

The Major Environmental Problems in Congo Brazzaville: Case of Brazzaville

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Abstract In the world in general and sub-Saharan Africa in particular, environmental issues interest and influence more and more all the actors of society namely economic policy makers, civil society and government. Congo Brazzaville in general and Brazzaville in particular, which is also one of the cities of developing countries is faced with proven degradation environment problems whose causes are mainly from human activities, natural phenomena and socioeconomic problems. This environmental degradation threatens the health of populations both urban and rural. Drastic measures must be taken against these problems. Thus, an awareness policy and necessary measures must be developed to educate, raise awareness among people to prevent potential hazards related to this issue of environmental degradation that has become worrisome and compromises already the lives of people in the city of Brazzaville particularly.

Keywords: *environmental problems, degradation, human activities, Brazzaville*

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1. Introduction

Already in 1972, the first major world conference on the environment⁽¹⁾, issues related to climate change were at the center of the concerns of world leaders. 43 years later, this dangerous issue is becoming a growing concern, to the point that any local as well global economic decision needs to focus on the impacts it can have on the environment.

As for Brazzaville, the capital of the Republic of Congo commonly called "Brazza the green"⁽²⁾, the environmental degradation phenomenon becomes more apparent. Indeed, Brazzaville, an amazing city with streets like paths leading to villages give it a charm and a certain and obvious originality (Masson, 2012), known environmental deterioration manifested by the disastrous consequences both its people as its infrastructure and landscape that used to be green. This study focuses on the environmental problems of Brazzaville. First, we will briefly present the city of Brazzaville, and then we will list the various environmental problems undermining the said town and finally, their main causes, and some approaches of solutions to fight against this phenomenon. These are the objectives of this work.

2. Methodology

The methodology used for the realization of this article is made by combining a certain number of research techniques namely field observations and information retrieval. The literature search allowed us to consolidate the necessary information on the Brazzaville environment, which has been treated thoroughly in order to discover the truth that the documents cover. As for the field research, it allowed us to compare the oral and written information, this allowed us also to take some photographs of the urban environment of the city of Brazzaville.

3. Area of Study

Brazzaville is the capital and largest city of the Republic of the Congo also called Congo Brazzaville and is located on the Congo River.

The city was founded on 10 September 1880 on the site of a Bateké village by an Italo-French explorer, Pierre Savorgnan de Brazza, after whom the city was named. The local leader, Makoko of the Téké, signed a treaty of protection with de Brazza which subjugated his lands to the French Empire. The city was built four years later in order to become a competitor with Leopoldville (now Kinshasa) which was built by the Belgians on the other side of the river (the Democratic Republic of the Congo).

In order to distinguish between the two African countries with "Congo" in their names, the Republic of the

¹ First major global environmental conference in 1972 in Stockholm, Sweden.

² Nickname given to Brazzaville through streets like paths leading to the villages, Travel Blog, road book, photos Julien Masson.

Congo is sometimes called Congo-Brazzaville, as opposed to Congo-Kinshasa (the Democratic Republic of the Congo, known from 1971 to 1997 as Zaire, the capital of which is Kinshasa). Kinshasa lies on the southern bank of the Congo, across from Brazzaville. This is the only place in the world where two national capital cities are situated on opposite banks of a river, within sight of each other.

With a population of 1,373,382 habitants (2007), it covers an area of 110 km². Brazzaville is divided administratively into seven (7) districts: Makélékélé, Bakongo, Poto-Poto, Mougali, Ouenzé, Talangaï and Mfilou (Pripode-CG1 Report, 2005) (Figure 1). It should be noted that two new districts come to see the day that is the district number 8 Madibou and the district number 9 Djiri (Law No. 9-2011 of 17 May 2011).

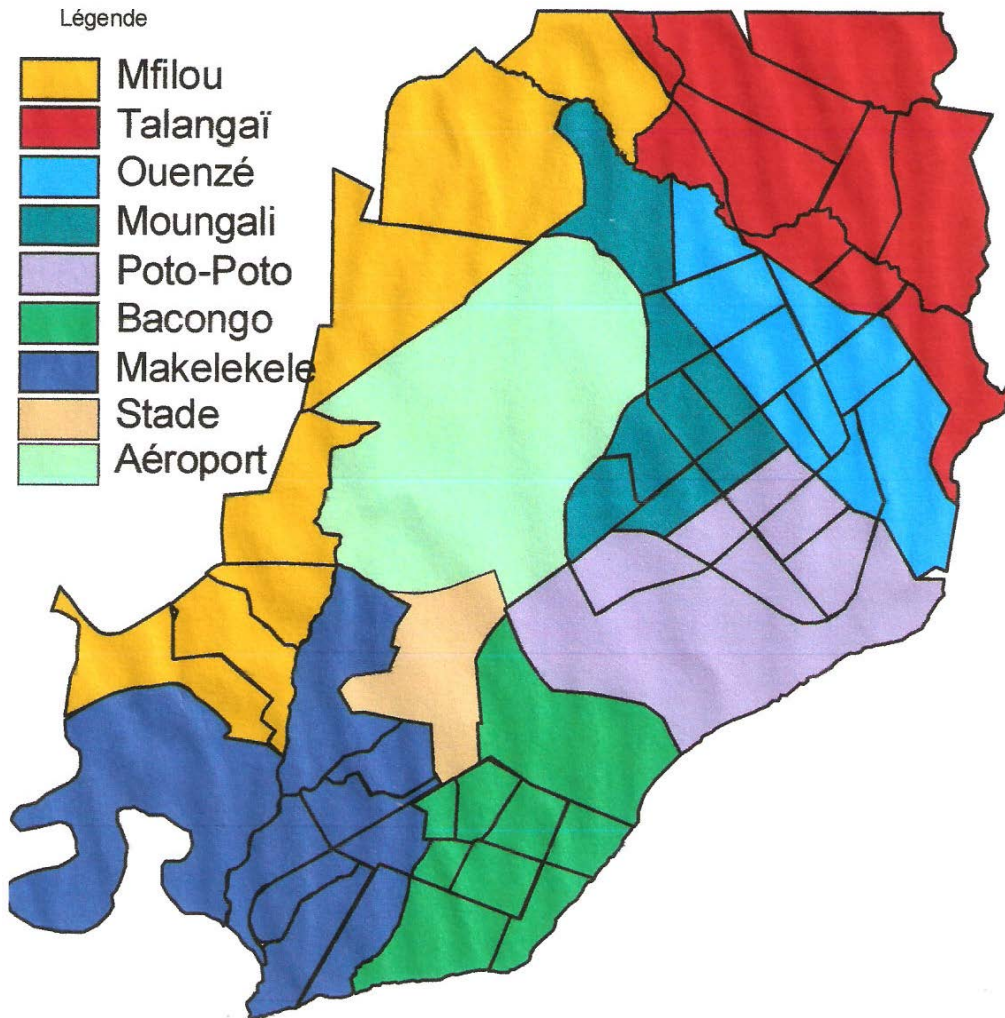


Figure 1. Districts of Brazzaville (Source: Pripode-CG1 Report, 2005)

4. Environmental Problems

First of all, a definitional approach of environmental concept will elucidate our understanding. We take for environment, "everything that surrounds us"; it is all natural and artificial elements in which human life unfolds.

In Congo, the environment management is governed by Act No. 003/91 of 24 April 1991 on the protection of the environment. The National development plan of territory (SNAT in French) also focuses on the preservation of the environment and ecosystems. Also, the Poverty Reduction Strategy Document (DSRP in French) places the sustainable management of natural resources at the heart of national priorities incorporating areas of socio-economic development to environmental issues.

Despite all this precaution, the country, particularly in its political capital, Brazzaville, the problems related to environmental degradation are becoming an increasing

concern, among them we can mention sparsely: erosion, pollution, waste, noise, water and electricity problems, transport, deforestation, depletion of natural resources, global warming...

4.1. Erosion

The country faces an ongoing erosion phenomenon that disrupts the achievement of transport infrastructure. There are generally two types of erosion: Wind erosion and erosion by water or rain erosion.

4.1.1. Wind Erosion

It is characterized by three phases: firstly, the floor is raised under the aerodynamic action of the wind, the volume of the displaced sand is proportional to the cube of the wind speed. Secondly, the transport phase, the sand forming part of the flow is carried more or less depending on the size and density of the particles. And finally, the third phase, called sedimentation phase, result from both

of the loss of power of the wind flow due to weather events related to the topography and evapotranspiration of the plant cover of the area addressed, it also depends on both the size and density of the densest and most coarse particles accumulating faster than finer and lighter particles (Diamouangana, 2011). Wind erosion is less frequent in Congo.

4.1.2. Rain Erosion

It is the most common phenomenon on the Brazzaville site. It is the object of the evils of Brazzaville's people.

Indeed, atmospheric precipitation is the causative factor of the phenomenon of erosion by water. The nature of the soil, some climate factors, slope, vegetation and man are a set of factors that influence this phenomenon. As for the erosion by water, there are four phases in the gully process by water: the drop effect, sheet erosion, rill erosion and erosion by digging (Ibid).

The city of Brazzaville undergoes fully the consequences of the torrential rains leaving at their passage astonishment and desolation (Figure 2). As shown in the picture, enormous erosions emerge, destroying homes and public infrastructures such schools and roads.



Figure 2. Landslide along a major roadway in a District in Brazzaville

The water erosion is due to anarchic housing estate, to demographics resulting in urban expansion, rural exodus, to deforestation, to the lack of storm water drainage systems, of communication on the issue of erosion, lapsing of urban development plan. Since the end of the 1970s, the rapid growth of cities (4 to 5% per year, according to ECOM 2005) was not followed by the construction of infrastructure and public facilities that would respond to the demands of urban development due to technical and financial inability of responsible services. This is what explains the current situation, which is characterized, first, by a significant lack of roads and utilities on an important part of urban spaces, and secondly, by the non-accompanying of a device performer housing production.

4.2. Water Problems

We need to replace the water that our body eliminates daily, but also to produce our food. That is why this resource deserves special attention (Tietenberg et al, 2013).

If any part of the world population is sorely lacking in fresh water, this is not the case of Congo Brazzaville in general and Brazzaville in particular. According to

estimates, fresh water represents only 2.5% (1.4 billion cubic kilometers) of the total volume of water available on the planet. Of this, less than 1% (200,000 cubic kilometers) is available for human consumption and ecosystems (Gleick, 1993).

According to Biggs et al. (2004), in Congo, global renewable resources are estimated at 832 billion cubic meters, or 268 387 cubic meters per year, placing the Congo in the category of countries with abundant water resources.

Despite this advantage, the rate of drinking water in the country is insufficient. Only 40.7% of the urban population and 14.5% of rural dwellers have access to drinking water in 2000 due to lack of modern structures. People make use of the rain waters, ponds, streams, rivers, and wells which are unprotected with all water-borne diseases (schistosomiasis, bilharzia...).

Brazzaville has a dense hydrographic network composed of the Congo River with many streams among which we can mention: Tsiémé, Mfoa, Djoué ... But unfortunately, with all that potential, water is a luxury commodity in the city. The problem of access to drinking water arises with acuity (Allessembaye, 1994). Moreover, the Minister of Mines, energy and hydraulics said in march 22nd 2007, at the opening of the meeting on the 'Decade of water', that 'the Congo suffers from a paradox: a shortage of water next to potentially abundant reserves and unsafe water in urban areas...'. In his speech, the Minister raises actually two problems: the lack of access to water and its poor quality (Ofouémé-Berton, 2010).

Several areas of the city including the outlying districts are not served in drinking water because they are away from the distribution network. Thus, to obtain water, urban residents use wells, drilling and even rainwater. For districts that have access to the distribution system, water comes out jaggedly⁽³⁾. When it comes out, they have to wait for a long time (Figure 3) to get it even if it has a color which "makes shudder"⁽⁴⁾. According to ECOM 2005, 10% of households take at least an hour to access to a source of drinking water. Usually, women and children perform this task.

Yet managing water as an economic good has been recognized as an excellent way to ensure efficient and equitable use of resources, and encourage conservation and protection at the International Conference on Water held in Dublin in 1992 (Lefebvre, 2011). In Congo, the management of this resource in particular its supply was entrusted by the National Water Distribution Company (SNDE in French) which, despite the growing number of subscribers (72,062 in 2008 and 74,097 in 2009 concerning the department of Brazzaville) that is to say the revenues generated by households, does not provide any effort to resolve this disastrous situation which becomes the daily life of citizens.

4.3. Power Problems

Nowadays, most of the industrialized countries depend on oil and natural gas for their energy needs. Globally, these resources represent 56.4% of all energy consumed (International Energy Agency, 2012).

³ Characterized by alternating good and bad times, Microsoft Encarta, 2009

⁴ Causing a feeling of fear or fright, Microsoft Encarta 2009.



Figure 3. Thread waiting for water in Brazzaville

The Congo has huge potential of hydropower, natural gas and oil, however, population's access to energy in many forms (electricity, oil and gas) is very low. According to the results of the ECOM, in urban areas, the most used lighting mode is the oil lamp (70.1%) followed by electricity (27%). In rural areas, the main lighting mode is the oil lamp at 97%. Regarding the fuel used for cooking food, it appears that 70% of the poor use firewood against 44.1% of middle-class. In Brazzaville, the two categories represent 36.3% and 17.4%, respectively.

Like water, electricity is also managed by a state company, the National Electricity Company (SNE in French). Congo has two hydroelectric dams (Moukoulou (74 MW) and Djoué (15MW)), a gas plant at Djéno (25 MW) and a thermal power plant in Pointe Noire. However the production is insufficient to cover the electricity needs of the country, therefore, the country has to import almost 60% of its electricity from the Inga dam in Democratic Republic of Congo (DRC).

The electricity problem is a headache for the Congolese in general. The electrical network dating from years, cannot serve the population living in peri-urban areas into electricity (Balkiabiya, 2008). Indeed, transportation and distribution networks are very old. Thus, the power cuts phenomenon has become routine and an integral part of Congolese's life. It should be noted that this situation continues for years and is becoming normal that no longer surprises the Congolese because, by dint of lamenting without finding satisfaction, many have developed nervous problems. Hence, aggressive behavior towards the

company's agents who, despite their bad management of the electric network are always in the lookout when it comes to unpaid bills. Faced with this situation, wood and charcoal are used as the main source of energy especially in cooking. Also, generators, solar plates, gas and oil lamps ... become fashionable.

Despite the existence of several hydroelectric dams, gas plant, and thermal power plant and recently the construction of a new hydroelectric dam, especially the dam of Imboulou⁽⁵⁾, the city of Brazzaville and Congo in general still facing the problems of electricity until this day. From the point of view of housing comfort, just 28% of Congolese households have electricity (including 27% by subscription to the National Company). Access to electricity presents a clear discrimination between poor and non-poorhouseholds.

4.4. Global Warming

Climate change is a global environmental problem that already threatens life of people around the world. The National Climatic Data Center (NOAA) shows that the global temperature rose by 0.8 degree since the beginning of the industrial era. Between 1980 and 2010, this growth was 0.6 degree and the month of november 2012 marked the 333rd consecutive month in which the temperature was higher than the average recorded for the same period in the 20th century. Also, according to International Energy Agency, the use of fossil energies has increased the level of emissions of CO₂.

⁵ New hydroelectric dam inaugurated on May 7, 2011.

In fact, since the industrial revolution, we reject huge amounts of gases that enhance the greenhouse effect. Therefore, emissions of greenhouse gases continue to rise despite the fact that the consequences could be catastrophic and irreversible on the whole of humanity. We know for example that forests contribute to the conservation of soils, climate regulation both regional and global ... (Ott-Duclaux-Monteil, 2013), but, that does not prevent forests and small forests to be overexploited all around the world.

The use of wood and charcoal as energy, common in the Brazzaville region causes the destruction of peri-urban forest ecosystems that provide climate control. Also, the explosion of population and the government urbanization policy called "accelerated Municipalisation" cause several devastating effects on the environment by the phenomenon of pollution. Statistics show that the distribution of emissions of CO₂ in 2000 was: energy Industries: 65.93%; transport: 29.78%; residential: 0.51%.

Ultimately, the effects of climate change in the Republic of Congo are mainly reflected by: (1) a general decrease in annual rainfall throughout the country, (2) a general increase of maximum temperatures of about 0, 76°C and 0, 69C for minimum temperatures and (3) a general decrease in flow streams, rivers and their tributaries. Added to this, natural disasters manifested by winds, floods, torrential rains causing erosions and landslides that cause damage to schools and hospitals and leaving many homeless.

4.5. Noise Pollution

Noise pollution is the cause of many conflicts as well as in Western cities than African cities. Despite the existence of laws regulating noise pollution in Congo Brazzaville, especially the Law number 003/91 of 23 April 1991 on the protection of the environment, which in Article 11 prohibits noise causing nuisance to neighbors or harmful to human health, Brazzaville is among the noisiest capitals in Africa. Indeed, these excessive noises come mainly from drinking places, churches (revivalist), gaudy street vendors, the honking of buses and taxis. It should also be noted, Maya-Maya airport located in bandaged areas and the railway crossing an important part of the city cause serious nuisance problems to the population. Hence the appearances of many diseases such as blood pressure, sleep disorders, overstrain, anxiety, aggressiveness....

4.6. Transports

Urban mobility in the southern countries has difficult character to understand with the northern countries' analysis repositories. Beyond the specific complexity inherent in any system of individual's mobilities, major southern cities have their own operating logic [Godard, 2002].

The road network of Congo, with about 17 300 km long, includes only 1235 km of paved roads, has deteriorated and suffers from lack of maintenance.

Transports are among the major problems faced by Congolese in general and Brazzaville's population in particular. This unpleasant situation is a major headache especially as moving from one neighborhood to another requires hours of waiting, also, you have to take two or three buses to get there. Indeed, drivers section itineraries

set by the municipal authorities, which is at the origin of the phenomenon of "short routes (demi-terrain in French)"⁽⁶⁾, phenomenon caused by traffic jams.

Very few households, whether they are poor or not, have moving means. The movement means that households have the most is the bicycle (6.2%), in semi urban areas (12%) and rural (11%) (ECOM, 2006).

The spatial growth of Brazzaville and the explosion of its population have led to an increase in demand for transport. This increase in demand, is added, roads mostly in total disrepair and poorly maintained, and collective transport in very poor condition. There are indeed in Brazzaville as in all other major cities of Congo, three different modes of transport: (1) Individuals taxis with a capacity of four places, the amount of the race varies between 1.45 and 2.72 USD; (2) Common taxis, commonly called "100-100"⁽⁷⁾, with a capacity of six, the amount of the race is 0.27 USD; (3) The public mini buses, known as "hiace" with nineteen passengers capacity, and larger public buses, commonly called "Coaster" with a capacity of thirty-one passengers, the amount of the race is fixed at 0.27 USD (Table 1) (Audard et al, 2012). This sector is managed by individuals, but it is strictly regulated by the state.

Table 1. Characteristics of modes of land public transport in Brazzaville

Modes	Type of vehicle	Seating capacity	Fare (cost of travel)
Private taxis	Toyota Corolla	4 persons	USD 1.45-2.72
Public taxis	Toyota Corolla	6 persons	USD 0.27
Public mini buses	Toyota Hiace	19 persons	USD 0.27
Larger public buses	Toyota Coaster	31 persons	USD 0.27

4.7. Waste

The increase in population leads to an increase in consumption and therefore an important work of the waste management (Nzoussi, 2014). For example, according to the UN, 90% of sewage and 70% of industrial waste from developed countries are dumped in the wild without any treatment. The volume of waste is increasing and available space to store them safely and without contaminating groundwater decreases more and more (Tietenberg and Lewis, 2013). For industrialized countries, reduce, reuse and recycle are an effective response to fight against this phenomenon affecting seriously both Western capitals that are faring as best they can than capitals of the developing countries which are most as the dumps of garbage, commercial and industrial waste ...

The Congo produces several types of waste: banal industrial waste, special industrial waste, household waste and biomedical waste. In Congo, approximately 70% of waste produced are biodegradable and 30% divided between the industrial and hospital waste. These waste mingle in the dumps (ECOM, 2006).

From "Ponton the beautiful"⁽⁸⁾ (known as Pointe-Noire) to "Brazza the green", none of the two capitals today

⁶ Phenomenon characterized by sectioning itineraries by drivers.

⁷ Nickname given to taxis generally in poor condition serving the suburbs

⁸ Nickname given to Pointe-Noire, the economic capital of Congo Brazzaville.

deserves qualifiers "beautiful" or "green" because the waste give another decoration to these cities. For example, the remarkable presence of plastic bags everywhere contributes to environmental degradation and loss of biodiversity.

Indeed, waste give another form to the city of Brazzaville. In most areas especially near markets, schools,

garbage is thrown in the streets, streams, ditches, abandoned and unoccupied places; especially as waste management is not assured by the municipality, also, spills are not controlled by the competent authorities (Figure 4). Generally there is no landfill site throughout the city that leaves room for dumps. The pickups are occasional, often at the request of the city dweller (Samba, 2007).



Figure 4. open pit waste in Brazzaville.

Now, more than 85% of the population have no more access to adequate garbage collection service (ECOM, 2006). To strive against this phenomenon that sometimes becomes unbearable because of odors, urban dwellers use all opportunities that arise to them to get rid of their waste: incineration without precaution, burial or abandonment in the immediate vicinity, vacant lots, in gutters, along the streets or rivers crossing the city, or they make calls to "pousse-pousseurs"⁽⁹⁾ for a small sum (0.18USD to 0.54USD) whom at their turn, will discharge them in illegal dumps.

4.8. Pollution

Pollution comes in many forms: air pollution (the most serious form in the capitals of the industrialized countries such as Beijing), water pollution and soil pollution (the most common form in the capitals of developing countries including Brazzaville).

The air pollution is the most famous of all type of pollution. It is caused mainly by the gases and particles released into the atmosphere by automobiles, by

incineration of garbage, the putrefaction of garbage littering the streets, industries, the use of wood and charcoal, generators ... The World Health Organization (WHO) estimates that nearly 7 million people died prematurely in 2012, one in eight people in the world, due to exposure to pollution air. The air pollution has become a major environmental risk to health in the world (Our Planet, 2014).

Pollution of soil, as we said above, is the most popular form in Brazzaville because of piles of garbage we find everywhere in the neighborhoods, the use of chemical fertilizers for agriculture, release of toxic industrial waste.

As for water pollution directly related to soil pollution, it is through the discharge of waste water from households, hospitals and industries in nature. These waters, either rejected in parcels or dumped in the streets eventually evaporate by depositing rubbish they contain (Vennetier, 1991) and they usually finish their race in the oceans via rivers.

4.9. Deforestation

Wood and charcoal provide by forest are the main sources of energy for Brazzaville's citizens especially in cooking and heating. This dependence on wood has

⁹ Individual with a wheelbarrow to transport household waste

resulted in the disappearance of small forests of the city making soils most vulnerable against degradation processes because, forests, contribute to the conservation, also in the regulation of that global and regional climate.

4.10. Depletion of Natural Resources

The forests of the Congo Basin are threatened. This forest area, the second in the world after the Amazon is the victim of illegal trade in tropical timber. This is also the case of Brazzaville's small forests which gradually disappear. Or tropical forests are the richest reservoirs of biodiversity on the planet.

5. Conclusion and Recommendations

This study, regarding environmental problems in Brazzaville has allowed us to address the environmental issue of the capital city of Congo. Erosions, the various forms of pollution, waste, noise pollution, deforestation, the depletion of resources, global warming, water and energy issues, and transportation, human activities are the main cause of these problems as well as natural phenomena, without forgetting the ineffectiveness of government policies. However, human activities in the environmental degradation processes are at the same time direct, indirect and cumulative (Diamouangana, 2011). In most developing countries, we are witnessing a race of irresponsible use of natural resources without considering the consequences it may cause on the environment. In this perspective, every economic decision had to consider the consequences beforehand it would generate on the environment.

Draconian policies must be undertaken against these phenomena. In the fight against erosion governments must fight against the uncontrolled construction on land at high risk, develop a policy of good management of rainwater, encouraging the protection and restoration of soil and finally, afforestation that is to say the hardest ground cover, densest and most durable on the slopes summits to avoid tearing the high slopes. Policies of creation of drilling for drinking water in rural areas must be implemented; programmes of infrastructure development of drinking water supply and adequate sanitation systems must be also established.

To fight against the emission of greenhouse gases, it would decide the accelerated elimination of old vehicles, reducing the prominence given to the private car, giving more space for public transport. Encourage the production and consumption of recyclable or biodegradable products. Reduce, reuse and recycle waste while creating good conditions of storage. Improving citizens' lives by allowing them access to basic services such as health, education, water, transport...actively fighting against poverty by creating jobs.

Above all, public authorities at the local level, regional as global, non-governmental organizations (NGOs), international organizations should take their responsibilities in this dangerous issue of environmental degradation that compromises already life of people around the world. So they face a requirement, that of developing an awareness

policy especially in underdeveloped countries where human activities are the cause of the deterioration of the environment.

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