

Evaluation of Flood Management Policies in the City of Yagoua (Far-North Region, Cameroon)

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Abstract

For several decades, be it the equatorial or tropical zone, the climatic variability helping, the Cameroonian cities are subjected to the phenomenon of flooding. Located at 10°20' and 11°35' north latitude at 14°55' and 15°10' east longitude, Yagoua, a locality with a tropical Sudano-sahelian climate, is no exception about this situation since each rainy season, it registers cases of temporary stagnation and prolonged water. Floods here are becoming more and more an urban problem. This contribution aims to highlight the inconsistency of the fitting out policies undertaken in terms of sanitation of the urban perimeter. The hypothesis suggests that the cumulative actions of the institutional actors, their partners and the local populations in net growth, involved in the prevention and the direct management of this water disaster, seem to suffer from a lack of anticipation in the matter and make the environment more vulnerable. Through a methodology based on: documentary research in academic institutions, the analysis of annual reports and interviews with officials of technical and administrative services (departmental delegations of the Ministry of Housing and Urban Development; that of the service of meteorology of transport, urban planning services, hygiene and health services of the council), the participative approach, the direct field observations, surveys of 279 households, it appears the results according to which: due to its flat topography, with almost no slopes (about 0.01%), of annual rainfall values increasingly between 750-1200 mm, Yagoua is a locality exposed to flooding. The various fitting out initiated before, during and after the rainy season by the actors (installation of drainage structures and maintenance of existing ones) do not contribute to reducing the scale of the phenomenon, thereby making the city a place of bad living. Remedying this is simply to encourage the pooling of skills and the regular monitoring of sanitation activities.

Key words: climatic variability, floods, fitting out, urban perimeter, Yagoua, Far-North, Cameroon.

Introduction

The recurrence of certain natural disasters causes concerns in public opinion (Ovono, 2015). These are inexorably linked to the climatic variations that have been going on in recent years and will be crescendo if not at the rhythm of the seasons, and depending on the geographical environment (Mohamed Ahmed, 2006). More and more, phenomena appear with consequences that strongly contribute to limiting the improvement of the living environment of the people of the planet. These disasters include storms, hurricanes, excessive snowfall, tsunamis, earthquakes, volcanic eruptions, fires and floods. At the forefront of these events during rainfall periods, flooding remains one of the major phenomena at the international, national and Local level (Wade and al., 2009); This natural phenomenon can be caused by profound changes, carried on a watershed by human action or caused by the vagaries of abrupt or intense climatic variability (Mbézélé, 2011).

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The urban perimeters are subject to significant flood risks due to different factors: insufficient or absent sewerage systems, insufficient upstream storage basins and excretions, presence of obstructions to flow and Important development of urbanization leading to an increase in runoff flows (Najem, 2011). The floods are certainly seasonal, but their arrival results in sometimes irreversible consequences in urban environments where anarchy exists in terms of organization and land tenure.

Because of the population growth and lack of adequate urbanization plans or their ill-health, the populations, dictated by extreme poverty and their social incivility, are settling in an anarchic manner in the risk areas and do are not generally involved in sanitation activities. Coupled with the laxity of public authorities, there is an unparalleled unsanitary situation in the urban environment. The latter, instead of being a good place to live, becomes a burden for city dwellers. Even more, arrangements are made without studies and follow-up of the work beforehand. Abundant literature has been produced as part of the flood studies. Among the works known, we can refer to those whose reports are reduced to the proposal of the strategies of management of the phenomenon. Meva Abomo (2010) proposes as a solution the creation of a watershed council, a listening, dialogue and action structure that will maximize popular participation in water management. Wade Souleye and Rudant (2009), raising awareness among decision-makers about the importance of implementing sustainable development policies. Beucher and Rode (2009) Stress the emphasis that must be put on prevention (reframing of institutional and legal measures), more than on protection (technical aspect). Rudant and Souleye (2008), call for the use of remote sensing and GIS for the management of certain risks. However, they have not identified the limits of pre-and post-flood actions.

The city of Yagoua is a particularly interesting field of study for an analysis of the problem of the management of the flood phenomenon because of the climatic variability in recent years. Crossed by two rivers (Mayo) and along the Logone River, more than half of the neighbourhoods of this town are still prone to flooding. The history of the phenomenon is marked by serious damage, the most catastrophic of which dates back to the years 1988. The recent large-scale floods, being those of 2012. They were caused by the significant increase in the volume of water in the dead arms of both streams (Ovono, 2015). The speed of urban population growth, as well as the weakness of land law, leads to anarchic and precarious urbanization, which is aware of constructions made in flood-prone areas; This would train the flow of the first waters into the dwellings located at the outskirts of the Mayos and the low-sloped spaces.

Some quarters (Danayre I and II, Zaba, Siratare) lie on the dead arms of Danay mayo. The impermeability of the clay-sandy soil, coupled with the lack and ageing of the drainage structures, remains the main reason for this recurrent situation. One of the constant problems that continues to affect the urban environment in the city of Yagoua remains the control of water drainage.

The households in these areas are regularly inundated. Interviews with neighborhoods leaders, focus groups and field surveys of households reveal that water penetrates several times in increasingly precarious homes during each rainy season and causes significant damage. How do we understand that after the great floods of 2012, city managers have still not recognized the need to take measures to reduce the risk of flooding? What sustainable strategies to initiate for a more attractive and resilient city? These are the questions that this contribution tries to bring to the elements of response.

Methodology

The methodological approach undertaken is in these phases: the phase of direct observation, individualized interviews, household surveys and the collection of secondary data, processing and analysis of information.

Secondary data were collected from the various actors involved in the urban disaster management and planning issue: The division and the sub-division, the municipality of Yagoua, the division delegation of the ministry Habitat and Urban Development, the meteorological service of the Transport delegation for rainfall data. The direct observation phase focused on the identification of certain collective infrastructures built in the city (drainage, draining, water drainage) their condition, the maintenance or sanitation frequencies of The urban environment by the different actors; The goal is to see their influence on the regularity of the floods. In view of the high population size of the city based on the 2005 census results, i.e. 37867 souls, a 1% survey is carried out. Thus, in a random way and by the absurd, 279 households were investigated. This has confirmed the Incivic character of the local people. Interviews with resource persons (administrative authorities, traditional authorities) have made it possible to highlight the state of laxity of the decision-makers with the reality on the ground, in particular what is planned, realized and not Realized.

In short to raise the limits of their activities. The cartographic supports have allowed to circumscribe and materialize the study area, the spatial aspects of the city of Yagoua. Data processing, both manually and through computer software, if any, of SPSS 20, Excel 2007 and Map Info 8.5, resulted in the production of results in text, tables, diagrams and maps.

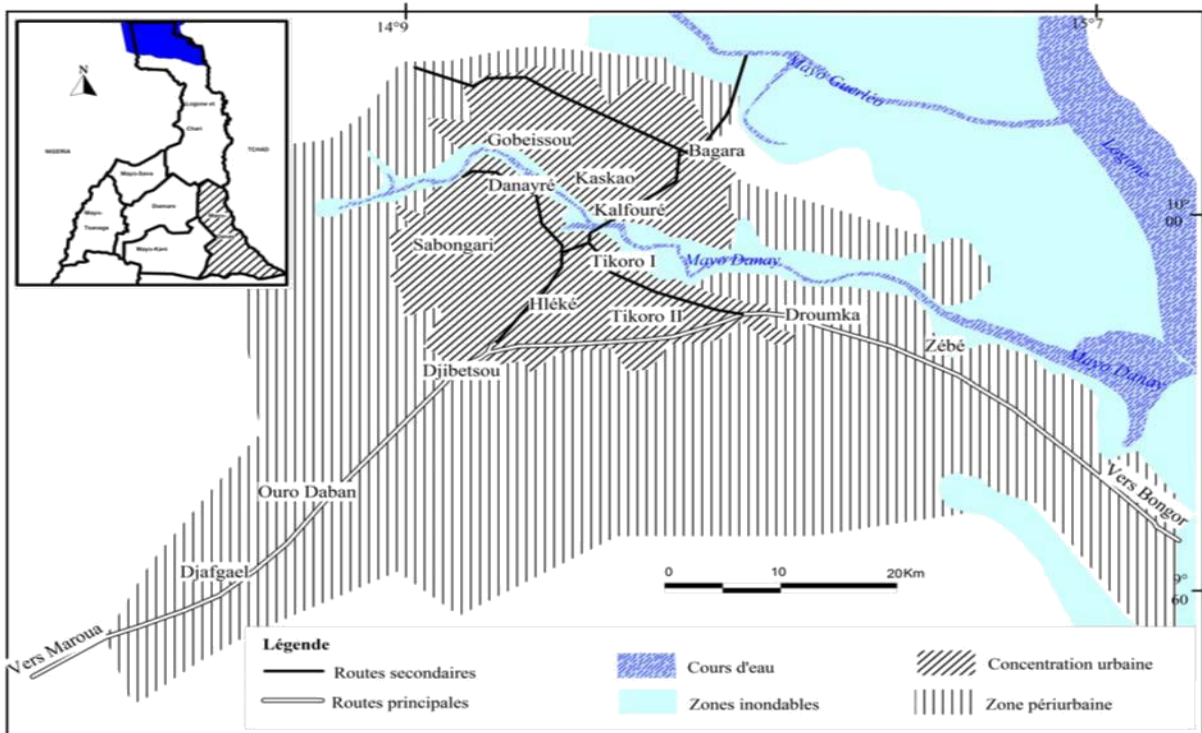
Results and discussion

1. Flood-prone plain

Some regions of Cameroon have become areas of preference for flooding (Ovono, 2015). Each year, at the same time, in the rainy season and practically in the same places, the populations are meshed with a large and abnormal volume of water that invades the living areas. Yagoua, located in the tropical zone, is one of the cities of the logon valley of the far north that does not escape this climatic catastrophe. The locality has physical characteristics that regularly predispose it to the flood hazard during the rainy season.

1.1. Anarchic occupation of space

Figure 1: Situation and human concentration of the study area



Source: MINH DU Departmental delegation, Mayo-Danay, 2012

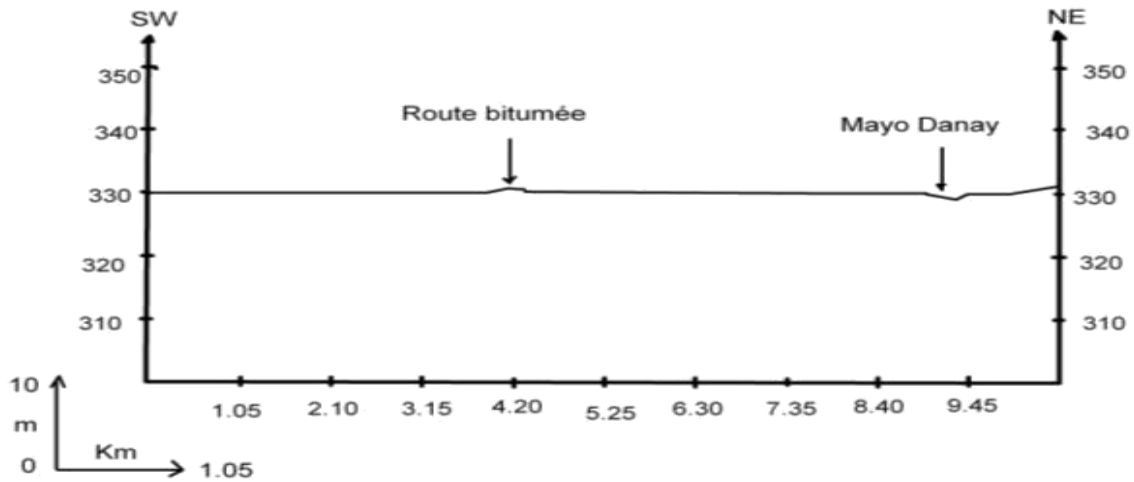
Yagoua which constitutes the research space for this contribution, is a city located between 10°20' and 11°35' north latitude and 14°55 and 15°10' East longitude. This administratively is limited to the north by the village Hatimi, to the south by those of Yeleona and Djafigayel, to the east by the river Logone and to the west by Danay-Vonrgolla and Guirif. From 37,867 persons to the RGHP of 2005, the urban population of Yagoua can be estimated at about 42,317 inhabitants in 2012 (POS, 2012). It is composed of both nationals and foreigners who occupy the different residential areas of the urban perimeter. The populations have created a belt in the city and are concentrated around the flood areas (Figure 1). Adapted by OVONO NOGO, 2017

The urban perimeter of Yagoua, as view on this figure 1, is unevenly occupied. The populations have no respect for the development standards, plus the flood zones, abandoning the exposed zones.

1.2. Topography not conducive to runoff of water

The town of Yagoua is part of the great plain that extends from the foothills of the Mandara to the southern limits of Lake Chad. It is a space that is characterized by its platitude and the almost absence of slopes (about 0.01%).

The topography of the medium presents a low elevation of the hydro-morphic soils which are difficult to promote the runoff. The watershed of the urban perimeter of Yagoua has the shape of a rectangle with a width of 6.9 kilometers and a length of 9.5 kilometers (POS, 2012). It is integrated into the large northern Cameroon lowlands, where the average altitude ranges from 300 to 350 meters. No mountain stands on the horizon (Figure 2).



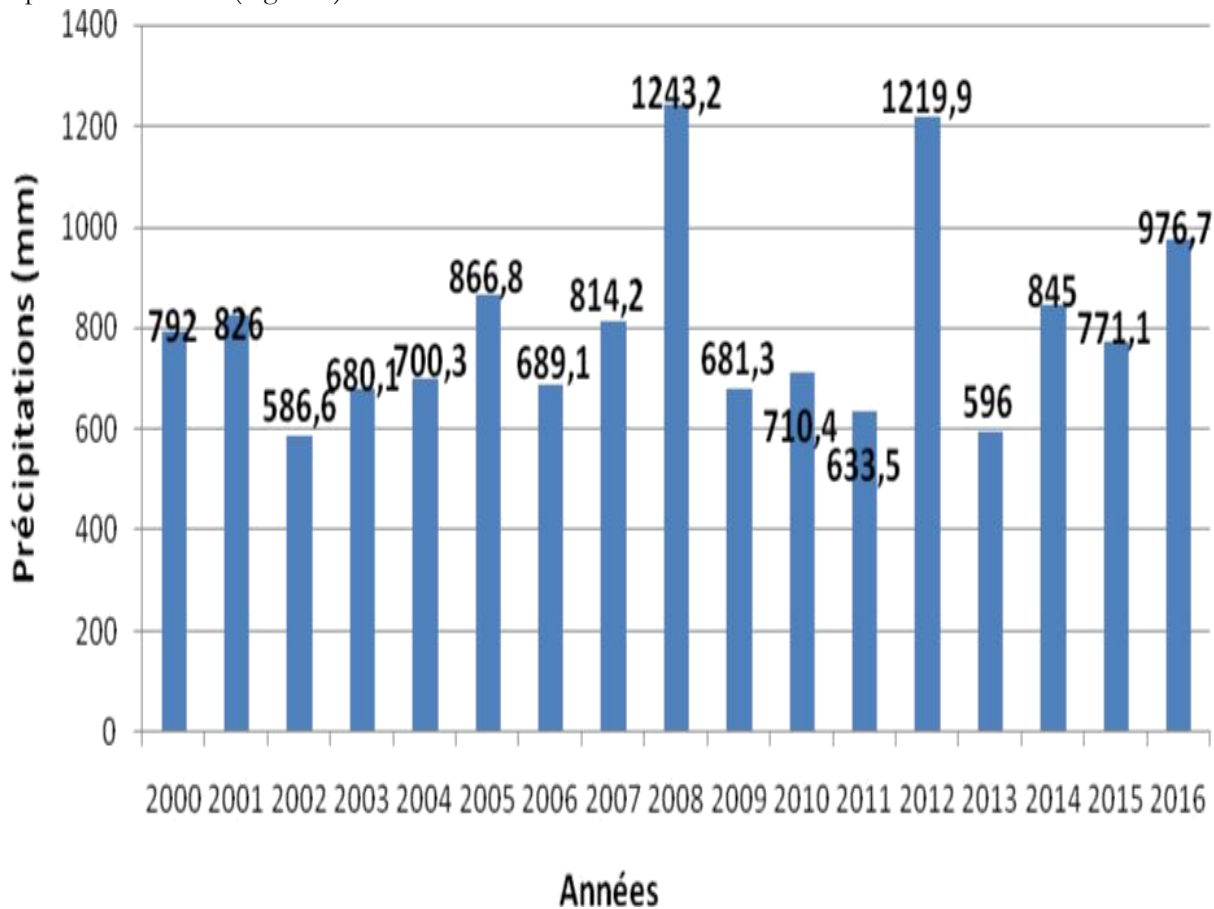
Source: Slope map of Yagoua, DD/MINDUH/MD, Adapted by Ovono Nogo, 2015 **Figure 2. SW-NE**

Topographic profile of the city of Yagoua

From the examination of the topographic profile above, it is noted that the highest elevation is 333 meters in the northeast and the lowest point is 330 meters in the southwest part. It indicates a morphology with low drop-offs with curved levels of at least 10 mm. The soil surface, at low slopes (about 0.01%), remains flat; this predicts slow runoff of water (flow rate is zero).

1.3. Annual values of precipitation sometimes contrary to the climatic characteristics of the zone

The rains are of great importance in the regularity of the floods. It is the amount of precipitation that determines the magnitude of this phenomenon (Owono, 2011). When their usual level according to the climatic characteristics of the environment is exceeded, there is a high probability of observing a flood. The surveys obtained in the meteorological services of the Mayo Danay Transport delegation give the following annual rainfall changes over the period 2000-2016 (Figure 3).



Source: Meteorological Service DD/MINTRANS/MD **Figure 3. Annual average rainfall at Yagoua (2000-2016)**

The annual precipitation values of the city of Yagoua over more than a decade show fluctuations in the climatic characteristics of the region. Generally, the annual precipitation level here rarely exceeds 750 mm. In view of Figure 3, there is an alternation between dry years and wet years, sometimes two years or three. Generally speaking, there is an increase in precipitation that reaches more than 1200 mm.

Although the climate is Sahelian, the observations must draw the attention of the decision-makers and the urban population in relation to these peaks of precipitation, because the rains are of great importance in the regularity of the floods (Mbézélé, 2011). It is the amount of precipitation that generally determines the magnitude of this phenomenon

Due to the flatness of the connects, rainwater extends over the entire surface of the soil, whether it is the banks of the Mayos or the peripheral areas. They stream until they encounter an obstacle that can trigger their ancestry. The volume rises and reaches easily in some quarters more than one meter if one refers to the Earth's surface (Photo 1).

Photo : Ovono Nogo, Yagoua, September 2012 **Photo 1. Considerable water level**

There is an occupation of the soil surface by the waters. In the foreground, the water level threatens the architectural layout of the housing window, the fence made in blocks and the lower members of the citizen present in the photo. The resulting conclusion is that this water level is almost one meter. Which is a real danger to the household.

2. Approximate management of the flood hazard

The management of a phenomenon is one of the phases of the treatment of it (Yanga, 2011). One of the first steps in this management concerns its perception or knowledge by the actors. The way it is represented influences the process of management. Floods represent a natural phenomenon (Serre, 2011). In a context where the global ecological equilibrium is becoming increasingly uncertain, particularly as a result of climate disturbances, the problem of their urban management is becoming paramount both in the cities of the developed Countries and the southern ones.

Yagoua, like any middle Cameroonian city, knows a particular urbanization. The occupation of space here is the responsibility of several actors whose behavior depends on the actions initiated. In the specific case, they are confined to situations of inertia of the public authorities and to the inciviness of the local people.

2.1. More emergency-focused institutional measures

When they do exist, the actions of the public authorities are much more initiated in the emergency. From interviews and field observations, there is a lack of elaboration of local plans for the management of the phenomenon, but above all a failure to take into account the risk of flooding in the processes of perimeter coverage in infrastructure of drainage of storm water.

2.1.1. Failure to develop control plans

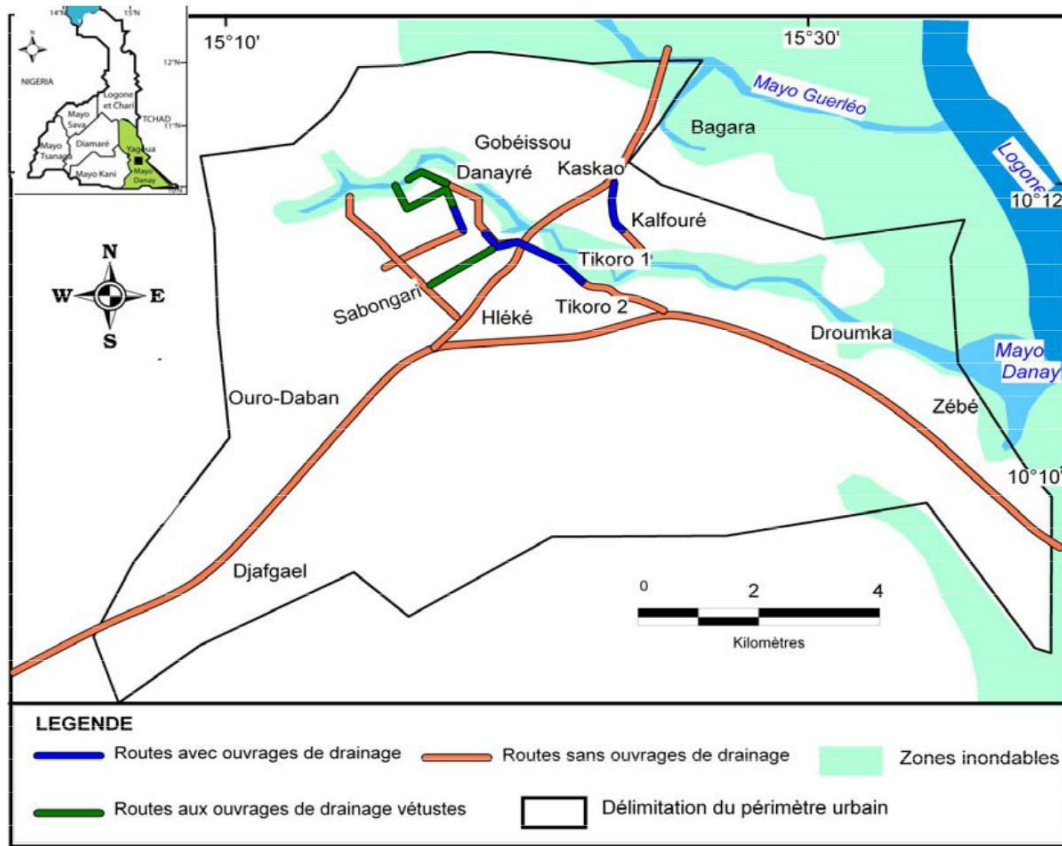
The efficient management of a disaster is a result of the implementation of long-term control plans. In the town of Yagoua, there are only emergency actions, the time of a flood and a possible distribution of the loot coming from the state coffers. A real plan to control or manage the flood phenomenon is in no way put in place. The only program that has been set up for the time being is the Emergency flood Control program (PULCI). This program, born as a result of an agreement signed between the MINEPAT on the one hand and the SEMRY on the other hand with the World Bank, for a donation of 54 billion CFA francs, well defined to take body since November 2013 to finish in 2018, has not yet reached the objectives of the headquarters and its funding partners. The actions of the PULCI are more concentrated on the rehabilitation of the dike route along the banks of the river Logoe; No initiative taken in the prevention of the catastrophe within the urban perimeter.

2.1.2. Urban roadways characterized by a low presence of drainage structures

Far from the idea that no action is being put in place of drainage works in the town of Yagoua, it is nevertheless opportune to note the spatialisation and the condition of the pavements and channels of drainage of rainwater. The results are selected on the basis of the field observations and the overlap of the archives of the technical Services of the DD/MINDUH/MD and the municipality.

The layout of the communication channels in the city of Yagoua reflects the image of an average city where pavement developments precede human installations. Sidewalks, in several neighbourhoods, are devoid of pipeline routes (Figure 3). The rainy season that most often leads to flooding makes it possible to identify the various shortcomings of these developments.

Figure 4. Limited development of drainage structures along sidewalks



Adapted by Ovono Nogo, 2017

Source: Departmental delegation of MINDUH/MD 2012

When we know that the floods in this city located in the valley of the Logone can at no time be passed to oblivion, it appears from this figure 4, that with this characteristic lack of drainage works of stormwater, the obsolete of those existing By location, the situation will be alarming every rainy season. Those of existing structures are generally not equipped with their heads with refuse-holding devices and other particles that may be deposited during the rainy season. In this logic, it is not only necessary to create only these works. At the very least, it is necessary to think about their ability to facilitate the easy flow of rainwater; A period during which the different roadways regardless of the nature of the coating, become fragile. There is a crucial problem that is undoubtedly the unsanitary situation in this urban road. Everywhere, whatever the season, the works, the case of the gutters even those newly installed become clogged quickly due to lack of maintenance by the actors (Photo 2).



Ovono Nogo, Yagoua, October 2017

Photo 2: Non-cleaning of rainwater drainage pathways

The open gutters to evacuate rainwater in some of the city's arteries, as observed in this photo 2, are not maintained even beyond the rainy season. They are abandoned and are occupied by the small vegetation; This shows the limits of the remediation of the different actors.

The cleaning here is often initiated in anticipation of the passage of a high personality. However, the concept of « clean Tuesdays », initiated by the municipality, must be the appropriate time to carry out this remedial action. All works, whatever their condition, will have to receive special attention from the hygiene services. This procedure is the only possibility that can improve the health conditions in the urban environment. It has to happen without any housekeeping or collusion.

2.2. Actions of local populations, characterized by continual indecency and an initiation of ineffective preventive and protective measures

The local population benefiting from the development activities comprises all the local communities living on the urban space. It is the most important on a numerical level and has as its main role, in terms of development, respect for urban regulation and urban order. To manage the floods, the people of the city of Yagoua adopt several techniques. This management naturally goes through the fact that they recognize each other in a way or another victim of the phenomenon. During the dry season, urban space does not cause occupation problems; People do not even care about the arrival of rains that can raise the water level. Thus, throughout the year, some isolated actions are found (table I).

Table I. Population Flood management methods

What are you doing to fight the floods?	Frequency	Percentage (%)
Laying sandbags around the house	163	58,4
Temporary moving	16	5,7
Participation in sanitation activities	7	2,5
Sub total	186	66,7
Missing system	93	33,3
Total	279	100

Source: Field surveys, 2014-2017

According to this table I, the various actions carried out by the populations of the urban perimeter of Yagoua to protect themselves against floods are so simplified. They range from the laying of sandbags all around the houses by 163 occupants, or 58.4%. This process seems to be the most used because of the availability of sand, land and the low cost of bags on the market, a means of containment to align sacks filled with sand and land along the dwellings in order to raise them. The greatest asset of this technical process is that the bags, far from stagnating the waters like the tires, rather aspire these. They eventually solidify and in time they come to constitute a veritable wall serving at times to a good drainage of rainwater. But, this strategy is proving ineffective in some neighborhoods where the volume reaches more than one meter (case of Danayre, Goboissou, Kaskao, Siratare, Zaba, Tikoro I regularly influenced by rainwater and Danay Mayo). 5.7% of them prefer to move temporarily and return only after the departure of the waters. They constitute the class of the population to propose, in the short term, a lot in the sites of relocation. Only 2.5% are involved in sanitation activities (gutter cleaning, waste cleanup); A low representation to be put to the assets of households forced to intervene in this activity for the protection of their homes.

On the whole, it is a population that thinks they are acting when they have enormous difficulties in living in their households as a result of the overflow of the waters which, as a result, invade housing units, courts and others. In fact, the administrative and individual initiatives of the local populations are not able to limit the phenomenon of flooding. The result is a variety of consequences.

3. Management of the flooding phenomenon with many constraints

The existence of cities is a very old phenomenon in Africa. They were founded in selected sites based on considerations related to the needs of colonization (Priem, 2009). From that time, investments were initiated to make the environment attractive. On a regular basis, powers are stepping to improve the framework of urban populations (Yedjié, 2013). However, when the investments initiated do not fit this logic, there are various problems. The results of the descents on the ground are for this contribution, regular problems of social order and degradation of the urban environment.

3.1. More vulnerable Population

The floods in the town of Yagoua are linked to poor planning (absence of drainage works by location, irregular maintenance of existing structures). They have a different influence on the quality of life of citizens. The most visible effects are psychological pressures, seasonal migrations, property damage, travel difficulties, insecurity and health problems. Information gathered from households during the field survey and observations reveals that the rainy season is a real psychosis for the residents of Mayo Danay and even those located beyond. The latter spend sleepless nights in times of intense rains. They constantly observe the behavior of the waters of Mayo and the level of water that stagnates on the courts. So during the day, before they go about their business, they take the trouble of storing furniture, beds, mattresses and other household utensils.

Sometimes, there are interruptions of activities (occupation of the commercial and agricultural spaces by rainwater), loss of human life following drownings in the Mayos (time pits having been dug for the search for water useful to Watering of vegetable crops in the dry season), disturbances of the school calendar, seasonal migrations that push the populations (natives of the locality), to leave the flooded areas or likely to be flooded at the beginning of the month August to return only around the month of November. This maintains the precariousness of the methods of construction characterized by the use of materials that can withstand the time of a dry season: case of dwellings situated on the bed and along the banks of the Danay Mayo: Neighborhoods Danayre, Goboissou and Tikoro I. As for the tenants, they leave the premises permanently.

The channels of communication are usually filled with water. When these waters cause flooding as was the case in 2012, and which had hit the whole city, they lead to inconveniences such as the inability for some people to move within the neighborhoods.

These situations of general psychosis and difficulties in moving within the neighbourhoods of the urban perimeter of Yagoua are exacerbated with the material damage whose reconstruction or compensation costs amount to tens of millions As highlighted by the state of expertise of those of 2012 at the beginning of June in some parts of the City (table II).

Table II. State of expertise in flood and tornado damage in June 2012

N°	Quarters	Number of households affected	Amount in FCFA
1	Doualare	17	3 901 810
2	Djibetsou	31	2 369 340
3	Siratare	13	4 395 000
4	Hleke	25	2 510 220
5	Guidanmoutou	10	5 816 535
6	Eveche	30	10 408 730
7	Tikoro I Et Ii	7	3 896 970
8	Goboissou	43	5 364 630
9	Zaba I	32	5 926 315
10	Kaskao	16	2 483 250
11	Administrative district	1	480 000
12	Mouka	1	180 000
13	Foumarkamna	1	175 840
14	Mamina	25	5 614 130
15	Vormounoun	1	442 500
16	Dina-Massa	3	1 192 980
17	Bagara	8	4 518 365
18	Danay	28	4 439 304
19	Sabongari	15	3 190 285
TOTAL		307	65 306 199

Source: Prefectural Order No. 045/AP/K25/UPS of 21 June 2012 14

Table II shows that the cost of the damage is enormous. But the month of June is just the beginning of the rainy season. An analysis of this order still notes that some indicators are at the root of this high cost damage. These are the types of housing that these households occupy. A description made of the houses, shows that they are in the whole in clay, semi hard, roof sometimes wavy, but much more thatched, unsmoothed soils. This situation is analogous to that experienced or still experiencing many neighbourhoods in some major cities in Cameroon; Brickyard, Mokolo downstairs and Tsinga Elobi in Yaounde, Mabanda in Douala, located in the swampy shoals, results obtained by Tchuigoua (2009) and Ahonne Ndema (2011).

3.2. Perpetual degradation of the urban environment

The soil characteristics of this locality present on the superficial part a sandy and sometimes clayey rock in some places. The urban environment of the city of Yagoua, like most of those located in the valley of the Logone, knows many problems on a daily basis, in times of rainfall;

Constraints linked to the physical foundations of the environment and especially in the context of this contribution, to the bad planning. The shortcomings observed in the processes of installation of drainage structures, their maintenance, develop precariousness; Similar case evoked by (Tchuigoua, 2009) in the districts of Tsinga and Mokolo Elobi in the arrondissement of Yaoundé II. For example, in most cases, the quality of the equipment used for construction, the rehabilitation of certain roadways, the degree of levelling and cantonnage, do not predispose them to withstand the waters.

Rainwater stagnates on what is described as potholes, areas of low slopes; And when they can stream, they cause erosion. When the water stagnates and is associated with the anarchic deposition of domestic waste, the soil pollutes after fermentation, and it follows an increased development of microorganisms and other intermediate derivatives. To this is added a biochemical activity that leads to the alteration of the rock with neoformation of a new layer that resists at the beginning of the dry season. This situation confirms the opinions supported by Najem Dhaher (2011) That poor planning is creating vulnerabilities in the Sidi Hcine Essijoumi City in Tunisia; of Baska Toussia and al., (2017), reporting on the spatial and sanitary challenges associated with the development of the town of Maroua.

4. Suggestions for efficient management of the flood hazard

Flooding is actually the problem of urban planning. In the Face of the phenomenon, the various arrangements involved must be the instruments of prevention (Sankeu, 1999). They have an impact on the living environment of urban populations at any rainy season and beyond. The flood phenomenon persists and is increasing over the years in the neighbourhoods of the town of Yagoua. It is therefore necessary to sit down a sustainable planning on completely at risk environments.

4.1. Strengthening of urban legislation

It is a lesser measure, to redefine the regulatory framework both administratively and legally. It is therefore important to create in the short term and to make the organizations involved in flood management work in the long term; Because the missions of the management body set up for the time being (the PULCI) are more oriented towards the rehabilitation of the dike along the Logone River, outside the urban perimeter. It is necessary to strengthen coordination within the key administrations in charge of the state matters (Division and sub-division, municipality of Yagoua, the departmental delegations of MINDUH, MINDAFC, MINTP) of the Mayo Danay.

The regular presence of a flood and the damage it will have to be a means of decision-making and the application of the texts regulating the occupation and organization of the urban space. Also important is the application of the decision of the municipal authority establishing the Tuesday day "clean Tuesday" in the area of sanitation, an opportune time to think about the introduction of the health and hygiene tax whose incomes will be able to improve the hygiene service (recruitment of staff, purchase of rolling stock and maintenance). Similarly, the objectives of civil protection should be made effective, a flood management fund could be created that could help to resettle very vulnerable households by paying attention to the duration of the formal notice.

It would also be appropriate to consider emergency remediation plans (PAU) in the event that déguerpies populations return to flooded sites.

4.2. Regular awareness of the urban population, implementation of more efficient technology and technical actions

It is appropriate, in any attempt to prevent and manage the flood phenomenon, to promote social dialogue. People regularly accuse the administration of being away from their problems, because the different strategies of the local authorities are only urgent actions. The purpose of this procedure is to raise awareness of the risk, to focus on causes, demonstrations and to indicate the measures to be followed in the event of flooding and how to prevent the phenomenon. In order for the city of Yagoua to be more attractive and easily accessible as some of the world's major cities are also regularly flooded, interest must be focused on the technological aspect with the contribution of remote sensing and on the Technical. A database must be put in place to prevent and manage the various problems of the city, a fine mapping of flood-prone areas or likely to be affected by flooding.

Also, it is sensible in the logic of efficient construction, to think about the sustainable establishment of certain works which, more, are those favoring, in the context of the management of the flood phenomenon, the flow of rainwater and streams.

The technical suggestion here is to multiply the drainage works of storm water (gutters, nozzles, dikes); To resize them, to clean them regularly and especially to initiate certain work on the bed and banks of the Danay Mayo (nanification, weeding and regular cleaning).

Conclusion

Urban flooding is often spectacular, dramatic and costly natural disasters (Melataguaia, 2011). When they happen, they go against a pleasant way of life for the people, because they are an aggravating factor in poverty.

The main aggravating factors are: rapid and wild urbanization, the incomplete drainage system, the reduction of the capacity of collectors and the uncontrolled installation of populations in risk areas. Suffering from a lack of sanitation with irregularities observed on the maintenance of the roads, added to it a laxity characterized by the municipal authorities and the inciviness of the populations, the city of Yagoua presents a picture that leaves no Doubts about possible flooding. The policies involved in dealing with this water disaster have limitations and remain modeled on urgency. This expose both the natural environment and the populations that live there to a certain precariousness. The recommendations suggest the strengthening of hygiene and sanitation measures; The increase of the capacity of the technical services of the municipality, of the DD/MINDUH/MD, the strict application of the legislation through the rigorous observance of the health Day which should be a moment of collective participation in Drainage of drains for a more attractive, healthy city, a guarantee of the well-being of the people.

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