

PLANNING DIMENSIONS OF FLOOD RISKS MANAGEMENT IN ALGERIA'S URBAN AREAS.

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Abstract: *This paper addresses a very important topic at the moment, it is the Planning mechanisms to manage inundation risks in urban areas, through a planning vision that balances need with available means, according to the planning scientific dimensions and foundations and based on natural variables and socio-economic. As natural variables constitute the basic basis for receiving and absorbing the urban project While socio-economic variables represent the actives elements and activated of the space operations. They must therefore be adapted to natural variables, especially environmental variables, in order to avoid many of the damage caused by the abuse of these elements, Identifying the mechanisms necessary to activate the work of urban schemes in the management of natural risks, particularly the risk of flood, In addition to a legal approach aimed at tracking the various areas of intervention of the Reconstruction Act and the inundation Risk Prevention Act and the various executive decrees attached thereto.*

Keywords: Risk, Environment, Urbanization, Planning, Management.

Introduction

Natural medium constitutes the basic basis for receiving and absorbing various urban projects of different characteristics, components and sizes, this element occupies a large proportion of the earth's surface and this is because of man's urgent need for residential functionality first. Other jobs associated with housing are services, trade, industry, tourism and worship, all of these elements need careful scientific study of natural circles in order to avoid positions that pose a danger to humans. And all the elements that will be signed in these places, and it must define and draw a planning vision that balances the needs and the means available within the reality of a pension and predetermined horizons This vision can be reflected in the regional and urban plans prepared in accordance with the dimensions and scientific bases of planning and based on the space situation and the natural and human resources available. Through the spirit of collective action and popular participation in its human concept, it is basically based on the fact that development and development plans are not things that can be imported, given the different spatial characteristics, human conditions and political and economic situations among human entities across the globe, Every society must therefore identify development strategies and policies

appropriate to its circumstances and its economic, social, cultural and religious realities. Similar to the cities of the world's nations, some Algerian cities in the last 30 years have experienced severe inundations with significant material and human losses, as in the case of the Beb al-Eoued inundations 2001, Ghardia in 2008, and Beni Suleiman in 2021. It was therefore necessary to reconsider ways of preparing development plans and urban programmes commensurate with the natural and socio-economic variables of the national territory especially related to the inclusion of environmental dimensions and principles of sustainable development in the stages of the preparation of urban plans, based on a protective scheme for all gains, especially in relation to the management of natural risks, Above all the floods that are the focus of this study because this is one of the most widespread types of natural disasters in the world In Algeria, especially because of its direct association with the topographical nature of the geographical regions and the prevailing climate changes, especially those that fall within the exceptional situations that many rapporteurs and even planners and specialists in this field overlook, this results in major disasters.

Hence the problem of the subject matter is highlighted as one of the concerns that concern the minds of specialists, politicians and marchers in search of a planning mechanism that allows the management of the risk inundations, especially in urban settings that know a large population density and rapid urbanization, what requires addressing and special programme within clear and comprehensive legal frameworks that are essentially part of the country's strategic axe. This is what we see through Act n°.04/20 of 24 December 2004 on the prevention of major risks and the management of natural disasters within the framework of sustainable development (*Gazette 2004*)¹. which aims to identify actions and rules aimed at reducing human and property susceptibility to natural and technological risks and work on the establishment of legal arrangements and measures to ensure the optimal conditions of information, help, subsidy, security, assistance and the introduction of additional and specialized means, down to cities that coexist with this danger, but the law still needs technical effectiveness, and here comes to mind how are the mechanisms for including the management of inundation risks in the urban plans?

Through this research problem associated with the importance of taking into account aspects related to the management of inundation risks, on the one hand, and on the other, how to include a mechanism in physical schemes that allows the management and mitigation of disasters related to such risks, we have therefore attempted to build two basic hypotheses that have been contextualized as follows:

- Taking into account the flood risks management aspects of regional and local urban programmes would reduce the scale of disasters.
- Include an effective preventive mechanism in the country's physical schemes that would address the problem of floods or mitigate them to minimal levels.

Research methodology

In order to confirm the previous two hypotheses and answer the problem, we have tried to combine several curricula in this study, including descriptive, historical and analytical, the latter allows for the identification of the necessary mechanisms to activate the work of urban schemes in the field of the management of natural risks, particularly the risk of inundations, In addition to

a legal approach aimed at tracking the various fields of intervention of the Reconstruction Act and the inundation risk Prevention Act and the various executive decrees attached thereto.

1- Urban planning within the environmental perspective

The idea of planning urban agglomerations has previously been based on the traditional theory, which is based mainly on defining the overall land use plan in the project area. Inclusion in physical schemes based on legal reference, political and social considerations and preconceived designs that often neglect the environmental dimension. Therefore, traditional planning theory considers reconstruction as a mere planning and design process. Implementation of a number of housing, facilities and services projects at predetermined stages of time in the region's capital master plan, this theory has rendered incapable of harmonizing and balancing human settlement with economic activity, on the one hand, between economic and social activity and the environmental components of the natural communities on which investment projects of all kinds are based and their environmental impacts, therefore, today all actors, especially specialists and rapporteurs, have to pay serious and effective attention to the natural elements of geographical and climatic medium within a future planning outlook based on identifying the most important interactions that arise between the natural environment and the constructive environment (Ocean Made) social environment and work to identify impacts and study the feasibility of projects. It is understood that the term "environment" is defined as "the physical, chemical and biological medium surrounding a living organism" (Saadah 2001)². Architects define the environment as "the final picture of the perceived visual medium of a specific place at a specified time, this medium is characterized by a special natural environment, homogeneous features and relative adaptation between the elements of the place itself and other natural factors of man-made influence the place" (Saadah 2001)³. From the foregoing it is clear that the urban environment has natural dimensions associated with the external environment, and artificial dimensions consisting mainly of spatial elements made. These dimensions were the fundamental basis for the emergence of what is known as environmental or sustainable urban planning, which seeks to give greater attention to the climatic, environmental and local natural characteristics of the region in all its human and economic contents so as to ensure optimal and beneficial utilization of available resources and potential, this trend has been significantly increased globally, given the significant degradation of the natural environment and the current of earth at the moment.

A-Elements of urban sustainability: Natural and constructive environments are an integrated unit, human-environment relations and mutual, retrospective or regressive interactions resulting from such interactions represent a complex network, Man is a unique creature with the potential to exist and develop a better position for his life and for his generations beyond him if he acts rationally and faithfully (Sabarini 1979)⁴. Owing to the lack of space for a detailed review of all the elements, we have tried to provide them briefly as follows:

- **Climatic elements:** Mainly heat, fall, wind and atmospheric pressure, both heat and fall are the most important elements that serve to achieve sustainability by adjusting and designing the urban project from temperature changes and daily and quarterly falls.

- **Topographical elements:** The topographical characteristics of the place vary. There are low, high, simplified and sloping places, which gives the space diverse views that form the basis of an expected human settlement that changes its condition, shape, characteristics and function, this element must therefore be taken into account in the preparation of the urban plan through the adoption of the listing rule and the appropriate preparation method to achieve a harmonious topographic and urban space.
 - **Urban elements:** they are many and branching, including density or stacking so that this element allows for better exploitation of the land and all elements associated with the urban project of different energy and networks, the second element is sustainable corridors that depend on foot mobility or the use of environmental public means where necessary, third place is just as important as the previous two, the Biophilia. It is based on man's commitment to protecting the natural environment and living systems within the principle of design with nature there are other elements related to the built framework such as high-performance buildings through the integration of materials, ecosystems and clean energies. This is called sustainable urban formation. Williams believes this composition is based on three key elements: connectivity, convergence and job integration (*Williams 2000*)⁵ while Barton identified a set of necessary criteria for sustainable urban formation, mainly in the environmental design of residential adjacent, urban formation around clean and effective energy, street network planning, energy and water efficiency (*Hugh 1996*)⁶.
 - **Social elements:** are mainly social behaviour and collective awareness of the environment and the surrounding in which we live. It is preferable to adopt a participatory perspective in the preparation of urban plans and programmes so that citizens are directly familiar with the project and have the opportunity to contribute to the development of ideas and participate in their preservation.
 - **Economic elements:** essentially two key elements: production and consumption, where these elements should be measure and managed in a manner that allows for the conservation and good use of natural resources, on the one hand, and on the other hand, the rationalization of consumption to reduce pollution and its damage as well as to increase the effectiveness of the waste recycling mechanism, especially solid ones, which results in significant risks, notably optical pollution and inundations.
- B- Urban Plan:** Many workers in the field of urban planning have many concepts about the plan and the urban project, including those who believe that the plan is more comprehensive in terms of content and longer in terms of duration, the project is more detailed, shorter and softer, as it offers the possibility of change and adjustment in time and space. The second section considers that urban schemes are nothing more than a mechanical and formal process based on simulation and imitation Its main objective is not so much to produce distinct and appropriate schemes as to achieve material objectives by specialized institutions and offices where the preventive dimensions and structured planning measures of the physical process are absent.

2- Flood risks

Inundations are one of the most common natural dangers in all countries of the world because of their significant link to precipitation and topography, the first is considered difficult to rationalization, and the second is the topographic factor, which is a natural imperative. The first is considered difficult to control, and the second is the topographic factor, which is a natural inevitability, consideration must be given to the situation in which it is located and choose what is most suitable for stability and localization, however, it was contrary to the rule where man deliberately occupied the topographical positions allocated to the flows, the estuaries' areas, which increased the risk and compounded the material and human losses.

The inundations in Algeria do not occur on a regular basis owing to the volatile climate in the north, the sudden rains in the southern regions with poor planning and citizens' tolerance, this has become a concern for the competent authorities and those interested in the management of the space, especially the urban area, owing to the high population and housing density, Many cities are located on or near the banks of the valleys, and some of them have even taken the valleys beds as their preferred place. Thus, the magnitude of the losses and damage caused by the inundations has increased depending on their forms, perhaps the most in Algeria those associated with the valleys and deluge rains of major Sahara (Desert). The number of buildings threatened was about 97,609 and 46 neighbourhoods close to the danger zones, Municipalities and regions classified under very dangerous districts have reached 46 areas, all located in the inundation-prone valley bed (*Abdessalem 2017*)⁷.

2.1- Causes of flood: Flood is defined as a hydrological phenomenon caused by high water levels in the watercourse, as a result of large amounts of rainfall exceeding the valley's discharge capacity. leading to high water levels and tyranny and thus inundating areas adjacent to the watercourse (*Chikouch 2008*)⁸.

A- Natural causes: This type of reason is a natural inevitability that is essentially linked to the element of rain that man has no income and does not rationalization, but is made by God Almighty who Says In An Airtight Download: «Indeed, Allah [alone] has knowledge of the hour and sends down the rain...»(*Luqman*)⁹, God Almighty said: « And it is Allah who sends the winds, and they stir the clouds, and we drive them to a dead land and give life thereby to the earth after its lifelessness. Thus is the resurrection»(*Faatir*)¹⁰, As the Almighty said: «And it is he who sends the winds as good tidings before his mercy until, when they have carried heavy rainclouds, we drive them to a dead land and we send down rain therein and bring forth thereby]some[of all the fruits. Thus will we bring forth the dead; perhaps you may be reminded»(*Al-A'raaf*)¹¹, So many verses on this subject, but God Almighty has not prevented man from taking measures and working for reasons, and looking for ways to avoid damages caused by large falls, especially in rainy seasons, Through the creation of its natural medium, the construction of its housing and the construction of its roads, and the preservation of natural environmental balances, which are one of the most important preventive measures to spare humans many natural disasters.

The second element relates to the topographical nature of the earth, his aspect must therefore be taken into account when preparing land-use schemes, especially those for urban use. With a careful study of waterlogging areas, which sometimes requires the adoption of historical evidence

through field forms from the memory of the population, "historical memory contributes to enriching historical information whatever this memory looks like, it re-records the past (*Davoine 2004*)¹². This methodology also allows for deep knowledge of the occurrence and emergence of climatic phenomena, reflecting the raw data on the level of water and pit elevation, which allows the presentation of phenomena and foreseeable risks, and the assessment and assessment of frequency levels for every hundred years and more (*Dupont 2009*)¹³.

b- Human causes: Mainly associated with population growth and large migration towards urban areas, which increases population and housing density, including the indiscriminate use of the natural area and occupation of flood-prone places, especially the valleys' family and low and concave areas.

c- Physical Causes: One of the most important is poor planning through the neglect of the risks scheme when preparing urban schemes. The second is the proliferation of indiscriminate and spontaneous construction, which fails to meet planning standards and contravenes physical laws, which makes many of its situated in riskers areas, thereby aggravating the risk, including foreseeable human losses.

2.2- Flood Types:

A- Watercourse inundations: This type of inundating is the most widespread in Algeria and is mainly associated with the amount of fall, including the size of the run, which in some areas exceeds its normal limit and exceeds the valley bed, to sweep through low-lying areas and slopes along the stream, causing significant damage, especially in the presence of many dwellings.

b- Dams inundation: which poses a significant risk to the population and housing, especially in urban areas, where the level of the dam has risen owing to an increase in expected drops or a lack of technical standards at completion, with increased water pressure on the region's level resulting in water dislocation and overrun in neighbouring areas.

c- Surface Flood in Urban areas: Urban runoff is a major cause of urban inundating, this inundating of land or property in a physical environment due to rainfall that exceeds drainage systems' ability to drain, large falls in urban areas, especially those with high residential density, can lead to flooding due to the low water absorption of the land. This is mainly due to the presence of many absorption inhibitions, such as paved roads, cement installations and the saturation of the absorptive capacity of the special drainage systems for the latter's rainwater drainage, which is virtually non-existent in the urban areas of Algeria, where most drainage systems are shared, this increases saturation especially with the accumulation of solids resulting from household, industrial and commercial uses. This often leads to flood and inundating in many urban areas, with rainwater flows in urban areas peaking at a much faster time than in natural areas, resulting in the risk and speed of flood (*AbdelRasheed January 2023*)¹⁴.

d- Drastic Flood: occurring in cases where the amounts of fall are large exceeding the capacity of assembly basins, which increases the volume of flows that in turn lead to the formation of a large runoff carrying solid materials such as sand and gravel of various sizes, with other obstacles encountered and sometimes severe declines, this ultimately leads to inundating of areas adjacent to the assembly basin. Previous factors lead to the existence of so-called serial dangers in cities,

this means that the underlying risk is followed by a series of other risks such as heavy rain inundating that pollutes the water supply, landslides that destroy homes and infrastructure, disrupting transportation systems, blocking roads and halting services (*Un-Habitat 2011*)¹⁵.

E- Coastal flood: Natural phenomena mainly related to the tidal phenomenon and storms leading to a significant rise in sea waves accompanied by large rainstorms, causing many flooding in coastal areas, especially low-lying ones.

2.3- Flood in Algeria

Owing to the narrow location of this component, we have attempted to list a sample from different regions of the homeland for a specified period of time from 1994-2018, as shown in the following table 1:

Tab.1- The most serious inundation in Algeria between 1994-2018.

Dates	Counties	Losses
23-09-1994	Bordj Bouariridj	16 victims
28-10-1995	al-Aghwat	40 victims
10-11-2001	Algeria (Beb-Eloued)	More than 900 victims and missing
14-04-2004	Adrar	03 victims, 500 homeless families and 700 demolished dwellings
01-10-2008	Ghardaïa	43 victims, 4 missing and 86 injured
08-10-2008	Bachar	13 victims
01-10-2011	al-Bayedh	12 victims, including a sinking element
22-02-2012	al-Taraf	03 Victims and Significant Material Losses
19-09-2018	Constantine	02 victims and 03 injured

Source: From the achievement of researchers.

Through Table (01) above the extent of the losses caused by the inundations, especially by humanity, is evident from the fact that the risk is significant. A total of 1,032 victims were the result of inundations resulting from a significant increase in the amount of fall in periods of time, especially the flooding of the valley door, which left 900 victims alone. From the localities of the inundation sites, we have reached a link for two main reasons:

- **First cause:** Beyond the scope of man and related to the quantities of fall and its duration, which is the command of God Almighty who lowers the rains as much as He wishes and how He said the Almighty: «It is Allah sends forth the winds, so that they raise up the clouds, and we drive them to a land that is dead and revive the earth therewith after its death: even so (will be) the resurrection» (*Faatir*)¹⁶. The Almighty also said: « Allah is he who sends the winds. They stir up clouds, then he spreads them in the sky as he wills. And he breaks them apart. Then you see raindrops issuing from their midst. Then, when he makes it fall upon whom he wills of his servants then they become cheerful»(*A'Room*)¹⁷.
- **Second cause:** It is a human cause related to man's industry of his space and its preparation and use from its topographic, geological and climatic characteristics, and therefore he was obliged to take the necessary measures relating to the prevention and protection against natural risks such as floods, Today's obsession with all segments of Algerian society because they firmly believe that

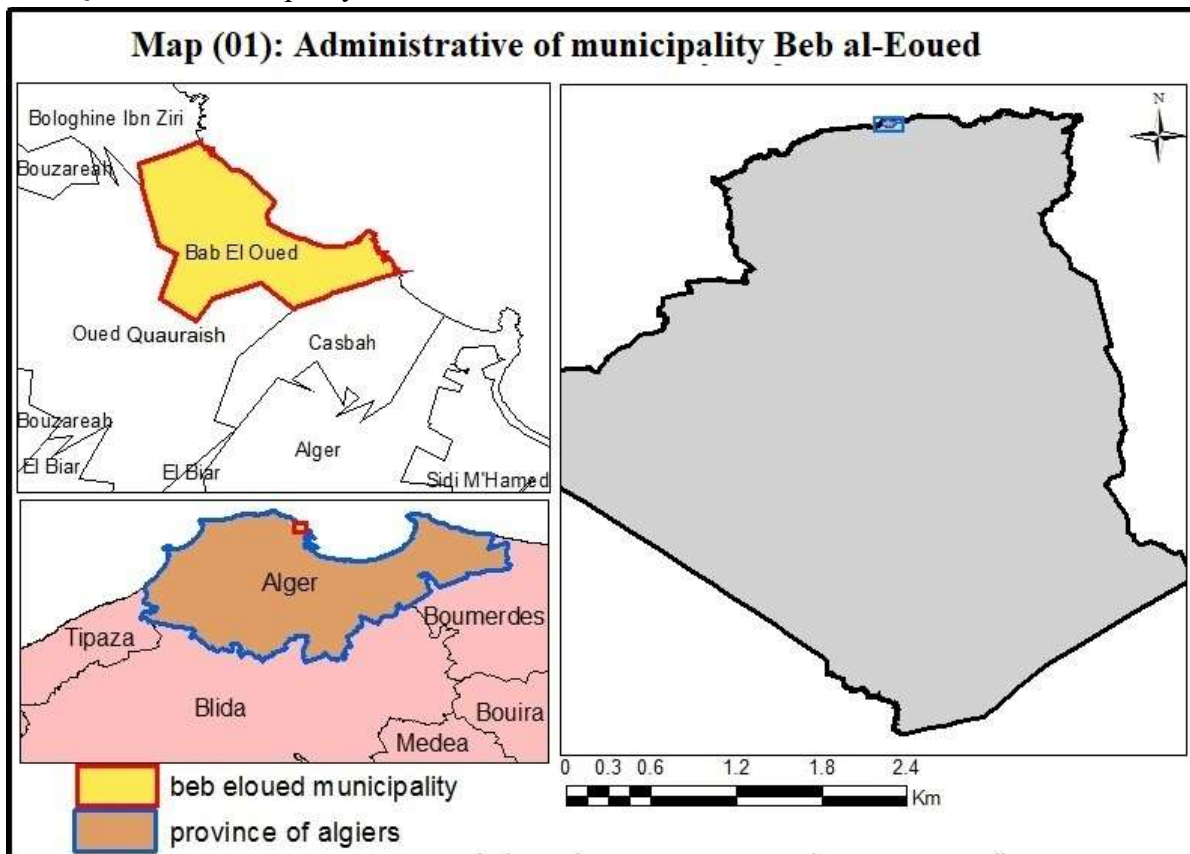
large amounts of rain will inevitably lead to floods of all kinds and degrees of damage, this is due in particular to:

- Many urban areas are located in non-reconstructive topographic locations, which are risk locations such as valleys, tributary gathering points, foothills and slopes.
- Do not adopt risk zones when preparing schemes.
- Elimination of vegetation in reconstruction processes.
- The prevalence of chaotic construction especially in estuaries, valleys and rivers and fragile areas.

2.4- Analysis study of flood Beb al-Eoued 2001.

Beb al- Eoued is a municipality of Algiers with a large population density, located within the seafront of Algiers with a population of up to 150.000 inhabitants. Known as the famous three-hour square, major inundating in 2001 led to the total submersion of the lower area, the municipality of Beb Al-Eoued falls within the following administrative boundaries (see map 01):

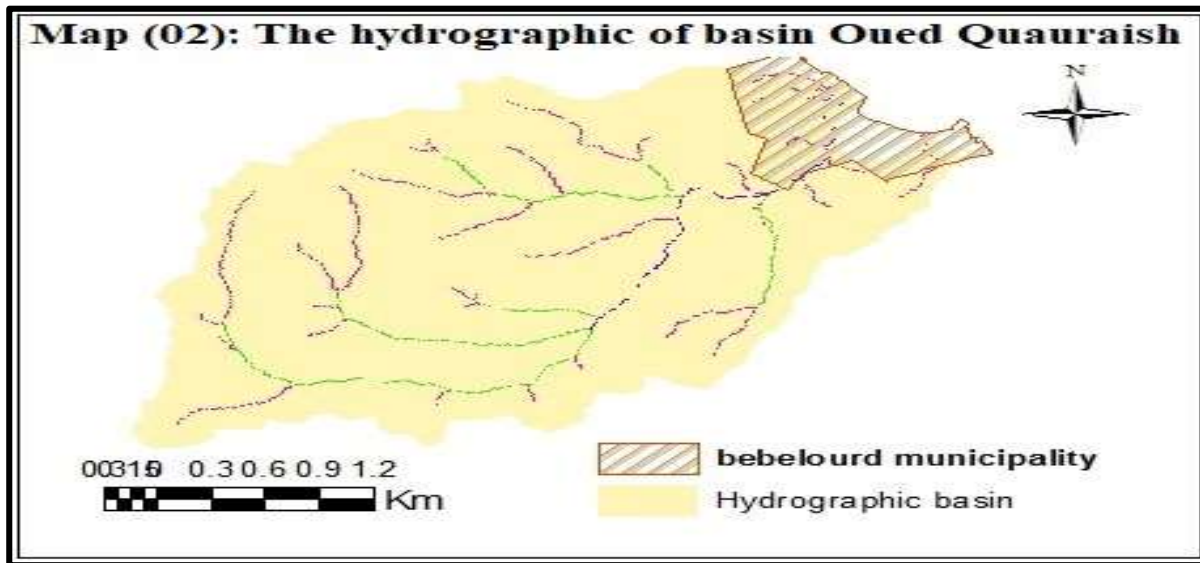
- Mediterranean Sea North.
- Municipality of Casbah from the East.
- Boulogin Municipality from the West.
- Al-Abyar Municipality from the South.
- Oued Quaurish Municipality to the South West.



Source: prepared by researchers based on [http:// data humdata .org/dataset/cod-ab-dza?](http://data.humdata.org/dataset/cod-ab-dza?)

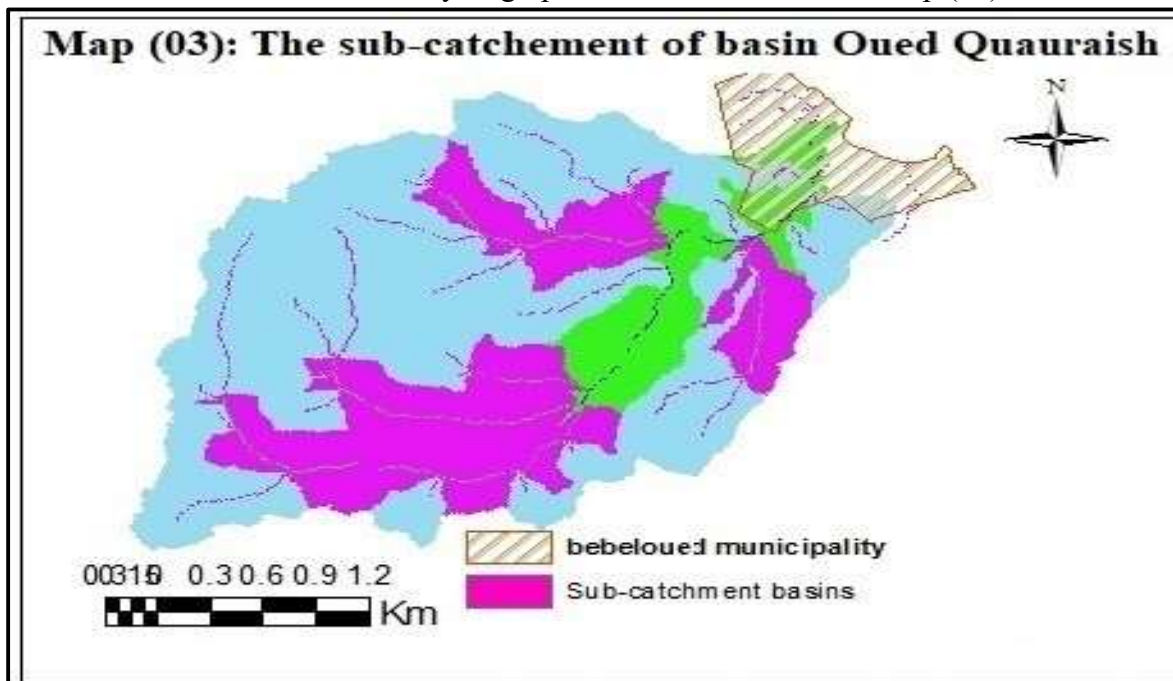
2.4.1- Geographical location of the assembly basin Oued Quauraish

Lavad the assembly basin of Quaurish valley Covers up area to 9,28 km² with an estimated perimeter of 18.48 km The municipalities of Bouzrehaa, Wad Quaurish and Beb Al-Wad are all extended, this basin also features slopes ranging from 0 to 48° averaging 6.92°. Based on the site map is clear the Viadan area is located at the bottom of the basin, which exacerbates the damage as shown in the Map (02).



Source: prepared by researchers based on <https://search.asf.alaska.edu>.

The basin is divided into sub-hydrographic units as shown in the Map (03).



Source: prepared by researchers based on <https://search.asf.alaska.edu>.

•North and East: Mediterranean Sea.

- Western: Scotto Nadal sub-basins, Steel Road, Free Fallon, Sidi Mujber, El Pranis, and Jubert Quarry.
- From the southern side: sub-assembly basin Oued Bir Tararyya.

2.4.2- Climate characteristics and risk map

The study area is within the Mediterranean's semi-humid climate and features two seasons, one cold and wet in winter, the other dry and hot in summer, Annual precipitation amounts to 650 mm per year, while sometimes exceeding 1000 mm in some months such as October, February, Mars and Avril. The region also knows of sometimes exceptional amounts of fall, as occurred on November 9th and 10th, 2001, where the region recorded significant amounts of falls of 263 millimetres that were sufficient to trigger an unprecedented major flood in the Mediterranean basin during the last decades. This exception exacerbated the climate risk, causing significant human and material damage, with 781 deaths, 115 missing, and 3271 buildings recorded between demolished and partially damaged.

Tab.1- Cumulated rainfall (in mm) of 9-11 November for four station in the Great Algeria.

Height of rainfall recorded over 6 Clock periods	Bouzareeah (R ; in mm)	Bir Mourad Rays (R ; in mm)	Port of Algiers (R ; in mm)	Dar al Beida (R ; in mm)
09/11 (6 C-18 C)	0	26	26,9	21,7
09/11-10/11 (18 C-6 C)	129,2	82,9	72	8,1
10/11 (6 C-18 C)	132,4	50	109	1,4
Cumulative rainfall (mm)	261,6	158,9	207,9	31,2
Latitude (decimal degrees)	36,48 N	36,75 N	36,46 N	36,41 N
Longitude (decimal degrees)	03,01 E	03,05 E	03,06 E	03,13 E
Altitude of stations	354 m	140 m	8 m	25 m

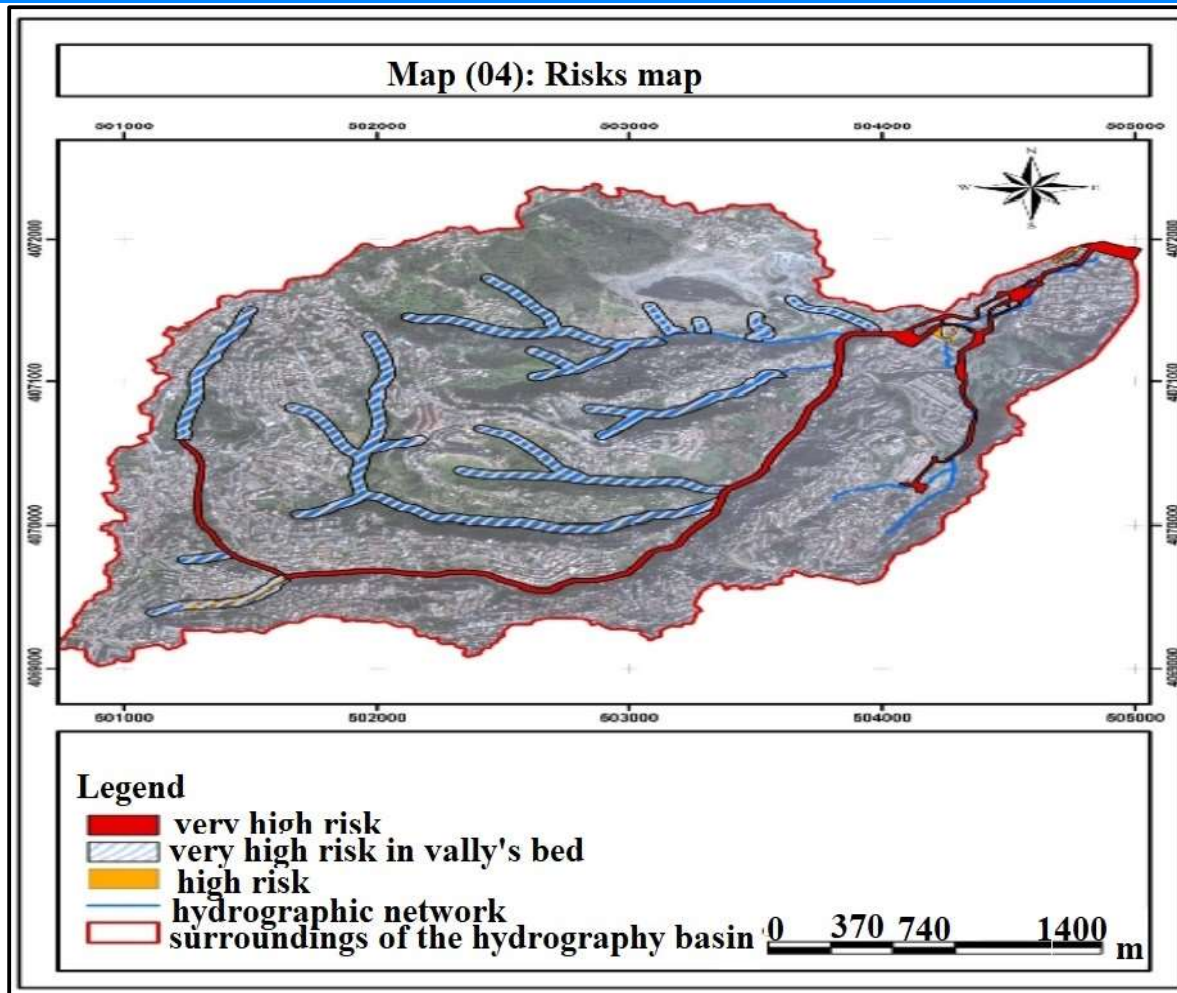
Source: <https://doi.org/10.4000/geomorphologie.9954>

This has necessitated a reconsideration of the urban plans, especially with the continuous and worrying increase in the movement of unregulated reconstruction in the south-western part of greater Algeria, where we observe gatherings of up to 100 buildings that do not have a distance of up to 200 m, thus making matters worse. To clarify the risk order, we analyzed the risk map and

discussed its content, which was prepared by determining the level of potential immersion of oblique rain over a period of time extending to 100 years Adopting the moment of the flood as a reference point for the severity of the fall known to the region, Thus, according to the map, the notifier's grades can be divided into two categories:

- **Very high risk:** It is along the main stream (Oued Maxel) and is concentrated in the lower area of the assembly basin where the Beb al-Eoued area is located, especially in the absence of vegetation and a severe slope along the main stream, which is interspersed with significant housing density.
- **Very high risk:** at the level of the sub-courses of the main stream: the bone of the risk in the sub-sewers is due to the severe decline that characterizes the upper area of the assembly basin. From Shoali to the Beb al-Eoued through Fry Fallon. Especially with a total lack of vegetation that plays a major role in absorbing fallout and reducing the speed of runoff, In addition to a significant increase in watertight operation at the foothills of the Scotto Nadal Basin and the Jubert Quarry.
- **High risk:** Given the method of distribution of buildings in the area of the lower area of the assembly basin, we note that most buildings are built in a habitual manner with the watercourse, which makes them an impregnable dam for the normal flow of water, exacerbating the situation by increasing the area of submersion.

From the foregoing, it can be said that reconstruction and occupation schemes must be reviewed through the inclusion of the planning dimensions referred to in the preceding elements, as one of the main factors through which the risk can be mitigated and potential significant losses avoided, It's also not possible Neglect of urban components The study area, which is subject to constant threat, especially with a significant increase in residential and population density, the expansion of the area of indiscriminate reconstruction within many red spots, especially in the eastern side, this exacerbates the risk of inundation and the high speed of running along streets characterized by the weak capacity of the rainwater drainage system. Also at the outlet of the assembly basin subject to high-speed water currents coming from the upper zone, this may lead to a risk of collapse, especially since the urban fabric is known as its foot. The following map (04) shows the variation in flood risk:



Source: prepared by researchers

By analyzing the map (04), the impact of the fragility of the existing gains can be identified with the map of the water immersion, which is divided into the following areas:

- **Very high risk area:** Where are the most important installations with a significant residential density in the main waterway, so the matching of these two factors results in a very high risk, as this hazardous area is about 19.60 hectares.
- **High risk area:** This area is located immediately adjacent to the first area and is directly exposed when the area of immersion increases. The way the buildings are organized further aggravates the situation. The second area is estimated to be 12.98 hectares, equivalent to 10 percent of the area of Beb al-Eloued municipality.
- **Low-risk area:** It has 19.72 hectares of low vulnerability and the likelihood of being flooded with rainwater is very low, enabling us to say that this area is safe from the threat of inundating.

3- Mechanism for incorporating the managing and administering the risks of flood into Algeria's urban plans

Urbanization is defined as "a type of direct intervention technique, whether by ideas, studies, means of implementation or achievement, to regulate and improve living conditions in human

settlements, whether at the regional or national level (*Bachir 2000*)¹⁸. Through this definition, it is clear that in order to prepare the space, mechanisms and techniques must be followed to achieve the best results. Perhaps the most important is the preparation of urban plans that respond to the current and future requirements of the citizen and take into account the natural and human specificities of the place. It also works to take great care of all dangers and include them in its priorities to reduce or mitigate the damage caused when they occur.

3.1- Incorporate flood risk management into the Scheme for Directive Amenagement and Reconstruction and land occupancy Plan

3.1.1- Concept of the Directive Plan for Amenagement and Reconstruction (DPAR)

It is a tool for the planning of the field and urban management, defines the basic guidelines for the construction of the relevant municipality or municipalities taking into account the design of the amenagement and development schemes and adjusts the reference formats for land occupancy schemes. This guideline for reconstruction and amenagement is embodied in a system accompanied by a guideline report and reference data documents. The general allocation of land on the entire territory of a municipality or group of municipalities is determined by sector:

- The expansion of residential buildings and the centralization of interests, activities and the nature and location of major installations and infrastructure.
- Identifies areas of intervention in urban tissue and areas to be protected.
- The directive plan for amenagement and reconstruction divides the area to which it relates into specific sectors as follows:
 - reconstruct sectors.
 - Sectors programmed for reconstruction.
 - Future reconstruction sectors.
 - Sectors are not reconstructable.
- **Durable sectors:** include all lands, even if they are not equipped with all the amenagements occupied by combined buildings, spaces separated between them, equipment acquisitions and activities. If not built, such as green spaces, Gardens, free spaces and urban forests are directed at servicing these combined buildings.
- **Sectors programmed for reconstruction:** Sectors for reconstruction in the short and medium term, in the 10-year horizon, according to a table of priorities set out in the directive plan for amenagement and reconstruction.
- **Future reconstruction sectors:** Land allocated for long-term reconstruction in the 20-year horizon as stipulated in directive plan for amenagement and reconstruction.
- **Non-reconstruction sectors:** Sectors where building rights can be strictly stipulated and defined and proportionate to the overall economy of the sectors' areas.

The review of this file is to:

Field assessment of the implementation of directive plan for amenagement and reconstruction, which examines the following components of this file:

- Physical framework.
- Demographic aspect.

- Built frame.
- Ecological and tourist side.
- Evaluation of the study directive plan for aménagement and reconstruction, Reconstruction and land occupancy Plan.
- Classification of land by sector.
- Prospects for development and development of municipal headquarters.

This scheme also ensures the implementation of the development directives set out in the county Planning and the implementation of all special programmes for land occupation at the municipal level, namely:

- The grassroots structure scheme of the municipality.
- Localization of public equipment.
- Identification of areas of intervention in the existing urban fabric.
- Identification of unbuilt areas.
- Establish rules and foundations that allow the completion of the land occupancy Plan while ensuring the application process.

Accordingly, the directive plan for aménagement and reconstruction, Reconstruction is the instrument for achieving and guiding the construction policy at the local level by:

- Control and rationalization of the construction process at the city and urban gatherings levels.
- Preparing and aménagement land for construction for the realization of housing policy.
- Organize the urban framework and expansion processes within what is known as sustainable development through the conservation of natural resources and urban heritage.
- Participating in the development and promotion of democratic action through a spirit of consultation among the various municipal constituent bodies.

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3.1.2- Concept of land occupancy Plan (LOP)

It is also one of the tools for urban preparation and local development, according to article 31 of Act n°.90.29 of 14 Jumada I of 1411, corresponding to 1 December 1990, "On aménagement and reconstruction. The land occupancy scheme sets out in detail, under the directives of the directive plan for aménagement and reconstruction (*Gazette 2 December 1990*)¹⁹, land use and construction rights and the most important elements underlying this scheme are:

- The specific sector, sector or area defines in detail the urban form, organization, building rights and land use.
- The minimum and maximum quantity of permitted construction crossed in square metres of the floor built outside or in cubic metres of sizes, permissible building patterns and uses shall be assigned.
- Adjusts the rules regarding the exterior of buildings.
- Identifies public space, green space and locations for public establishments and establishments of public interest, as well as the planning and features of traffic routes.
- Identifies neighbourhoods, streets, memorials, sites and areas to be protected and rehabilitated.
- Designates, protects and protects peasant land sites.

3.1.3- Assessment of flood risk management for each of Scheme for Directive Aménagement and Reconstruction and land occupancy Plan

Based on the planners' content, we tried to complete the following evaluation table (02):

Table. 2: Flood risk Assessment within Urban Planners

Components	Structural Elements	Strengths	Weaknesses
Physical Framework	<ul style="list-style-type: none"> - Preparation and aménagement of land for construction for the realization of housing policy. - Identification of non-construction areas. 	<ul style="list-style-type: none"> - Preparation and aménagement of land 	<ul style="list-style-type: none"> - Disregard for random interventions by citizens resulting in the emergence of chaotic housing clusters, often in areas prone to inundation
Built Frame	The grassroots structure scheme of the municipality. Localization of public equipment.	Reconstruction control is done by controlling the certification and licensing mechanisms for construction	Granting authority to monitor reconstruction to the mayor who is influenced by social and political practices, Make legal materials ink on special paper Article 76 bis 4
Ecological and Tourism aspect	Organize the urban framework and expansion processes within what is known as sustainable development through the conservation of natural resources and urban heritage.	The Reconstruction Act contains articles that allow for the preservation of the environment by enabling management practitioners to apply administrative control authority to ensure lasting harmony with the law by all interventions in the urban environment.	Ecological dimensions can be overlooked during the preparation of the construction and reconstruction schemes, requiring care to prepare well for these schemes by the municipal and state reconstruction dictators.

Source: prepared by researchers.

3.1.4- Inclusion of the flood risk management mechanism in the Scheme for Directive Amenagement and Reconstruction

This mechanism can be clarified by strengthening the structural elements of the planners' content and the above-mentioned evaluation table as follows:

- A- Physical framework:** The outline focused on the following physical elements:
- Preparing and amenagement land for construction for the realization of housing policy.
 - Identification of unbuilt areas.
 - Establish rules and foundations that allow the completion of the land occupancy scheme while ensuring the application process.
- B- Built Framework:** Appropriate construction forms should be selected especially in sloping areas, building materials must also be precisely defined, especially those that are suited to the region's natural conditions.
- C- Ecological and Tourism aspect:** Although the urban legislature referred to this element in general, the phrase "the organization of the urban framework and the expansion of what is known as sustainable development through the conservation of natural resources and urban inheritance" appeared but strengthening this element remains the obligation to include all elements of sustainability in the urban process, especially climate.

Conclusion

The nature of the research into flood risk management has forced us to adopt a progressively printed logic and intellectual format, combining what is legal with what is structural and urban and physical, through this research, we have drawn up various variables that address the issue of the planning dimensions of inundation risk management, especially the legal mechanisms adopted to preserve individuals and property when intervening in the field. On the other hand, an example of the risk of inundating was given, including natural and human factors in exacerbating the flood phenomenon in the city. The Beb al-Eoued area was taken as one of the flood-ridden areas in 2001, resulting in legal consequences, as reflected in Law 04/20, which carried aspects related to management and technical aspects related mainly to the situation and construction. Through new structural measures, translated into rules that intervene in the urban reconstruction process, as well as the inclusion of appropriate legal and planning dimensions at the level of all local and national preparation and reconstruction instruments, in order to develop a clear road map for all interventions in the urban space.

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