Integrated Water Resources Management and the Millennium Development Goals in Chad

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Abstract: Chad, a country located between the 7th and 24th degrees north latitude and the 13th and 24th degrees east longitude, presents as many developing countries multiple problems related to managing its water resources. In fact, several political, social, economic and environmental factors hinder their effective management. These factors deal particularly with the passivity of the actors in charge of water problems, an overlap of competences, the lack of financial means, the sectorial approach of solving problems related to water, the unilateral policy, the inefficiency of the main drinking water distributor (STEE), the sociopolitical context characterized by a pseudo instability, the lack of human capacities and the lack of appropriate texts and adequate structures. The consequences are dramatic and affect significantly the development process. Thus, the constant degradation of water quality and its unequal distribution are all tangible signs which indicate a poor water management, and contribute significantly to the population's impoverishment in terms of health, urbanization, economy and trade. Some bilateral and multilateral actor's initiatives which are centered on water supply, the irrigation program support, fishing, etc., come light this on the dark board of water management in Chad. The ratification by Chad of various international treaties related to water and its membership at the different organizations in charge of basins management (Niger Basin Authority, Lake Chad Basin Commission) constitute the advantages for national improvement framework of the integrated water resources management. The integrated water resources management (IWRM) is a systematic process for sustainable development, attribution and monitoring of the use of water resources in the context of the social objectives, economic and environmental. It is a very important and strategic framework for a double targeted process for achieving the Millennium Development Goals (MDGs) and the strategy of sustainable development as recommended during the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002. The Governments need to plan the implementation this strategy to achieve the Millennium Development Goals (MDGs).

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1. Introduction

Water is a natural resource around which increasingly high stakes grow worldwide. Its unequal distribution in time and space induced the bound crises, either with its lack, or it's excess. Indeed, as underlines Toepfler Klaus, managing director of the United Nations Environment Program (UNEP), "water is closely linked to health, agriculture, energy and biodiversity. Without progress on water, it will be difficult or impossible to achieve the other Millennium Development Goals ". Given the combined pressures of rapid increase demand and the continuous deterioration of water quality, management models of the past are no more sufficient for the task, we must from now on leave the technological mirage to rethink of the approaches that will make it possible to satisfy human needs while maintaining the quality of natural systems that support the existence of the human community [Burton., 2001].

Many developed countries have understood and have initiated concrete actions to efficiently manage their water resources [UN-WATER/WWAP., 2006]. Those multiplied their actions and reinforced their political and economic commitments towards the implementation of measurements, plans and laws existing in the field of water. They include among others the implementation of the Framework Directive on Water (DCW), the creation of the structures such as the International Office of Water (IOW), the Group of

European Basin Organizations (EURO-RIOB), etc., for the European countries. Furthermore, some developing countries among which South Africa, have also initiated reforms and developed actions to achieve national and international integrated management of water resources. Unfortunately, this does not seem to be the case for most other developing countries in general, and Chad in particular, where the management of water resources is still at the stage of infancy [TEC., 2005]. The disparities observed both at the distribution and the quality of water resources are revealing of the challenges posed by Chad in its management of water resources. The management of water resources in Chad is suffering from bad governance, fragmentation of its institutions, the absence of a political will resolutely turned towards the improvement of the water resources etc. These resources are today suffering from increasing degradation and exploitation faced with an increasingly high request. This situation more or less catastrophic has adverse effect on the health, socio-economic and environmental. The poor people are most affected by this state of affairs. However, it is widely recognized that a better management of water resources constitutes a pledge for improvement living conditions of populations and the fight against poverty.

Thus, to provide drinking water to the people, to maintain the quality of water resources, to create a dynamic interactive water management and to distribute rationally water resources seem to be today the challenges for developing countries. It is therefore urgent to establish a logical framework for management that contributes to achieving these objectives. To be effective, the logical framework should be based on a good knowledge of water resources while taking into account of the local context. For this purpose, in the framework of this study, we will dwell on the definition of the institutional, legislative and regulatory management of water resources in Chad, the description of the different water resources and identification constraints and opportunities related to the implementation of Integrated Water Resources Management (IWRM) in Chad. It is first necessary to define what the IWRM is and its contribution in achieving the Millennium Development Goals (MDGs).

This study, developed in a dynamics prospective aims is to make at one hand a report on the place of the management of the water resources in Chad and on the other hand, to develop in the light of the IWRM an action plan for an effective use and the conservation of these resources.

2. Methodology

This study was conducted on the basis of data resulting from literature searches, field observations and semi-structured interviews conducted with institutional and non-institutional actors.

2.1 Concepts of the Integrated Water Resources Management (IWRM)

In the framework of the Millennium Declaration (New York, 2000) on the MDGs, water is taken into account by Objective n°7 heading: "to ensure environmental sustainability". This objective is structured into three targets, of which one envisage to reduce half from here to 2015 the proportion of people which does not have access in a durable drinking water [GWP / INBO., 2009]. Moreover, the Declaration of the World Summit on the Sustainable Development (WSSD) held in Johannesburg in 2002 recommended to the developing countries to stop the uncoordinated exploitation of water resources by developing strategies and national action plans of integrated water resources management that promote equitable access to these resources for all types of use. For this purpose, the integrated water resources management is a process that supports the development and coordinated management of water, land and related resources, in order to maximize, in equitable manner, the economic welfare and social resulting, without compromising the sustainability of vital ecosystems [GWP / INBO., 2009]. However, integrated water resources management is not just about managing natural resources. It also means reforming human systems to enable people to reap the benefits of this resource [TEC, 2005].

IWRM seeks to avoid losing lives, wasting money and deplete the natural environment due to inappropriate decisions. It is iterative and dynamic insofar as it adapts to the new economic, social, environmental and human change. Basically, as a process of change, IWRM aims to ensure that water is used to make progress in the objectives of economic and social development of a country by means which do not compromise the sustainability of vital ecosystems or the possibility for future generations to meet their water needs. The implementation of IWRM does not mean to destroy everything and start again. Generally, it consists of an adaptation, enlightenment on existing institutions and planning procedures to achieve a more integrated approach [GWP/INBO., 2009]. In this subject, developing countries general and Chad in particular who have the basic structures have to scrutinize and implement IWRM for better management their water resources.

Table 1: The areas of change of IWRM [TEC., 2005]

Action Points	Target areas	Actions to be
Favorable Environment	Political Framework	To set targets for the use, protection and conservation of water
	Legislative Framework	To vote laws to follow to achieve the goals
	Financing structures	To allocate financial resources to satisfy the water needs
Institutional Roles	Organizational framework	To create a body to coordinate the formal and functional aspects
	Institutional Capacity enlightenment	Developing Human Resources
Management Instruments	Assessment of water resources	Understanding the availability and needs
	Development plans for IWRM.	To combine development options, resource use and human interaction
	Demand Management	Using water more efficiently
	Instruments of social change.	To support a civil society-oriented towards water
	Conflicts Resolution	Manage disputes by ensuring the sharing of water
	Regulatory instruments	Limit distribution and use of water
	Economic instruments	To use the value and prices for efficiency and fairness
	Exchange and information management	To improve knowledge for better water management

2.2 Natural structure

Chad is located between the 7th and 24th latitude north and 13th and 24th longitude east. It covers an area of 1 284 000 km^2 and occupies the 5th place of the largest countries in Africa. From North to South, Chad spread over 1 700 km and from east to west over 1000 km. It is bounded to north by Libya, east by Sudan, south by the Republic of Central African and west by Cameroon, Nigeria and Niger [Hcne., 2005].

Two physical units divide the country and make that we distinguish a flat unit, the Chadian basin and the bumped terrain, the sprouting rocky. That's why Chad is qualified as shaped of a basin with raised on the edges. Chad flat consists of two plains separated by the Chadian central massive (Mount Guera): (i) the desert plains of northern reaches its lowest level in Chicha (Djourab) wells. The harshness of the desert area explains the low population density which develops only around the oases. It is the case of the vast palm plantation of Faya Largeau. The lack of the rains imposes breeding of animals as main activity and to those who practice a kind of nomadic life, (ii) the second plain drained by the Chari /Logone unit. It is a floodplain with a mixed breeders and farmers. Ecological conditions are favorable. The population density becomes more significant especially in the basin of the Logone middle. The disadvantage is that atmospheric and river waters transform this plain into a veritable swamp, making traffic impossible during part of the year [Hcne., 2005].

The checkered Chad: the described plains are surrounded by a whole rock make up in north by the Tibesti Mountains (highest peak is Emi Koussi with 3414m); in the north-east by Ennedi shelf, the massive Ouaddaï in the east. The Guéra Mounts in the center and the Mounts de Lam in south to which the last systems collinear are added in South-west, the foothills of Adamawa (Cameroon), form the half-crown mountain. The climate of Chad is a tropical climate characterized by two seasons: a rainy season and dry season of which the duration varies with latitude. Marked by the seasonal fluctuation of Inter Tropical Front (ITF), Chadian climate is a determining factor for disastrous consequences (drought and desertification) or propitious to the natural environment and its evolution. There are three climatic zones marked by a fast decrease rainfall from south to north. From south to north can be distinguished: (i) The Sudanese climate is characterized by an abundant rainfall exceeding 800 mm of rain a

year and a rainy season equal to the dry season (6 months). Right climate to agriculture activities, (ii) Located between the 11th and 15th parallel, spread out Sahelian climate whose isohyets are between 600 and 250 mm. It is marked by a dry season longer than the rainy season. The size of rainfall decreases gradually as one goes northward and the pastoral is the main activity, (iii) Finally, the Saharan climate which isohyets are between 250 and 0 mm per year, is characterized by a quasi-permanent aridity making possible the agricultural and pastoral activities around oases. The rains are scarce and every type of climate corresponds to each type of vegetation [Hcne., 2005].

Generally, the vegetation is marked from south to North by the sudano-Guinean forest which yields quickly to the sparse forest and wooded savanna of the sudanian domain, then with the shrubby savanna of the sahelo-sudanian, and, more in north with the steppe or pseudo steppe whose northern borders are formed by the soils characterized by dunes and ergs of the Saharan desert. The climate is an important factor and determining for the human activities, it influences the establishment of the population and even the lifestyles.

2.3 Inventory of water resources in Chad

Water resources in Chad are many and varied. Their distribution is unequal and is often influenced by climate. Overall, it distinguishes surface water and groundwater.

On the hydrographic level, the surface water made up of rivers and lakes are not very important in the north of the 14th parallel, but relatively abundant below this latitude. The main permanent rivers are Chari and Logone. The first, 1200 km long, takes it source in Republic of Central Africa. From North-east of Adamawa in Cameroon, the Logone, about 1000 km long, joins the Chari in N'Djamena, where they form the Logone-Chari system with surface of their catchment area is 600 000 km^2. These two rivers add to the semi-permanent and temporary rivers. Regarding the lakes, the most important is the Lake Chad, the residual fraction of a vast inland sea which, the Paleolithic would have covered about 230.000 km^2. With the persistent drought suffered by Chad, the water level of this lake was known from the 70s, a significant decrease. Its area decreased from 25 000 km^2 in 1963 to less than 2,000 km^2 at the present time. It is fed mainly by water from the Chari-Logone system, which represents about 82% of inputs, the direct rainfall 14% and the remaining by the rivers El Beid Komadugu-Yobe (Nigeria-Niger). [Schneider., 2001]. In addition to Lake Chad, there are other modest lakes or rivers: (i) Lake Fitri located at 260 km north-east of N'Djamena, which is fed by Batha. Its area is variable depending on rainfall and can reach an area of 800 km^2; (ii) Lake Iro, located at the south-west of Salamat prefecture. Lake Iro is fed by waters of Barh Salamat which is one of the tributary of the Chari River; (iii) Lake Lere, located at the south-west of the country, is the longest lake. It is fed by the Mayo Kebbi, tributary of Benoy. Its area can reach 50 km^2 [Schneider., 2001]. In the north of the country, there are certain numbers of small lakes whose areas range from 1 to 8 km^2. These include: Ounianga Kebir; Ounianga Seghir, Ouaddi Doum. Overall, the surface water resources are abundant in Chad and in particular the system Chari / Logone.

From hydrogeological point, Chad can be divided into four great units distinct: the Continental Terminal, the sandstones primaries, the Nubian Sandstone and the Plio-Quaternary system of the Chadian basin (Pliocene Sands Ogoliens, Pleistocene, Modji Series) [Hcne., 2005]. (i) The Continental Terminal formations outcropping on the north and south edges of the Chad Basin. They contain powerful sandy layers with an area of 130 000 km^2 in the north and 160 000 km^2 in the South. The exploitable reserves are estimated between 72.5 and 145 billion m^3. The resources are renewable at south regions: the average blade of water infiltrated is estimated at 83 mm (830 m^3/ha) and the renewable volume each year is estimated at 13.300 billion m^3. (ii) The sandstone primaries occupy an area about 115 000 km^2 in Borkou-Ennedi, in the north of the country, reaching 800m thickness. The rocks, often cracked, have high permeability. Sinkings in Faya gave artesian flow of 150m^3/h. the reserves are very important: 60 to 120 billion m^3. These waters are over 5 000 years, corresponding to the climatic optimum of the Holocene average. (iii) The Nubian Sandstone (Cretaceous) who outcropping at the north-east in the Erdis, stretch to Sudan and Libya and form a common tablecloth to these three countries. They are little known in Chad, where they occupy an area of about 73.000 km^2. The exploitable reserves would range between 36 and 75 billion m^3. (iv) The Chadian basin consists of Quaternary sand formations, the lower Pliocene and the Continental terminal. The Quaternary sands contain generalized unconfined aquifer whose power can

exceed 150m. The piezometric surface is at a few meters. The high permeability of ogoliens sands provides highly productive wells. The substratum of this aquifer is formed by clays of the upper Pliocene. Tablecloths of Pliocene and Continental Terminal are deep. The lower Pliocene aquifer is between 270 and 330m depth in the north of N'Djamena. They are artesian in edge of Lake Chad and in the north of N'Djamena with high flow rates (average of $30m^3/h$). The area of the Plio-Quaternary aquifer is about 360.000 km^2 [Hcne., 2005]. Its exploitable reserves have been estimated from 94.6 to 206 billion m^3 and the renewable volume each year is estimated at 3.6 billion m^3 [BRGM., 1987]. Chad has overall a large groundwater reserve which varies between 260 and 550 billion m^3.

Water resources in Chad, despite an unequal distribution, exist and are relatively abundant. The establishment of a coherent institutional, legislative and lawful structure is essential for effective management of these resources.

2.4 Institutional, legislative, lawful structure related to management of water resources

The urgent need for effective and sustainable management of water resources has prompted the Chadian government to establish structures and laws governing the water sector throughout the territory.

2.4.1 Institutional structure

Several state and no state structures work in the water sector in Chad. The roles of different actors are defined by specific texts. All these institutions are classified according to their modes of intervention in organizations of execution, orientation and control, technical support and council, organizations of management and exploitation of the service of water, organizations of financing **(table 2).**

Despite the difference in their action, all these organizations seek environmental protection, public health protection, waste collection and treatment, drainage of wetlands, in short management of water resources. These different structures operate independently without consultation. The non-institutional actors are rarely included in the water resources management project.

2.4.2 Legislative and regulative structure for water management in Chad

The law N° 016/PR/99 of August 18, 1999 entitled "Water Code" is the main document, if not the only one that defines a regulative structure of water sector in Chad. Furthermore, the decrees on enforcement of Water Code making it possible to govern the regulative structure are not yet all updated, and the delays taken in drafting of the regulation decrees do not make the regulative structure completely operational [Hcne., 2005]. Article one of this Code specifies that "The management of river, lake or groundwater, and the exploitation of hydraulic structures are determined by the provisions of this Code, subject to the respect of the international agreements. All the water resources, located within the national territory, are the collective good. For this reason, they are part of the public domain of the State which is inalienable and indefeasible. Their operations are subject to the declaration or authorization within the framework of the laws and regulations in force, and in accordance to customary law". The Water Code treats several aspects related to public service water in urban area, whereas the aspects of the pastoral and rural hydraulics (wells, boreholes, hand pumps, etc...) are less developed.

The development and publication of a main document called " Water Planning and Sanitation Program 2003-2020" in June 2003; this document presents a policy, a strategy and action plan with an organizational structure for water governance and the reinforcement of national capacities (Central, Regional and Local). Other principal regulations texts governing the sector are listed below:

Decree N° 249/PR/MEE/02 defining the procedures and conditions of transfert on a provisional basis by the state to the Decentralized Territorial Collectivities, of its powers as regards delegation of the Public Drinking Water service;

Decree N° 029/MEE/DG/02 defining the framework model of the particular contract of Delegation of the Public Drinking Water service at an Association of Water User or private farmers;

Decree N° 028/MEE/DG/02 defining the model framework of the particular convention of the power transfer of delegation from the State Water Public Service to a Decentralized Territorial collectivity. The provisions of the decree indicate that this transfer must be carried out in a mode of exploitation and

management of participative type involving user's beneficiaries;

Decree N° 030/MEE/DG/02 bearing terms of constitution, organization and functioning of drinking water users associations. The decree defines the procedures to constitute, organize and operate a group of user of the same supply system - drinking water distribution. It defines the framework model, mandatory notes for setting Statutes organizations of drinking water users.

On the International plan, Chad has ratified several multilateral conventions on the environment of which some problems related to water and sanitation. Regionally, Chad belongs to the Niger Basin Authority (NBA), the Lake Chad Basin Commission (LCBC) etc. [Hcne., 2005].

2.4.3 Socio-Economic structure

The socio-economic context related to water management in Chad has been marked several years ago by the implementation of vast structural adjustment programs carried out under the assistance of Breton Wood Institutions (World Bank). These adjustments have resulted in the good governance, the decentralization of public services. These reforms coupled with the Chad admission on the Initiative of Highly Indebted and Poor Countries have improved the macroeconomic performance of the country but the situation of people did not really changed. The poverty remains endemic. The priority for the government and the development agencies today is to implement actions contained in the Strategic document of fight against poverty. Water is one of its sectors. However, we note on the population level, a concern to manage the daily train than to deal with the protection of water resources. Despite the institutional, legislative and regulatory framework well equipped, the water management in Chad is still stammering and the consequences on the ground are disastrous.

2.5 Constraints related to the management of water resources in Chad

The effective and efficient management of water resources constitutes a major challenge for Chad at the dawn of this third millennium. However, many internal and external factors hindering the proper management of these water resources. A diagnosis makes it possible to record the following constraints:

The management of water resources is done on a sectoral way. Indeed, despite the primacy of the management of water resources recognized in the Water Ministry, several other ministries (agriculture, livestock, health, etc.) are interested at varied degrees. Very few actions of these various departments are done in a concerted way and often there is an overlap attends of competence and the achievements on the field.

Noninvolvement of the populations to the projects related to water in their regions. All decisions are made at central government level and are applied in the field without considering the aspirations of the population. These populations are the first to suffer for the nuisance after the implementation or carrying out a project related to water in their areas (for example the malaria and diseases hydrous origin). Similarly, the private sector generally very active in the field is put on the margin in the management of water resources framework. The research is inoperative. To this day, Chad does not have unfortunately reliable data and constituted of water resources throughout the territory. The data are scattered and are usually acquired during the implementation of great projects. The lack of monitoring of hydraulic works made during these projects is one of constraints related to management of water resources in Chad. Indeed, the most part of these pieces become not operational at the end of these projects. Similarly, there are no national standards relating to water quality in Chad. Reference is despite of the variation that comprises to the standards of the World Health Organization (WHO) and to the European Union standards (EU).

The ineffectiveness of the Chadian Water and Electricity Company, main dealer of drinking water supply in Chad. In Chad, the proportion of people having permanent drinking water in rural areas, in 2007 is 34.5%; the population applying measures of hygiene is about 18%. In cities equipped with a network of drinking water supply system, only 9.7% of the populations have a connection, while 27.5% are supplied with the public fountain, and 63% must be supplied with the wells, often traditional. Overall, permanent access to drinking water is limited to 40% of the Chad population [Ramel., 2007].

These many distortions cause a laxity in the management of water resources which has as its

corollary the energy deficit, the recrudescence of the hydrous origin diseases, the repeated flooding, the environment degradation, the increased pollution of water resources, the unequal distribution of drinking water, etc. These consequences constitute elements that support the pauperization of the populations and significantly block the sustainable development efforts. In this context, it will be difficult for Chad to achieve or at least to approach the Millennium Development Goals (MDGs). However, some creditable initiatives are taken to slow down this disaster and to adjust the management of water resources towards a more comprehensive and durable option.

Table 2: The Institution Working in the Water in Chad

Organisms	Ministries and structures	Actions
Execution Organizations	Ministry of water	To develops, implements and evaluates the state policy on production, transport and distribution of water; central role in the management and protection of water resources at the institutional level. Plans and schedules the actions of urban water supply, village, pastoral and sanitation; organizes, controls and monitors the maintenance of hydraulic equipment
	Ministry of Public Health (Hygiene and Sanitation Division)	To develop legislation and regulations relating to environmental health, sanitation, quality of drinking water, import and marketing of all products sanitation provides monitoring of compliance, ensure the respect of these laws and regulations.
	Ministry of Territorial Administration	Intervenes in the water framework and sanitation through the decentralized communities (municipalities, communes), develop the strategies of intervention in case of disasters through the direction of civil protection
	Ministry of Environment	Prepares and develops the management plan of the environment, fight against pollution and proposes measures for sustainable management of natural resources
	Ministry of Agriculture	Coordinates and monitors the implementation of rural infrastructure works on behalf of the State or private. Executes or makes executed under its control water use programs for agricultural purposes
	Ministry of Livestock	Ensures the transfer of properties for the existing pastoral water points of the farmer's organizations and their accountability in the management and maintenance pieces works, the harmonization of the establishment of pastoral water points.
	Ministry of Infrastructure (Infrastructure Branch)	Develop planning documents and town planning, monitoring their application. Designs, carries out, monitors and coordinates geodetic and altimetry work
Organizations Management and Operating water service	Chadian Company of Water and Electricity (STEE)	Ensure management of the drinking water supply in eleven (11) urban and semi-urban of the country, analysis in these centers the physicochemical quality of these waters
	Chadian Company of Hydraulics (STH))	Ensures the tasks of the sub sector water; program the works for maintenance; designs projects and tenders; executes and monitors the wells and drilling work.
Organizations Financing	Ministry of Finance	Through the department of the treasury, he acts as the banker for the state financing of projects within the Public Investment Budget (BIP). He is responsible for planning and negotiating funding
Organizations Research	National School of Engineering (ENTP) and Faculty of Applied and Exact Sciences (FSEA)	These organizations are generally under the Ministry of superior teaching and Scientific Research allows the structures cited above to complete their missions in the area of water and sanitation.
Actors not Institutional (National and International NGOs) Offices of Education (BE)),	BELACD, SECADEV, GTZ, AFRICARE	Realize wells and drilling and provide formation of the communities maintenance and sanitation works
	WORLD VISION TCHAD	Realize wells, drilling, latrines in the schools and health centers including formation of the water managers committees in the management and sanitation.
	CARE INTERNATIONAL	Realize the fire hydrants and formation of managers committees

Note: BELACD: Office of Research and Connection of Charity and Development; **SECADEV**: Catholic Aid for Development; **GTZ**: Deutsche Gesellschaft Für Technische Zusammenarbeit GmbH (Germany Society for Technical Cooperation)

2.6 Assets related to the management of water resources in Chad

Chad has despite the situation, at the very least deplorable observed, the elements being able to help it to reorient towards a more sustainable management of water resources.

The Ministry of Water is an institutional structure that will respond to supreme matters relating to water. Why he should arm himself with a qualified staff with adequate resources and strong determination in the management of water resources. The structure would

benefit to make its self-criticism in order to receive its current functioning and trying to reframe its actions to deal with new challenges including the challenges of Integrated Water Resources Management. The water resources are known and it is quite simply necessary to monitor the collection and the data processing. This will make it possible to update the data on water resources of Chad in order to project development to be made for an equitable management.

Chad belongs to several committees under regional, regional, continental and international organizations which work relating to water. It was ratified as part of its various treaties agreements that can guide its action within the framework of the management of its water resources. Chad has also basic texts well enough just waiting to be improved. Its assets testify of the willingness of the state and non-governmental actor's to bring solutions to a management which every day has huge gaps and malfunctions. It is important to revisit the management issue of the water resources in Chad in order to propose way sand means towards an equitable, total and qualification.

3. Discussion

The important degradation of water resources, its ineluctable rarefaction and its approximate management in Chad pose serious health problems, town planning, economy and trade. Despite the multitude of state structures, Para state and private, water resources in Chad are conspicuously absent from dynamic framework to govern its management. The sectoral actions should be reviewed to take into account all aspects related to management of water resources. In this sense we needs appropriate laws, effective regulations, operative institutions and incentives measures to ensure the public interest. Targeted actions should tackle the following points:

The establishment of water resources policy. Indeed, it is important to define a general policy of water which will be responsible to direct the decisions to be given within the framework of the sustainable management of water resources. This requires strong political willpower as regards on water resources. The key is to put a voluntaristic policy resolutely turned towards a sustainable development of water resources. UNESCO believes for this reason that, the world crisis of water is mainly a crisis of government systems that "determine who receives which quantity of water, when and how and who decides, who are entitled to the water and ancillary services.

Laws and institutions implementation. It is important to create an institutional, legal and regulatory environment favorable to the smooth functioning of the integrated water resources management [GWP TAC., 2000]. For this purpose, it is necessary to establish a legal framework inside of which the rights and the obligations relating to water will be clear and facilitate its rational use. Similarly, the various institutions would gain to synchronize their actions in order to avoid divergences and of wasted time and energy. Multi-sectoral actions developed within a supreme dynamic framework governing water management constitute a track to be explored. The creation of a coordinating body for all institutions and users of water resources could be on the organization of this regulatory body. Placed under the Ministry of Water, this body will take care of informing the country through the water code to allow its implementation. This body will be composed of competent managers in the field of water management.

Reinforcement of the institutional capacities makes it possible to improve yields. In the context of integrated water resource management, we understand by development potentials the sum of the efforts aiming to stimulate, strengthen and exploit competences and capabilities of the individuals and the institutions at all levels (local, national, regional or international), so that they can progress more easily towards a more general goal. At the basic conceptual level, the reinforcement of the capacities involves to make individuals and organizations more autonomous and better equipped with appropriate tools and sustainable resource that can help them to solve their problems and to dissuade them

to attempt direct arrangements, but superficial. A relevant development potential results in increased effectiveness of individuals and institutions, which are better capable of providing products and services on a sustainable basis. For this purpose, the training coupled together with incentives measures must be performed. The development of human resources through training, education and availability of information are key elements of the capacities reinforcement. However, training only is not sufficient. If we want to take advantage of new skills and new ideas, it is important that the institutions and individuals profit from incentives assistances to modify their practices and their angles of attack. These incentives measure must be compatible with the general objectives of the institutions affected. Now, the reinforcement of the institutional capacities cannot be done without the development of human resources. The capacity of an institution to adapt of the demand evolution depends on its ability to adapt its human resources, like the knowledge, the perspectives and competence of its employees [GWP TAC., 2000].

Participation from the top to the base: To guarantee the effectiveness, the equity and the sustainability of the integrated water resources management, a profound change must take place within the institutions. It is necessary to encourage a participation of all the recipients from top to base and from base to top: From the nation to the village or municipality, or from the small watershed to river basin. Moreover, it is necessary to respect the principle of subsidiarity, in virtue of which the actions are undertaken at the lowest possible level.

4. Conclusion

To monitor progress made on the way to the goals of development, we need benchmarks. Those take the form of indicators and statistics precisely defined which can be interpreted beyond the numbers that compose them to get indication on the location and orientation of the system or process being measured [UN-Water / WWAP., 2006]. In this context, the context of water resources management in Chad presents uncertain figures and signs. This testifies a deleterious context where the water resources management is stammering and where it is advisable to scan and to apply the Integrated Water Resources Management (IWRM). It does not constitute a panacea but an alternative to improve water resources management and to contribute in short-term to achieve the Millennium Development Goals and in long-term to sustainable development. However, South Africa there already engaged and harvests the first results on the level of its growth and it is appropriate for Chad and other developing countries to do likewise.

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