolívar	45	44	0	0		1	14
Boyacá	122	85	6	9	47	4	20
Caldas	27	27	17	24	17	7	2
Caquetá	16	15	0	1	0	0	10
Casanare	19	18	0	3	0	4	12
Cauca	41	36	0	1	1	3	5
Cesar	25	21	1	7	1	2	7
Córdoba	28	28	1	2	4	2	18
Cundinamarca	116	115	13	57	16	11	23
Chocó	31	8	0	0	0	0	2
Guainía	6						
Guaviare	4	4	0	0	1	0	4
Huila	37	37	32	32	32	0	5
La Guajira	15	15		3		0	8
Magdalena	30	27	0	0	0	0	25
Meta	29	24	0	1	1	2	17
Nariño	64	61	1	4	3	6	6
Norte de Santander	40	39	1	4	3	6	6
Putumayo	14						
Quindío	13	12	11	11	11	0	1
Risaralda	14	12	0	2	3	0	0
San Andrés y Providencia	2	1	0	0	0	0	0
Santander	87	66	5	10	13	1	22
Sucre	26	22	1	3	1	0	7
Tolima	47	47	4	4	14	3	20
Valle del Cauca	42	30	19	20	24	7	0
Vaupés	6	6	0	0	0	0	6
Vichada	6						
Total	1113	959	171	259	196	84	295

Source: Diagnosis of the Water Quality for Human Consumption in Colombia, in the Framework of the Human Right to Water. REPORT 9-B.

ANNEX 2

LEVEL OF INCLUSION OF WATER AND BASIC SANITATION TOPICS IN DEPARTMENTAL DEVELOPMENT PLANS

TOPIC	SUB TOPIC	DEPARTMENTAL DEVELOPMENT PLANS (N = 32)							
		Diagnosis				Strategic Component			
		Do not include the topic		Include the topic Level of inclusion		Do not formulate programs / projects		Formulate programs / project / level of inclusion	
		%	N°	%	N°	%	N°	%	N°
Drinking	Drinking water coverage	16	5	84	27	0	0	100	32
Water	Drinking water quality	31	10	69	22	6	2	94	30
and	Sewage sytem coverage	19	6	81	26	0	0	100	32
Basic	Wastewater tretament plant	31	10	69	22	9	3	91	29
Sanitation	Solid Waste tretament plant	19	6	81	26	0	0	100	32
	Other	72	23	28	9	41	13	59	19

Source: Database with results of the analysis from 964 municipal and 32 departmental development plans, prepared by Procuraduría General de la Nación and UNICEF, 2005

LEVEL OF INCLUSION OF WATER AND BASIC SANITATION TOPICS IN MUNICIPAL DEVELOPMENT PLANS

TOPIC	SUB TOPIC	MUNICIPAL DEVELOPMENT PLANS (N = 964)							
		Diagnosis				Strategic Component			
		Do not include the topic		Include the topic Level of inclusion		Do not formulate programs / projects		Formulate programs / project / level of inclusion	
		%	N°	%	N°	%	N°	%	N°
Drinking	Drinking water coverage	11	104	89	860	2	22	98	942
Water	Drinking water quality	15	144	85	820	6	60	94	904
and	Sewage sytem coverage	12	114	88	850	4	43	96	921
Basic	Wastewater tretament plant	19	187	81	777	11	108	89	856
Sanitation	Solid Waste tretament plant	12	120	88	844	3	31	97	933
	Other	35	335	65	629	24	227	76	737

Source: Database with results of the analysis from 964 municipal and 32 departmental development plans, prepared by Procuraduría General de la Nación and UNICEF, 2005

ANNEX 3

STRATEGIES TO COMPLY WITH MILLENIUM DRINKING WATER AND SANITATION DEVELOPMENT GOALS SOCIAL CONPES DOCUMENT 91, MARCH, 2005

The integral strategy suggested to improve sector conditions and reach coverage goals has three components:

1. Financial Component

1. 1 Eliminate tariff delays in municipalities where such tariffs are not sufficient to at least cover efficient management, operation and maintenance costs.
- 1.2 Application of new tariff methodologies and their surveillance by the Domiciliary Public Services Superintendence will have a positive impact in the sector, as suppliers identify and use efficiency signals.
- 1.3 Create mechanisms to incentive municipalities in the efficient use of Participation General System resources.
1. 4 Improve subsidy approach, generating more investment resources and providing for the first time a subsidized service to users.
1. 5 Promote mechanisms facilitating the involvement of new investors through capital market in order to have long term financing, in accordance with sector's characteristics.

2. Institutional Component

2. 1 Strengthen programs by the Ministry of Environment, Household and Territorial Development (MAVDT), making more efficient programs. This capacity building shall be accompanied by the corresponding institutional adjustments in order to have a more efficient allocation and usage of transference resources to municipalities.
2. 2 Support capacity building of the Domiciliary Public Services Superintendence (SSPD) and Regulating Commission of Drinking Water and Basic Sanitation (CRA), in actions aimed towards the elimination of inefficient public utilities and suppliers
2. 3 Establish mechanisms for efficient collection, processing and usage of sector information. General nationally accrued information or information from large regions can be obtained in surveys made by the National Department of Statistics (DANE); however, to make a specific follow up that allows detection of municipalities in more critical situations and knowing in the direction in which efforts shall be focused, there is the Unique Information System (UIS) managed by SSPD, which is presently being developed.

3. Sector Entrepreneurial Structure Component

3. 1 Guide private participation processes in associations of municipalities or individual municipalities through the Entrepreneurial Modernization Program and promotion of private participation by the Ministry of Environment, Household and Territorial Development, and the departments. The objective is consolidating the scheme adopted in Colombia for service provision and ensure its efficiency and financial sustainability at medium and long term periods, trying to establish regional schemes that include scale economies and reducing transaction costs in regulation and control processes.

3. 2 Development of community companies, representing communities organized at local level, allowing community participation in service management, development of small enterprises and local productive employment generation. As an additional element, outline the implementation of social capitalization funds incorporating recovery, stabilization and capitalization.

3. 3 Strengthen strategic designs and orientation to adequate proportions of part of transferences sent to rural zones having greater coverage deficiencies.

3. 4 Establish adequate technical assistance for rural areas in terms of supplies, works and training. It is important to carry out educational campaigns focused on status of water quality, hygiene customs and human consumption water manipulation.

3. 5 Promote schemes for service provision through associative ways in locations with less than 5,000 inhabitants and micro-companies or community companies in locations having between 5,000 and 20,000 inhabitants. These rural measures shall be accompanied by networks of support, cooperation and complementation to be generated among them. Central entities must improve information systems for rural areas, promoting citizen participation and implementing technology management applicable to the rural context.

3.6 Protecting water resource conditions that due to lack of financial resources shall start by establishing basin priorities responding mainly to public health reasons, and this way, starting actions with the objective of decreasing deforestation, controlling pollution and implementing waste treatment systems.

COLOMBIA VISION 2019-II CENTENNIAL Drinking Water and Sewerage Sector Goals

Goal	Present Situation	2010 Situation	2019 Situation
Design and execution of management and regulatory plans in moors and water ecosystems that supply locations with more than 50,000 inhabitants.	5% of basins have management and regulatory plans in implementation.	Basins supplying 50% of these locations have implementation plans.	Basins supplying 100% of these locations have implementation plans.
Increase urban water coverage	97,4 %	98,5 %	100 %
Increase urban sewerage coverage	90,2 %	94,5 %	100 %
Increase rural water coverage	68,6 %	75,1 %	82,2 %
Increase rural sewerage coverage	57,9 %	65,59 %	75,2 %

Source: Colombia Vision II Centennial. Discussion proposal, Executive Summary.
Presidency of Colombia, National Planning Department, (DNP), page. 47

ANNEX 4

FINANCIAL RESOURCES FOR WATER SUPPLY AND BASIC SANITATION 2003 – 2006 (MILLIONS COLOMBIAN CURRENCY)

Financial Source - years	2003	2004	2005	2006	Total for period	%
Law 715/ 2001	669.878	683.276	696.941	714.365	2.764.460	72.49
Nation (Public Auctions)		94.984	84.863	186.991	366.838	9.62
Investment Fund for Peace - IFP		8.070	2.690		10.760	0.28
RAC*					122.987	3.22
Departments**					527.090	13.82
Regalías	2.598	4.600	9.243	5.081	21.522	0.56
TOTAL	672.476	790.930	793.737	906.437	3.813.657	100

* Action Plans for Three years time 2004 – 2006 – PAT – for 32 Regional Autonomus Corporations

** Information from 20 Departmental Development Plans

Source: Integrated Water Resources Management. Resources, Projects and Agreements Management.
Directorade for Drinking Water and Basic Sanitation MEHTD. Bogotá, 2004. Pag. 31.

ANNEX 5

National Level

*** Ministry of Environment, Household and Territorial Development (MAVDT)**

The Direction of Drinking Water and Environmental Sanitation forms part of MAVDT and is in charge of creating and executing environmental and sector policies, plans and programs, as well as promoting water resources conservation, providers' efficient management and technical regulations for the sector.

*** National Planning Department (DNP)**

Participates in designing and creating sector policies and follows up and evaluates social investment policies, programs and projects. It also gives technical assistance to territorial entities and supports activities by Drinking Water and Basic Sanitation Regulatory Commission (CRA) and Domiciliary Public Services Superintendence (SSPD) in terms of regulations, supervision and control.

*** Ministry of Social Protection**

Establishes, watches and controls supplied water quality parameters for human consumption and departmental health secretariats are in charge of control activities.

*** Territorial Development Financing (FINDETER)**

Its social objective is to promote regional and urban promotion through financing and advise on design, execution and management of investment projects or programs related to a broad spectrum of activities. One of them is the construction, expansion and reposition of infrastructure corresponding to the drinking water and basic sanitation sector.

*** Hydrology, Meteorology and Environmental Studies Institute (IDEAM)**

This institute is in charge of educating, producing and providing environmental data and information, as well as elaborating studies, investigations, inventories and follow up and management activities of information useful to support decision making in terms of environmental policies.

*** Drinking Water and Basic Sanitation Regulatory Commission (CRA)**

Is the national entity in charge of economic regulations in drinking water and basic sanitation services, in terms of tariff methodology design, determination of quality parameters in service provision, development of methodologies to assess suppliers' management and efficiency, regulation of monopolies and markets.

*** Domiciliary Public Services Superintendence (SSPD)**

Is the national entity in charge of service providers' control and surveillance. Among other, this includes surveillance of adequate application and compliance with regulation standards issued by CRA. It manages the Unique Information System of services and shall take possession of management or liquidation of companies due to reasons established by law. Likewise, it is in charge of watching subsidy management in the Nation, the departments and municipalities.

Regional Level

***Regional Autonomous Corporations (CAR)**

These corporations are in charge of executing policies, plans, programs and projects on environmental and renewable natural resources. Also, they define decontamination objectives and the use of water sources for basins under their jurisdiction, granting water usage concessions and in accordance with the law and MAVDT's regulations, also manage retributory and compensatory fees for water usage.

Local Level

***Departments**

They provide financial, technical and management support to municipalities in the development of competency functions in terms of public services and supporting the formation of associations of municipalities to provide services when recommended by technical and economical reasons, under regional schemes.

Municipalities

Guarantee water and sanitation service supply through companies of private, mixed, and community type, or directly. Form solidarity and redistribution funds to subsidize users in Strata 1, 2 and 3, in applicable cases.

***Public Service Companies**

According to Rural Sanitary Inventory, by 1991, rural areas counted with approximately 11,552 organizations in water and basic sanitation service provision, out of which, 90.5% of the entities were of community type, such as management councils, users' associations and in a lesser extent, cooperative type entities.

ANNEX 6

UNIVERSITIES WITH ACADEMIC PROGRAMS RELATED TO WATER SUPPLY AND BASIC SANITATION

Levels:

Technical: tec

Undergraduate: und

Postgraduate: pos

Diplomad: di

University	Academia Program
Universidad de Santander	Environmental Engineering (und)
Corporación Universitaria de la Costa	Environmental Engineering (und)
Escuela Colombiana de Carreras Industriales	Environmental Engineering (und) Environmental Development (tec)
Universidad Manuela Beltrán	Environmental Engineering (und)
Universidad de Boyacá	Sanitary Engineering (und)
Instituto Universitario de La Paz	Sanitary and Environmental Engineering (und)
Politécnico Gran Colombiano	Environmental Management (tec)
Universidad Antonio Nariño	Environmental Engineering (und) Environmental Development Engineering (und)
Universidad Autónoma de Colombia	Environmental Engineering (und)
Universidad Autónoma de Occidente	Environmental and Natural Resources Administration (und)
Universidad Católica de Manizales	Sanitary and Environmental Development Engineering (und)
Universidad del Norte	Environmental Administration (und) Specialization in Environmental Sanitary Engineering (pos)
Universidad Católica de Oriente	Environmental Engineering (und)
Universidad Central	Environmental Engineering (und)
Universidad Central del Valle de Cauca	Environmental Engineering (und)
Universidad Distrital Francisco José de Caldas	Environmental Engineering (und)
Universidad El Bosque	Environmental Engineering (und)
Universidad ICESI	Environmental Management (pos)
Universidad INCCA de Colombia	Specialization in Management and Community Development (pos)
Universidad Mariana	Environmental Engineering (und)
Universidad Militar Nueva Granada	Specialization in Environmental Planning and Integrated Management of Natural Resources (pos)
Universidad Nacional de Colombia	Master in Environmental Engineering (pos) Master in Hydraulic Resources (pos) Specialization in Hydraulic Resources (pos) Specialization in Hydraulic Resources (pos) (groundwater focus)

Universidad Piloto de Colombia	Administration and Environmental Management (und)
Universidad Pontificia Bolivariana	Specialization in Environmental Management (pos) Specialization in Environmental Engineering (pos)
Universidad Popular del Cesar	Sanitary and Environmental Engineering (und)
Universidad Santiago de Cali	Specialization in Environmental Management and Sustainable Enterprenurial Development (pos)
Universidad Santo Tomás	Environmental Enginnering (und)
Universidad Sergio Arboleda	Specialization in Management for Natural Resources, Environment and Prevention Administration (pos)
Universidad Tecnológica de Per	Environmental Administration (und)
Universidad Tecnológica del Ch	Environmental Engineering (und) Solid Wastes Management Plans (di)
Universidad de América	Specialization in Environmental Management (pos)
Universidad de Antioquia	Sanitary Engineering (und) Specialization in Water Quality (pos) Specialization in Environmental Management (pos) Specialization in Environment and Geo Informatics
Universidad de Bogotá Jorge Ta	Master in Environmental Sciences (pos)
Universidad de Cartagena	Specialization in Sanitary and Environmental Enginnering (pos)
Universidad de Córdoba	Master in Environmental Sciences (pos)
Universidad de La Salle	Sanitary and Environmental Engineering (und) Specialization in Planning and Management and Control of Social Development (pos)
Universidad de Los Andes	Environmental Enginnering (und) Specialization in Evaluation and Prevention of Risks (pos) Specialization in Integrated Environmental Management (pos) Master in Environmental and Natural Resources Economics (pos)
Universidad de Los Llanos	Specialization in Sustainable Environmental Management (pos)
Universidad de Medellín	Environmental Enginnering (und)
Universidad de Pamplona	Environmental Engineering (und)
Universidad del Atlántico	Specialization in Gender, Planning and Development (esp)
Universidad del Quindío	Community and Social Development (und)
Universidad del Valle	Sanitary and Environmental Engineering (und) Technology in Soil and Water Management and Conservation (tec) Specialization in Sanitary and Environmental Enginnering (pos) Master in Sanitary and Environmental Enginnering (pos)

Source: Authors

ANNEX 7

MAIN PROBLEMS OF THE WATER AND SANITATION SECTOR

Regulations

- 1 Regulatory uncertainties in the sector.
- 2 Lack of regulatory development according to requirements (no advance made in efficiency costs).
- 3 Lack of adequate information for regulatory effects.

Inspection, surveillance and control

- Multiple entities executing inspection and surveillance activities that hamper control activities in companies.
- 5 Excessive operation load in the Domiciliary Public Services Superintendence (SSPD), which affects its impact in Public Services Companies (ESP).

Financing

- 6 In most cases, tariffs do not cover the entire costs (tariff delays – unbalanced market).
- 7 The Nation has limited resources.
- 8 Improper application of resources transferred from the nation to the municipalities.
- 9 Critical financial situation of the municipalities
- 10 ESPs access to credit resources is limited
- 11 Resources allocated to investments are considered profits and therefore, are taxed.

Quality and Coverage

- 12 Aqueduct coverage deficits among regions, strata and areas (rural and urban).
- 13 Drinking water low municipal coverage.
- 14 Problems in water service provision quality.
- 15 Sewerage coverage delayed compared to water coverage.
- 16 Deficiencies in waste water management in the country.

Entrepreneurial Management

- 17 Labor and financial liabilities are critical in company balances and therefore, their effect shall be determined.
- 18 Low levels of billing collection.
- 19 High indexes of water not accounted for.
- 20 Low education level of operational and technical personnel.
- 21 Unknown standards and regulations.
- 22 High turnover of limited decision-making management personnel
- 23 Actions aimed to problem solving without any previous planning.

Environmental sustainability

- 24 Lack of resources to simultaneously comply with service and environmental objectives.
- 25 Company environmental liability (Retributory fee).