Processing and decisions relating to water resources data: The case of Morocco

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Abstract. The national water strategy has been an essential vector of government strategy for a long time. The management of water resources is an integral part of the economic development of Morocco. Nevertheless, the definition of the strategic axes of this component and the adequate decision-making depends directly on the collection and use of all the data relating to water resources.

If big data technologies present a suitable solution to ensure optimal and rapid use of its data, the success of functional and technical designs can only be provided after total control of the processing and decision-making processes relating to the water domain.

In this paper, we will try to identify the aspects relating to the processes of data collection, processing, consolidation, and decision-making through the use of the results of field surveys and interviews with business managers.

1 Introduction

Water is an important project that continues to increase our methodologies and our management strategies through the evolution of our scientific means and measures on the one hand and the accumulation of data necessary for the various measurements and models. On the other hand, but if this evolution continues to advance, collecting and accumulating several other climatological, geological or meteorological data for more reliable and realistic models is the new approach used, especially with technological tools.

However, the new challenge for researchers is the exploitation and analysis of the exorbitant amount of multidimensional data for decision making → Big Data analysis.

2 Context

The central part of this operation is the data collection before the proc. Indeed, the data relating to water resources are practically collected integrally through the Water Basin Agencies (ABH) and consolidated in the General Directorate of Water by the law on water which stipulates that information systems are bricks that make up the central information system[1] and also starting from the definition in which it is declared that an information system is defined as the set of components that collect, process, store and produce data and information[2,3,4].

Therefore, it is a matter of studying and defining this process of collecting, consolidating, and processing data because the information is the result of the processing of the data provided as part of a transformation process[5].

At the end, the main goal is to provide a global view of the activities to an organization managers so as to facilitate their decision-making.[6]

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3 Methodology

To carry out this study, an interview guide was done for collecting various information concerning the cited process, starting from the following provisional diagram between the ABH and the General Directorate of Water: [7]
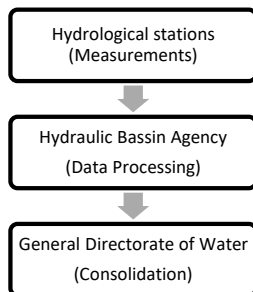
Hydrological stations
(Measurements)

Hydraulic Bassin Agency
(Data Processing)

General Directorate of Water
(Consolidation)

Figure 1: Data Processing

3.1. Interviewees

The actors concerned by the interview guide are key actors who are managers acting directly on the process in Figure 1:

Actor interviewed	Organization	Role
Head of the Water Resources Division	Directorate General of Water	Senior Water Resources Data Manager
Head of the Hydrology Service	Directorate General of Water	Operator and manager of hydrological data in DGW
Head of the Water Resources Management Division	HBA Errachidia	Responsible and actor of data relating to water resources from measurement stations
Head of the Organization and Information Systems Division	Directorate General of Water	Actor and IT provider for the consolidation of data relating to water resources

Figure 2: Actors in the interviews

3.2 Interview guide

The interview guide is established according to 5 phases allowing the following elements to emerge:

Phase	Goal
Positioning	Information on the quality of the person and his entity
Introduction	Attributions, data (Type, volume, Big data or not ...), type of exchange with HBA / Central
Centring	Gestion des données, échange des données, attentes du SI
Deepening	Data management, data exchange, IT expectations
Conclusion	Decision-making experience, recommendations

Figure 3: Important points of the interview guide

4 Results & comments

The interviews made it possible to consolidate a certain number of observations and results, which make it possible to identify this decision-making process relating to water management on the one hand and to see the expectations in terms of the need for improvement from the actors on the other hand.

As a result, we had the following results:

Volet	DGW	HBA
Data	Water data is consolidated from ABH	The measurement stations and measurement campaigns are the sources of the data that will be sent to the plant
Information system	Focused around the Badre21 water resources database, but there is no automatic synchronization with the HBAs	Information systems are not standardized in the HBA: each one develops it IS as needed
Decision making	Depending on the case	The decision was taken through Leadership
Big Data	Water resources Data can be an object of Big data	Water resources Data can be the object of Big data
Data sharing	Willing to share data with other water stakeholders, mainly through a national water information system	Data shared with the Central as needed
Expectations	Realization of decision-making IS shared with the HBAs	Completion of an IS that meets the needs of improved information processing

Figure 4: Results of interview guides

5 CONCLUSION

If the current situation of the collection and the flow of water data resources require improvements to meet the needs of a standard and global strategy concerning water management, the desire to create a system decision-making information and the sharing of data between stakeholders in the water sector present important beginnings to allow rapid development in this direction. In addition, Big data analysis is demanded by all those in charge in the sense that it will make it possible to reliably exploit the various data relating to water resources by even introducing modules relating to geographic information systems[8] in order to build a National Water Information System (NWIS) in Morocco.[9]

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