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Global water governance and water rights through the prism of Canaan, a slum apart in Haiti

La gobernanza mundial del agua y los derechos sobre el agua a través del prisma de Canaán, un barrio marginal de Haití



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Abstract

In Haitian cities, the disorganization of urban planning most often leads to the creation of new human settlements, which lack basic services, such as the provision of drinking water and sanitation. The proliferation of slums has an unfavorable effect on the hydrological cycle by reducing the permeabilized surfaces, causing significant disturbances in the recharge of groundwater. Furthermore, the impact of global changes on cities today is causing water scarcity, which makes it difficult to manage water resources effectively. Taken in the prism of environmental conditions and the way in which the metropolitan area of Port-au-Prince is to be developed, this situation not only deprives the populations of the slums of this vital element, but also violates one of their fundamental rights "the right to water and sanitation". Canaan, a human establishment created following the earthquake of January 12, 2010 by presidential decree, and inhabited by the victims of this event, constitutes in itself a real field laboratory allowing the veracity of such an assertion to be tested. The objective of this work is to analyze in the light of the major trends in global water governance, the right to water, one of the fundamental human rights, in Canaan.

Keywords: right to water, water management, governance, citizen participation, hydro-social cycle, Canaan.

Resumen

En las ciudades haitianas, la desorganización de la planificación urbana conduce con mayor frecuencia a la creación de nuevos asentamientos humanos, que carecen de servicios básicos, como el suministro de agua potable y saneamiento. La proliferación de barrios marginales tiene un efecto desfavorable sobre el ciclo hidrológico al reducir las superficies permeabilizadas, provocando importantes perturbaciones en la recarga de las aguas subterráneas. Además, el impacto de los cambios globales en las ciudades de hoy está provocando escasez de agua, lo que dificulta la gestión eficaz de los recursos hídricos. Tomada en el prisma de las condiciones ambientales y de la forma en que se va a desarrollar el área metropolitana de Puerto Príncipe, esta situación no solo priva a las poblaciones de los barrios marginales de este elemento vital, sino que además viola uno de sus aspectos fundamentales. Derechos "el derecho al agua y al saneamiento". Canaán, asentamiento humano creado a raíz del terremoto del 12 de enero de 2010 por decreto presidencial, y habitado por las víctimas de este hecho, constituye en sí mismo un verdadero laboratorio de campo que permite comprobar la veracidad de tal aseveración. El objetivo de este trabajo es analizar a la luz de las principales tendencias en la gobernanza global del agua, el derecho al agua, uno de los derechos humanos fundamentales, en Canaán.

Palabras clave: derecho al agua, gestión del agua, gobernanza, participación ciudadana, ciclo hidro-social, Canaán.

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1. INTRODUCTION

Large cities in developing countries are, among other things, characterized by disorganized urban planning. Rural-urban migration is on a larger scale and government control of the urbanization process is often deficient, leading to a disorderly territorial expansion of the city (Dumas, 2018). The phenomenon of uncontrolled precarious urbanization, observed in the urban spaces of cities in the South, most often leads to the creation of new human settlements, which are deprived of basic services, such as the supply of drinking water and water sanitation. In the absence of planning and control of land use, the territory suffers a significant loss of plant cover (Sachs, 1981; United Nations, 2015).

The disorderly urban sprawl generates an artificial use of the grounds by an urban development which is most often precarious. This form of use is not without consequences on the health of the inhabitants and on the biological balance of natural ecosystems (Scalenghe and Marsan, 2009). Indeed, the proliferation of slums in the cities of the South, resulting from the mismatch between population growth and certain choices of urban space planning policies, has an unfavorable effect on green spaces through deforestation, hydrological cycle by reducing the permeability of surfaces. This urban social phenomenon causes significant disturbances in the recharge of groundwater and an increase in the rate of storm water runoff (Arcova et al., 2003). For Arnold and Gibbon (1996), soil waterproofing has serious consequences on various dynamics of the water cycle. Porter-Bopp et al. (2011) note that waterproofing soils generates the creation of heat islands.

In Haiti, 98% of cities are located in a dual ecosystem: that of the mountains, and that of low-lying or coastal areas (Holly, 1999). The development of the slums characterizing, among others, the metropolitan area of Port-au-Prince, is in times of rain the cause of two serious environmental problems observed: (a) the dispersion of solid domestic waste (Bras, 2010), therefore of pollutants, (b) the flooding of the bottom of this urban region.

The absence of a comprehensive urban development policy explains certain environmental problems facing the metropolitan area of Port-au-Prince (Fifi, 2010). Indeed, Bras et al. (2009) report that around

35% of solid waste produced in Port-au-Prince is collected by the public service responsible for garbage collection. According to Fifi (2010), "many of the city's roads, rivers and other open areas serve as dumping grounds, causing significant health and environmental problems. Note that the inefficiency of the solid waste collection and management system can contribute not only to the pollution of available water resources but also to the emergence of infectious and chronic diseases in the population". In precarious neighborhoods near the coast of Port-au-Prince, 25% of people surveyed by Bras (2010) directly associate skin conditions, being very widespread in the area, with unsanitary conditions (lack of latrine, collection slide, etc ...) prevailing there.

In addition, dynamic regional and global pressures, such as climate change, population growth and the degradation of urban infrastructure that cities undergo today, cause water scarcity, making it difficult to effectively manage resources in water (Jérôme, 2018). Taken in the prism of environmental conditions and the way in which the metropolitan area of Port-au-Prince is to be developed, this situation not only deprives the populations of the slums of this vital element, but also violates one of their fundamental rights " the right to water and sanitation " (Jérôme et al, 2021). Canaan, a human establishment created following the earthquake of January 12, 2010 by presidential decree, and inhabited by the victims of this event, constitutes in itself a real field laboratory allowing testing the veracity of this assertion. The objective of this work is to analyze in the light of the major trends in global water governance, the right to water, one of the fundamental human rights, in Canaan.

The right to water and the dynamics of global water governance

Since the dawn of history, a vital need has accompanied humans in establishing hamlets, villages or towns: the need to have access to water (Rattu, 2015). Domestic needs (drinking, food preparation, personal and housing hygiene), irrigation of plants and the production of goods and services (especially industrial needs) are, both in developing countries and in industrialized countries, the main uses of water. The exponential increase in the population, characterized in terms of water by an increased increase in demand for water and the

generation of an increasing volume of wastewater, widens gaps or inequalities between populations and users. The deforestation of the watersheds supplying the water points, the inequitable distribution of fresh water (surface and underground) and the impact of global changes on rainfall give rise to a situation of scarcity that hydrologists call "water stress," which generate tensions between users.

In addition to its capital importance for the survival of living beings, water is a revealing element of social transformations in the interrelationships between agents/actors (Traoré, 2012). According to Torre et al., (2006), the conflict dimension is always presented as essential in the processes of land use planning, regional development or the management of various local functions, whether we are interested in activities linked to agriculture and water, the establishment of public infrastructure, the management of pollution and its consequences, the problems of the residential economy and peri-urbanization, or the effects of increased tourist pressure in coastal or mountain areas. Taking into account and managing the tensions and controversies that arise from the development of these different activities and sometimes hamper their progress are today considered essential, which several researchers and institutions have identified and developed a particular category of conflicts, dedicated for this purpose, conflicts of use and neighborhood (Charlier, 1999; Torre and Caron, 2002; Dziejzicki, 2003; CGP, 2005; Torre et al., 2006).

Traoré (2012) notes "The gap between the availability of water points and water requirements is widening daily. It leads all users, particularly customary leaders, to adopt certain behaviors for access to and management of water resources with regard to their social group. Indeed, the lack of water feeds the representations that social actors have of this resource in a world in full demographic explosion and socioeconomic change." The internationalization of the problems posed by the non-satisfaction of the water needs of the majority of populations, both in rural and urban areas, impose on international institutions which are dedicated to the maintenance of peace between peoples, of dignity and of human equality for the construction of a healthy planet to make the management of water-related conflicts an object of research and actions of international policy.

The right to water has its origins in the Universal Declaration of Human Rights. Indeed, the first recital

of the preamble of the said declaration, adopted by the United Nations General Assembly by 58 Member States, states: "The recognition of the inherent dignity of all members of the human family and of their equal and inalienable rights constitutes the foundation of freedom, justice and peace in the world" (United Nations, 1948). In its article 22, where water at the time was considered a social human right, it is stated "Everyone, as a member of society, has the right to social security; it is founded on obtaining the satisfaction of the economic, social and cultural rights essential to his dignity and to the free development of his personality, thanks to national effort and international cooperation, taking into account the organization and resources of each country".

The adoption of the Universal Declaration of Human Rights (UN, 1948) to that of Resolution 64/292 of July 28, 2010 in which the General Assembly recognized that the right to drinking water and sanitation was a fundamental right, essential for the full enjoyment of life and the exercise of all human rights (United Nations (2010), Tabi (2014) points out that the normative statement of the right to water was discussed and was developed within UN bodies, in particular the International Covenant on Social, Economic and Cultural Rights of 1966, and the Committee on Economic, Social and Cultural Rights. Indeed, this Committee responsible for monitoring the implementation of the 1966 International Covenant, adopted in 2002 a General Comment No. 15 entitled "The right to water" which puts an end to a period of uncertainty on the status of water right among the fundamental rights protected by the Covenant.

According to this general observation, underlines WHO (2002), "Water is essential for life and health. The human right to water is therefore fundamental for him to be able to live a healthy and dignified life. This is the precondition for the realization of all his other rights. "It is with these words that the United Nations Committee for Economic, Social and Cultural Rights today took the unprecedented initiative to include a "general comment" on water as a human right. By "general comment" is meant an interpretation of the provisions of the International Covenant on Economic, Social and Cultural Rights. The 148 countries that have ratified it will now be required to progressively achieve universal access to safe and healthy drinking water and sanitation, equitably and without discrimination.

The notion of equity, which refers to the quality consisting in providing each human being with the minimum quantity of drinking water allowing him to lead a healthy life by reference to the statements of resolution 64/292 (United Nations 2010), as well that the notion of absence of discrimination, translating in this analysis the absence of distinction and treatment in the supply of water to the populations of the slums of the metropolitan area of Port-au-Prince, in particular Canaan, in relation to the rest of the community, lead to a questioning of the role accorded to water in the definition of policies for the development and urban rehabilitation of precarious neighborhoods in Haiti.

2. METHODOLOGY

Environmental and historical context of the creation of Canaan

In recent decades, Haiti has recorded several major environmental events (floods, droughts, cyclones and a magnitude 7.2 Richter scale earthquake). Most of these natural phenomena usually turn into natural disasters that impact the life and property of the

population. They also lead to the displacement and unplanned relocation of some inhabitants. The earthquake of January 12, 2010, among other things, left nearly 300,000 dead, 300,000 injured and over two million displaced. This event made the metropolitan area of Port-au-Prince the object of very strong population growth and a massive extension of precarious urban spaces. This development is the result of both the natural growth of the population, a strong influx of migration and the lack of housing availability. Access to drinking water and sanitation infrastructure in the newly densified areas has since been systematically lacking. This is typically the case with Canaan, which at the end of 2016 had more than 250,000 inhabitants in an almost uninhabited area before the 2010 earthquake (Bodson et al, 2017).

Presentation of the study area

Canaan's geographic coordinates are 18° 38' 46" N, 72° 16' 23" W. It is located in the far north of the metropolitan area of Port-au-Prince, approximately 18 km from downtown town, precisely on a dwelling called formerly Corail Cesselesse, of the communal section of Varreux II, Commune of Croix-des-Bouquets. Figure 1 presents the map of Canaan.

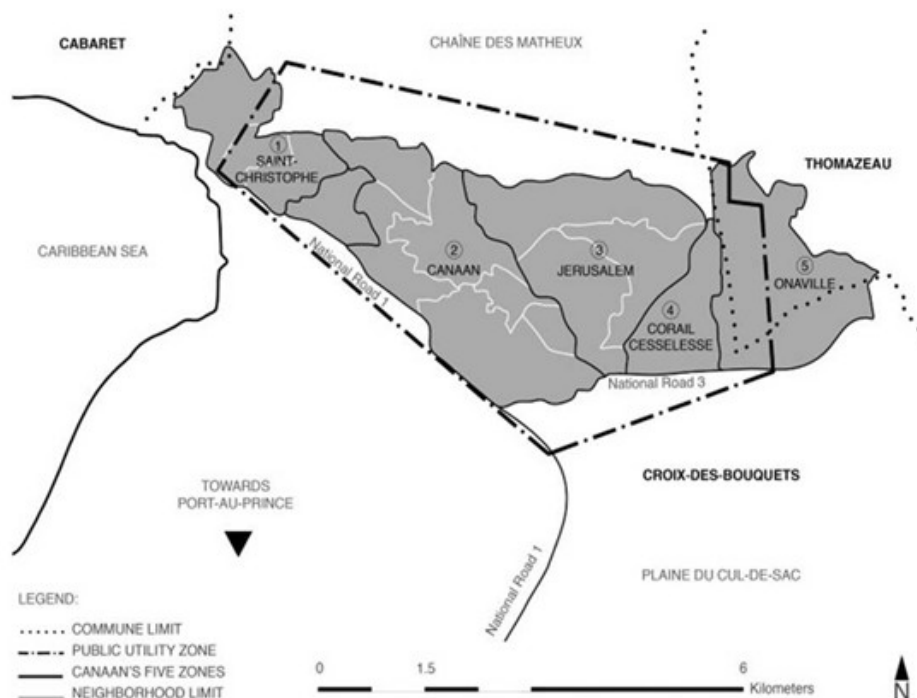


Figure 8: Map of Canaan (Petter et., 2020)

According to OXFAM GB, (2014) “The areas of Canaan, Jerusalem and Onanville are located in the “Low Mountains” agro-ecological area of the commune of Croix-des-Bouquet. This area has an annual rainfall between 1000mm and 1400mm. The Canaan area is located between the fertile Cul-de-Sac plain and the foot of the deforested Chaîne des Matheux. Soil degradation, the absence of vegetation in the watersheds, the exploitation of quarries have reduced infiltration and retention potential, increased hydrological threats and land movements and left dry aquifers”.

Before the earthquake, the territory was almost unoccupied. As such, it was the subject of a first declaration of public utility in 1971 for tourist purposes. A tourism master plan, drawn up by the Western Tourism Development Bureau, was being implemented before the earthquake, while various large-scale private projects were being considered as part of the North Pole Urban Development Master Plan (Verret et al., 2016) The decree of March 22, 2010 declaring land in the Canaan area of public utility "for the purpose of relocating victims of the earthquake of January 12, 2010 (Le Moniteur, 2010). Decree declaring of public utility the properties extending from the angle of the Rivière Bretelle to the national road number 1 through Bon Repos and Corail-Cesselesse forming a polygon with the area commonly called Cucumber, article 1, and March 22

decree. Opened the field to a radical and rapid transformation of this space. From undergrowth to makeshift camps sheltering victims from the surrounding area and elsewhere and migrants from provinces, Canaan has urbanized into a "new city" of nearly 300,000 inhabitants. There followed a very rapid "spontaneous" occupation of the territory. Photo 1 (OXFAM GB, 2014) shows the uncontrolled expansion of Canaan especially in the area of alluvial fans.

The environmental assessment carried out by OXFAM GB (2014) shows that hydrological threats are linked mainly to gullies, which capture runoff from large watersheds in the northern mountains. The immediate consequences of tropical storms, hurricanes and cyclones are rainfall of several hundred millimeters in a few hours; the gully causes extensive flooding and a risk of erosion for Canaan, the Coral Camp and areas of Onanville.

In addition, the Canaan area is the most socially and environmentally vulnerable in the commune of Croix-des-Bouquets. Canaan lacks urban infrastructure and has a special environment: schools, hospitals, insufficient water resources, drought etc. Canaan’s main productive activities are rock mining and quarrying, which are unchecked and without safety standards and which increase both erosion and the threat of land movement. Photo 2 shows a facade of the quarry extraction areas.



Photo 1: Uncontrolled expansion of Canaan in the area of alluvial fans (OXFAM GB, 2014)



Photo 2: Facade of quarry extraction areas (OXFAM GB, 2014)

Methods

This work is part of the Water in human settlements of the future theme of the research axis "Infrastructures and Sustainable Cities" of the Center for Research and Support for Urban Policies (CRAPU) of Quisqueya University. Within this axis, CRAPU to observe in the new slums of the metropolitan area of Port-au-Prince the role of social behavior with regard to water, by questioning the applicability of the theoretical framework proposed for the integrated management of water resources in the service of human settlements of the future by the International Hydrological Program (IHP) of UNESCO (2012) for its phase IHP-VIII. In a context of urban sprawl marked by uncontrolled demographic growth and a deficiency in urban governance, juxtaposed with very difficult socioeconomic situations, a degraded geophysical environment vulnerable to cyclones, earthquakes and climate change, the scarcity of fresh water and the pollution of available water resources, researchers from this laboratory who work on the aforementioned theme are trying to develop theoretical tools ultimately making it possible to model the social management of water in precarious neighborhoods.

Canaan, a human establishment, which is in line with the ineffectiveness of several actors in terms of urban planning, provision of basic services, development

and management of inhabited spaces, has been selected for the conduct of several surveys on water issues in the Port-au-Prince slums. Certain information obtained in Canaan on: (i) the socioeconomic characteristics of the households surveyed, (ii) the water market, has been published (Jérôme et al, 2017, 2018, 2021).

For the conduct of this work, we relied on: (i) field observations, (ii) documentary analysis (laws, decrees, acts, reports, studies), and certain not yet exploited results of the surveys carried out. .

3. RESULTS AND DISCUSSION

Summary of information on water supply and the characteristics of households included in the sample

- In Canaan, 2.5% of the heads of households attended university, 31% have a high school education, and 21.41% have completed the second cycle of Haitian fundamental education. 28.47% have completed studies for the third cycle of Haitian basic education and 8.8% have never attended school (Jérôme et al, 2017);
- Households included in the sample have characteristics similar to those highlighted by the IHSI-DIAL 2012 survey for the metropolitan area (Bodson et al, 2018);

- 92% of household heads consider themselves to be owners despite the ambiguity of the special status of the territory declared "of public utility". Whatever the motivation for arriving in Canaan (82% of household heads admit that they took refuge there under the constraint of living conditions after the earthquake), self-construction is widespread. 4.56% of the households surveyed nevertheless have a home provided by humanitarian aid (Jérôme et al, 2017, Bodson et al, 2018).
- The households in the sample have an average of 5.11 people. In the metropolitan area, this average is 4.5. There are many under 18s in the households surveyed: 2.25 on average per household, which at least partially explains the difference observed compared to the metropolitan area (Bodson et al, 2018). 93% of the water distribution points in Canaan have been built by families, and thus becomes a private water supply facility. Only 7% have a collective, associative or public status. These were built by NGOs or charitable institutions, or by a public institution or a group of people in the locality. Access to 95% of these water points must be paid for, while only 5% offer a free service (Jérôme et al, 2017).
- 25% of households spend more than 24% of their monthly income on water supply (Jérôme et al, 2017).

These results highlight the existence of several water supply services in Canaan. This diversity of suppliers can become a source of conflict between the regulator and the tax authorities on the one hand, and the priorities of these services on the other. Indeed, the development of housing in Canaan as well as its demographic growth will inevitably lead to the establishment of public systems capable of ensuring the quality of the water that will be delivered to the population. Depending on the management model adopted for the supply of this public service, and the methodology adopted to set the price of water, these public systems could find themselves in a form of competition with the providers of the early days, a situation which would lead to on conflicts between suppliers. Finally, it will be the popular that would be depriving of their right to water.

For several years, we have noticed that the concept of participation appears at the heart of discourse on sustainable development, good governance and environmental management. At each level of

intervention, underlines Gliemann (2013), users, citizens and all those who have a certain interest are encouraged to get involved and organize themselves to take part collectively in the development of their communities and in the management. of their resources. The participatory approach, a privileged tool making it possible to involve populations in an active and responsible manner, was born from the observation of the failure of intervention strategies recommended in the past, as well as from the fairly recent desire of governments to integrate the dimension participation of the populations in the development policies of their region (FAO, 1995). Participatory democracy in water management, as defined today by international, national and local institutions around the world can lead to effective participation of users /citizens and private providers/citizens. In the footsteps of the Breuil work (2004), the proposal formulated to the actors responsible for supplying drinking water on the diversity of suppliers observed in Canaan, is to arrive at socially clearing a renewed vision of the PPP (public private partnership) for the management of water services in the slums of Haiti, by giving a central place to the service of the poor populations.

The high cost of water

In interviews with economists on the high weight of water in the budget of certain families, that is to say more than 24%, the majority of them underline that in certain economies this percentage in the income of a family is the most often this is allocated to paying mortgage fees on the house.

Ashley and Cashman (2006) note that people in the developed world and the better-off in developing countries do not pay the real economic costs of water services, the poorest have to buy water from local distributors or the bottled water that they pay 500 times more than their wealthier fellow citizens.

In Canaan, the water offered is 93% chargeable. According to the indications provided by the field surveys, the average expenditure per liter differentiates between the 6 blocks constituting this human settlement (Canaan 1, 2, 3, 4, 5 Bellevue). This contrast is in all likelihood based on taking into account the different access and delivery difficulties in the two groups of sectors. Indeed, among the points there are 167 storage tanks, which are supplied by tankers coming from the boreholes of the Plaine du Cul-de-Sac. The refloating of the storage tanks is done in an interval of 5 to 90 days. On average, the

water points wait at least 20 days before a next supply by tanker.

The water supply in Canaan

In Canaan, the government, and more specifically the National Directorate for Drinking Water and Sanitation (DINEPA), is not yet involved in providing water for human consumption. The water supply is a private matter. The surveys identified 179 water points belonging to individuals, community groups and humanitarian organizations (Jérôme et al, 2017). These forms of mobilization open up new fields of research to approach the management of water in slums not only on the basis of the alternative participation of citizens / users, but also under that of the understanding of the technical objects in the supply of water in Canaan.

In fact, the vast majority of water points identified during the two surveys, i.e. 71.5%, are made up of storage tanks used for the sale of water, while non-equipped wells represent less than 3% (i.e. 2.23%), boreholes equipped with hand pumps 3.91% and collective impluviums less than 1% (0.56% or about 6 out of 1000 water points). Storage tanks cover almost the entire water supply. Hand pumps, unequipped wells and impluviums provide 7% of the available water. These equipments, works or infrastructures, or technical objects give rise, in the case of water in Canaan, to a new understanding of the assertion of Linton and Budds (2014) in which they consider that water in the hydrosocial cycle is always "produced", it is good that it is always and above all linked to a technical object. The existence and the weight of private water storage reservoirs for sale to the population, wells equipped with hand pumps in the supply of water to the population of Canaan makes it possible to segment the water market into three large compartments, each of which is controlled by a different group of players. First, we find the suppliers of storage tanks. These reservoirs are supplied with water from tank trucks coming from the Plaine du Cul-de-Sac. The drivers of these trucks get their supplies directly from the water wells. The second segment consists of the owners of private reservoirs for storing and selling water to the population. The third is represented by the users of boreholes equipped with hand pumps adopting a governance model based on a water management cooperative with a committee of three to four members. Beneficiaries of funding from international or humanitarian organizations, they organize themselves to sell water to members of the

cooperative at a cost half the price of other storage providers from the cul-de-sac plain.

The use of the water supply system in Canaan to test the applicability of hydro-social cycle theory in slum water management to some extent confirmed the hypothesis of the thinkers of this theory namely that water is a co-production of nature and societies. By maintaining the chosen experimental scale, in the future, it will be necessary to focus attention on the harmonious or conflicting relations that can develop between the actors the management methods adopted for boreholes equipped with hand pumps versus those applied in the sale of water contained in storage tanks.

4. CONCLUSION

The objective of this work is to analyze in the light of the major trends in global water governance, the right to water, one of the fundamental human rights, in Canaan.

The absence of the public authority in charge of water supply and the urgent need for the population to obtain water, have enabled a pyramid of private and humanitarian actors to offer water to the population. by integrating the natural, social and political contexts in which they are found, but also social issues that go beyond the technical dimensions of the water cycle, particularly in Canaan.

The information provided by the surveys identifies two technical objects that contribute more than 90% to the functioning of the "water supply system" in Canaan. Storage reservoirs and boreholes equipped with hand pumps now allow not only to understand the relationship that the population has with water, but to identify the types of actors who have access, control and control the resources in water. The reservoirs provide a sales service according to the law of the maximum profile, while the boreholes approach the water market under the basis of a governance model based on a water cooperative and participatory management where users contribute in the definition of the actions to be implemented from the profits generated by the sale of water.

In the future, it will be necessary to analyze the contribution of water infrastructure in the reconfiguration of space, to assess the level of application of the theory of the hydro-social cycle in the supply of water to the population of this slum. It would then be relevant to approach the model of

governance and / or management of water in Canaan from the angle of reconciliation between the "hydro-social cycle" and the hydrological reality.

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REFERENCES

- Annan K. (2001). Message du 22 mars 2001 pour la Journée mondiale de l'eau. "Pouvoir s'approvisionner en eau potable est un besoin élémentaire et, partant, un droit fondamental", site www.worldwaterday.org.
- Arnold Jr, C. L., & Gibbons, C. J. (1996). Impervious surface coverage: the emergence of a key environmental indicator. *Journal of the American planning Association*, 62 (2): 243-258. <https://doi.org/10.1080/01944369608975688>
- Ashley, R., & Cashman, A (2006). Incidences du changement sur la demande à long terme d'infrastructures dans le secteur d'eau. OCDE-Organisation de Coopération et de Développement Économiques. Programme de l'OCDE sur l'Avenir. Les infrastructures à l'horizon, 2030. DOI:10.1787/9789264024014-6-FR. ISBN 92-64-02400-X
- Bras, A., *Éléments pour une définition de la problématique de la propreté urbaine en Haïti : Le cas de Port-au-Prince*. Thèse de Doctorat (en cotutelle). Lyon: INSA de Lyon / Université Quisqueya, 2010, 213 p.
- Bras, A., Berdier, C., Emmanuel, E., Zimmerman, M. Problems and current practices of solid waste management in Port-au-Prince (Haïti). *Waste Management*, 2009, vol. 29, pp. 2907-2910. DOI: 10.1016/j.wasman.2009.07.015
- Breuil, L. (2004). *Renouveler le partenariat public-privé pour les services d'eau dans les pays en développement: comment conjuguer les dimensions contractuelles, institutionnelles et participatives de la gouvernance* (Doctoral dissertation, Doctorat, Sciences de l'eau-Gestion, ENGREF).
- Caron, A., Torre, A., 2002, « Les conflits d'usage et de voisinage dans les espaces ruraux : une analyse économique », in PERRIER-CORNET P. (dir.), *À qui appartient l'espace rural ? Enjeux publics et politiques*, éditions de l'Aube/DATAR, La Tour d'Aigues, p. 49-78.
- CGP (Commissariat général du plan). *Projet Manon*. (2005). *Conflits d'usage à l'horizon 2020: quels nouveaux rôles pour l'État dans les espaces ruraux et périurbains*. Documentation française.
- Charlier, B. (1999). *Géographie des conflits environnementaux depuis 1974*. Géographie. Pau, Université de Pau, 543.
- Chirac J. (2003). *Message au Troisième Forum Mondial de l'Eau*, mars 2003.
- Conférence internationale sur l'eau et l'environnement, Dublin, 1992, *Déclaration de Dublin sur l'eau dans la perspective d'un développement durable*, Dublin. http://www.unesco.org/water/wwap/milestones/index_fr.shtml
- Dumas, R. M. (2018). *Les enjeux politiques de la gouvernance environnementale: le cas de la gestion des eaux de surface à São Paulo*. Mémoire de Maîtrise en sciences géographiques, Université Laval. Québec: Université Laval. 201p.
- Dziedzicki, J. M. (2003). II. *La gestion des conflits d'aménagement entre participation du public et médiation*. *Annuaire des collectivités locales*, 23(1), 635-646.
- FAO (1995). *Approche participative, communication et gestion des ressources forestières en Afrique Saharienne : bilan et perspectives*. Disponible sur : www.academia.edu/15169730 . Consulté le 28 aout 2016.

- Fifi, U. (2010). Impacts des eaux pluviales urbaines sur les eaux souterraines dans les pays en développement—mécanismes de transfert des métaux lourds à travers un sol modèle de port-au-prince, Thèse de Doctorat (en cotutelle). Lyon: INSA de Lyon / Université Quisqueya, 2010,.
- Gliemann M.O. (2013). Une gestion participative de l'eau ? La politique sud-africaine de gestion locale de l'eau. Lesedi, les carnets de recherche de l'Institut Français d'Afrique du Sud. Disponible sur : <http://ifas.hypotheses.org/211> . Consulté le 23 février 2017.
- Haïti (Doctoral dissertation, Université Quisqueya (Port-au-Prince); Institut National des Sciences Appliquées de Lyon).
- Holly, G. (1999). Les problèmes environnementaux de la région métropolitaine de Port-au-Prince. Port-au-Prince, ouvrage collectif, Commission pour la commémoration du 250^e anniversaire de la fondation de la ville de Port-au-Prince. Port-au-Prince (Haïti) : Presses nationales. 174p.
- Jérôme, Y., Alexis, M., Telcy, D., Saffache, P., Emmanuel, E. (2021). The challenge of water in the sanitary conditions of the populations living in the slums of Port-au-Prince: The case of Canaan. In .: Environmental Health (ISBN 978-1-83968-721-1). On press.
- Jérôme, Y. (2018). Cycle hydrosocial et la gestion de l'eau dans les bidonvilles du sud : étude de cas de Canaan. Communication orale – 20^e rencontre internationale d'APERAU, 19 au 22 juin 2018, Lille, France.
- Jérôme Y., Emmanuel E., Roy P.-M., Bodson P., (2017). The issue of water in slums development in Haiti: the case study of Canaan. Aqua-LAC, Vol. 9 (1):87-97.
- Linton J., (2010). What is water? The history of a modern abstraction. Vancouver: UBC Press.
- Nations Unies (2010). Le droit de l'homme à l'eau et à l'assainissement. Résolution du 28 juillet 2010 de l'Assemblée générale de l'ONU., Doc. NU.A/RES- 64/292
- Nations Unies (1948). Déclaration universelle des droits de l'homme. Département de l'information de l'ONU. <https://www.un.org/fr/universal-declaration-human-rights/index.html>
- Noël, R. (2012). Reconstruction et environnement dans la région métropolitaine : Cas de Canaan ou la naissance d'un quartier ex-nihilo. Port-au-Prince: Group URD. http://www.urd.org/IMG/pdf/ReconstructionetEnvironnement_Rapport_Canaan_Nov2012.pdf
- Nuttle, W. K., (2002). Is ecohydrology one idea or many? Hydrological Sciences Journal, 47(5), 805-807. doi: 10.1080/02626660209492983.
- OMS (2002). Le droit de l'être humain à l'eau est donc fondamental. Observation générale N°15. Pacte International relatif aux droits sociaux économiques et culturels (PIDESC). Communiqué de presse de l'Organisation mondiale de la santé, 27 novembre 2002.
- OXFAM GB (2014). Rapport final d'évaluation technique des menaces naturelles de la commune de Croix-des-Bouquets (Haïti) - Guide méthodologique. Londres: OXFAM GB. 77p. https://www.preventionweb.net/files/38544_38544rapportconsultationcartographi.pdf
- Petter, A. M., Labbé, D., Lizarralde, G., & Goulet, J. (2020). City profile: Canaan, Haiti-A new post disaster city. Cities, 104, 102805.
- Porter-Bopp, S., Brandes, O. M., Sandborn, C., & Brandes, L. (2011). Peeling Back the Pavement: A Blueprint for Reinventing Rainwater Management in Canada's Communities. POLIS Project on Ecological Governance, University of Victoria & Environmental Law Centre, University of Victoria. 72p. ISBN 978-1-55058-389-2
- Scalenghe, R., & Marsan, F. A. (2009). The anthropogenic sealing of soils in urban areas. Landscape and urban planning, 90 (1-2):1-10. <https://doi.org/10.1016/j.landurbplan.2008.10.011>
- Schmidt J. J., (2014). Historicising the Hydrosocial Cycle. Water Alternatives, 7 (1), 220-234. Disponible sur: www.water-alternatives.org/index.php/alldoc/articles/vol7/v7issue1/242-a7-1-13/file

- Smets, H. (2004). Droit Effectif a l'eau Potable, Un. Envtl. Pol'y & L., 34, 175.
- Soriano, F. C. A., de Cicco, V., & Bueno, P. A. R. (2003). Precipitação efetiva e interceptação das chuvas por floresta de Mata Atlântica em uma microbacia experimental em Cunha-São Paulo. *Revista Árvore*, 27(2), 257-262.
- Tabi, M. T. (2014). L'accès aux nouveaux droits fondamentaux est-il compatible avec le principe de contreparties? Le cas du droit humain à l'eau. <https://halshs.archives-ouvertes.fr/halshs-00952294>
- Torre, A., Aznar, O., Bonin, M., Caron, A., Chia, E., Galman, M .. & Kirat, T. (2006). Conflits et tensions autour des usages de l'espace dans les territoires ruraux et périurbains. Le cas de six zones géographiques françaises [*]. *Revue d'Économie Régionale & Urbaine*, 3(3), 415-453. <https://doi.org/10.3917/relu.063.0415>
- Traoré, R. (2012). Eau, territoire et conflits: analyse des enjeux de la gestion communautaire de l'eau au Burkina Faso: l'exemple du bassin versant du Nakambé (Doctoral dissertation, Université Toulouse le Mirail-Toulouse II). NNT : 2012TOU20035. <https://tel.archives-ouvertes.fr/tel-00718597>
- UNESCO (2012). Plan stratégique de la huitième phase de son Programme Hydrologique International (PHI-VIII : 2014-2021).
- United Nations (2015). *Transforming our world: the 2030 agenda for sustainable development*. New York, NY: United Nations.

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