

Public gardens: a means of biodiversity conservation in Cocody, Cote d'Ivoire



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ABSTRACT:

Our gardens, marshes, ponds, and forests are natural environment with remarkable flora and fauna, but they are sometimes threatened by human activity. The degradation of the natural environment spares no state. However, more writers are writing on the degradation of gardens while minimizing the conservation aspect of biodiversity. The aim of this article is to show the role of natural areas in the conservation of biodiversity.

The municipality of Cocody, a study area that has benefited from an urban development plan integrating green spaces in its development, has for some years been experiencing a degradation of its environment with the consequence of the disappearance of animal and plant species such as chlorophyllians, ensuring the most of organic production, by making the organic matter on which all other organisms will depend. Solutions have been proposed for sustainable conservation of biodiversity at different levels.

KEYWORDS:

Biodiversity, Public gardens, anthropogenic action, Côte d'Ivoire

INTRODUCTION

Access to natural environments: where does freedom of movement stop? This interrogation shows the interaction between the natural environment and society. In fact, biodiversity should not be an abstract word. We need to know it to manage it better. International conferences (conference of London on November 8, 1953; conference of Algiers on September 15, 1968) and national meetings were organized for an efficient management of the natural environment.

In Côte d'Ivoire, to combat this phenomenon, areas have been circumscribed and kept away from any exploitation activity. This political will was supported by the "International Community" which erected some of these spaces as biosphere reserves and, later, as UNESCO World Heritage.

Cocody, a residential commune north of Abidjan is not on the sidelines of this struggle. The municipal authorities have made the protection of biodiversity an essential issue in their policy, which is reflected in the creation and intensification of public gardens in its districts.

Taking environmental issues into account as well as preserving natural environments, which are a heritage and an asset that we must transmit to future generations, can no longer be considered as marginal concerns nor as constraints that we must only undergo. The reality of the evolution of the earth, the climate, animal and plant species is now indisputable and concerns each of us. At the same time, each territory and the people who live there must be able to keep hope for their future and the prosperity of tomorrow, which pass through human activities generating sustainable development and collective wealth. It has become imperative to find this new balance and reconcile economic growth and respect for our environment, which are closely linked, so that in the commune of Cocody, the standard and quality of life of all the inhabitants are assured for a long time. This is why; we must know who benefits from the management of the natural environment? Why manage it? And finally, how to manage it?

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I- Who manages the natural environments of the Cocody public garden?

The Cocody Public Garden provides environmental, ecological and eco-systemic services that support the life and well-being of the people of Cocody. In fact, developers are increasingly recognizing the consequent benefits of vegetation in urban areas. The contributions of M. Bonhomme (2012) and the editors of the review "Plante & Cité" (2013) allow us to take stock of the commonly accepted benefits. Overall, beyond their aesthetic and recreational functions, greening projects provide environmental, social and economic benefits.

Public parks and gardens and, generally nature in the city contribute first to "preserving the environment and natural balance". Their benefits are reflected in the quality of air, water, soil and in terms of wildlife and plant species.

1- The natural environment as a source of raw materials for the population.

Plant and animal species, and the very diverse molecules provided by this environment constitute essential resources for the survival and development of economic activities of urban populations, in several fields:

- 1) Food: it depends in part, on the direct consumption of wild species and cultivated biodiversity, thanks to the very many varieties of plants and animals.
- 2) Energy: firewood and charcoal represent an essential resource today in Côte d'Ivoire.
- 3) Industry: microorganisms (bacteria, yeasts or molds) are used to prepare or store food. Their industrial use in the field of biotechnologies, makes it possible to produce substances for pharmaceutical use.

2- Ecological value (maintenance and regulation of ecosystems)

Species play a major role in the functioning of ecosystems at all levels: in a "natural" environment and in artificialized territories, thus helping to maintain the environmental conditions necessary for our survival. Green plants (chlorophyll) provide most of the organic production, making the organic matter on which all other organisms depend. They also participate in evaporation, which is important in the water cycle and climate regulation. Micro-organisms (bacteria, fungus) ensure the degradation of organic matter, so that its constituents become consumable by plants; this recycling allows the functioning of the great cycles of nature that are carbon, nitrogen, and phosphorus. Animals share the plant resources, consume but also disseminate plants, and thus regulate ecosystems and maintain their stability in particular.

Urban greening helps purify the air. In fact, plants absorb various pollutants such as lead and fluorine. In addition, during photosynthesis, plants absorb carbon dioxide and release oxygen. They thus have the capacity to filter atmospheric particles produced by vehicles and industries and to reduce the effects of the release of this greenhouse gas. In addition, as mentioned by the Montreal Regional Environment Council, the impact of evapotranspiration can result in a reduction of the local temperature by 1 to 5 degrees Celsius. By taking water from the ground and then releasing it into the air as vapor, the vegetation has a cooling effect equivalent to an air conditioner. The temperature can actually vary from 4 to 8 degrees between a mineralized surface and a place under the treetops. Vegetation thus represents a concrete solution to curb climate change and moderate the effects of urban heat islands by creating islands of freshness.

In addition, green spaces also regulate the flow of water and limit the waterproofing of soils and reduce the risk of flooding and soil erosion. By absorbing a significant amount of water, vegetation reduces the volume of water treated in the plants, and also improves the degree of water infiltration into the soil and the recharge of groundwater.

Parks and gardens are biodiversity hotspots in urban areas. Through the presence of a variety of plant and animal species, green spaces also promote biodiversity by constituting a source of reproduction for many wildlife and plant species necessary for the functioning of the food chain. Trees provide the habitat for several species of birds and insects. For example, fruit trees provide a source of food for birds.

The conservation and establishment of green spaces also make it possible to stabilize the soil in particular, resulting from the actions of the roots of the trees promoting soil retention. Their presence on sloping land, banks and streams prevents erosion and helps to regulate the hydrology of the soil. In addition, the cover provided by the leaves limit the force of the rain and helps reduce soil compaction. The latter is also enriched with organic matter with the fall of the leaves.

3- Tourist potential and recreational value

The biodiversity of the environment allows better contact with nature during leisure activities such as gathering, hunting, fishing, observing nature, etc. The green spaces integrate a considerable social dimension.

In recent years, numerous scientific studies have demonstrated their positive impact on the well-being of citizens, representing an ideal environment for the practice of outdoor activities, green spaces contribute to the improvement of

Public gardens: a means of biodiversity conservation in Cocody, Cote d'Ivoire

physical health. By their purifying action, they also exert an important therapeutic effect which results in restoring body energy as well as reducing respiratory diseases and health problems related to excessive heat. Evoking a feeling of tranquility, they help reduce the stress of city dwellers and improve their psychological health.

According to a Swedish study, public areas which provide a stress-free environment which are accessible on a daily basis would have a positive and significant effect on the health of the inhabitants. "The results indicate that the more time people spend in green spaces, the less they are affected by stressful situations." Through their vocation as a gathering place, neighborhood parks and gardens reinforce "social ties and collective identity". They participate in "social cohesion" because they create opportunities for interaction between people from diverse social and ethnic backgrounds.

These places are also places in which events can be organized, and which constitute as many opportunities for meeting, and social exchanges. They also offer possibilities for targeted educational activities, thereby contributing to the culture and environmental education of citizens.

The presence of this garden offers significant tourist potential. Green spaces have a significant economic value. Their presence increases the attractiveness of a city and represents an incentive for future owners or even tourists. This tourist craze is recognized for large urban parks such as Central Park, Mount Royal, the Plains of Abraham, etc. They also constitute an asset for the property value of properties by increasing their monetary value.

I- Why manage the natural environments of the Cocody public garden?

Natural spaces have a primary vocation to conserve the habitats and the remarkable species. The maintenance of habitats and natural environments often requires space management, which takes account of past and current changes in these environments. Through this upstream of management choices, it is therefore necessary to understand how a site is evolving in order to be able to intervene effectively and drive "natural capital" towards a state deemed optimal.

After the Second World War, the expansion of urban areas, the mechanization of agriculture and the development of residential tourism led to an unprecedented regression of coastal natural areas, contributing to the erosion of biodiversity in the world.

1- FINDINGS: erosion of biological diversity

Recently, there has been a considerable acceleration in the extinction of biological diversity all over the world, at a much faster rate than that of the evolution of biodiversity. The genetic diversity within the species decreases by disappearance of many subspecies, varieties, and races. Indeed, in Cocody's public gardens, certain much localized plants, which are not very widespread, are on the way to extinction either because they are over-exploited or their particular habitats are disturbed.

From 1960 till date, 26 species of vascular plants have disappeared or are now found, in Côte d'Ivoire, only exceptionally. 70 other species are endangered or have become rare. Also, 82 species are listed in the categories of threatened species of the IUCN (World Conservation Union), in the particular groups of amphibians (1), birds (59) and mammals (22). This number is likely to be greater when it is known that the terrestrial fauna of Cocody is seriously threatened by factors such as the destruction of habitats.

These losses of biodiversity are attributable to the human species due to the strong anthropic pressure exerted on the natural environment to carry out developments. Cocody's garden is no exception. It suffers from significant deterioration due to the gardens that have completely disappeared, which are occupied by informal activity and poorly maintained gardens (Figure 1)

Public gardens: a means of biodiversity conservation in Cocody, Cote d'Ivoire

2- Causes and consequences of the erosion of biodiversity in natural environments in the COCODY public garden

- Agrarian pressure

Peri-urban agriculture is increasingly practiced by city dwellers in the shallows and in spaces devoted to gardens. The populations destroy the gardens created and prefer to grow food in them to feed themselves. Indeed, when questioned, during our investigations on the reason why they had transformed the spaces reserved for the public garden into a field of food crops, the cultivators replied for the most part in these terms: "we do not eat flowers and when we plants the flowers we can't even take care of them... that's why we use these spaces for peri-urban agriculture".

Cultural techniques and practices have remained very rudimentary and extensive, with serious agro-ecological consequences. This forces peasants to migrate to virgin land, to clear it and replace it with plantations, which poses a danger to the natural environment of COCODY. Peasants are a constant source of danger for animals. They cut them down because they see them as pests on the plantations.

- Nature and human intervention

If today, in multiple places, economic and urban development has frozen certain natural processes, it becomes necessary to intervene in other sites abandoned by man to maintain the stages of dynamic evolution of certain environments: area bare soil, herbaceous cover, progressive colonization of shrubs, seedlings of trees then wooded cover accompanied by each of their processions of plants and associated animals.

The manager must also deal with this reality and argue his choice of intervention or not on natural processes. Finally, the action of managing a natural environment to restore or preserve a precise stage of evolution can meet legal obligations, in particular European directives.

The management of natural spaces can thus be assimilated to an active conservation of the natural heritage: the maintenance of landscapes and biodiversity, but also of traditional tenure.

3- The need to manage natural environments in the COCODY public garden

From the above, we must manage natural parks to avoid their degradation, to correct the damage caused by human action, to maintain, for better preservation, better conservation and sustainable use of resources of the Cocody public garden.

This biodiversity has first of all an "inherent value": the numerous species which compose it deserve to be considered for themselves, they have the right to life. Also, because they are especially essential to our survival through the many services (material, food, humanitarian, economic, aesthetic, medical, cultural, tourist services ...) that they render and can render to the human species. Certain services provided by biodiversity are vital (oxygen, ecological balance, etc.). They are potentially useful resources for future generations.

II- How to manage the natural environments of the Cocody public garden?

The aim is to ensure that the management of Cocody's natural environment reconciles the needs of the populations with the need to conserve its biological heritage in the long term.

This management must necessarily consider seven factors which are:

1. Conserving biodiversity and protecting the integrity of Cocody's public garden.
2. Education, information and public awareness
3. Participatory management through the involvement of stakeholders (local community, political and administrative authority and the private sector)
4. Training and research
5. The enhancement of the biological diversity of the natural environment
6. Improvement of the legislative framework for the management of the natural environment
7. The fair and equitable sharing of the benefits of the natural environment

- 1- The conservation of biodiversity and the protection of the integrity of the natural environment

Conservation involves several actions:

- The development of the zoning scheme as the basis of any activity for the conservation of biological diversity and the sustainable development of the natural environment. Thus, there is an integral protection zone receiving most of the threatened biodiversity surrounded by a buffer zone, which can host any human activity compatible with the conservation of the biodiversity of the central zone, and which separates the latter from the peripheral zone which houses human habitations and economic activities.

Public gardens: a means of biodiversity conservation in Cocody, Cote d'Ivoire

- The regulation of the use of sites with economic and social value
 - Intensification of surveillance by setting up a special surveillance unit responsible for carrying out surveillance missions
 - The establishment of the transhumance corridor
 - The destruction of the plantations inside the public gardens
 - The implementation of biodiversity conservation conventions
 - The materialization of the limits and the control of all the access points to the site
- 2- Education, information and awareness of populations
- Inform, raise awareness and educate the actors and decision-makers of the municipality on the role that public gardens play in development.
 - Involve the Ministry of National Education in the implementation of this program
- 3- Participatory management through the involvement of stakeholders (local community, political and administrative authority and the private sector)
- Integrate the management plan for public gardens into the overall regional development plan for local authorities due to its proximity to neighboring regions.
 - Creation of a framework for collaboration and functional consultation between the various stakeholders (populations, agricultural management services, animal production, political, administrative, and customary authorities)
- 4- Training and research
- It will consist of:
- The provision of qualified staff motivated by the strengthening of staff capacity at all levels by providing them with continuous training, especially field staff
 - Fund research, rehabilitate the ecological research station in order to contribute to the conservation and sustainable development of natural environments.
- 5- Enhancement of the biological diversity of the natural environment
- Activate a mechanism for continuous funding of the natural environment by identifying potential partners at the bilateral level, capable of mobilizing resources to help finance activities; and the promotion of gardens in the commune of Cocody.
 - Develop vision tourism for the municipal natural environment.
- 6- Improvement of the legislative framework for the management of natural environments
- It consists of the establishment of an institutional and legal framework which allows
- Strengthen the legal protection of the site
 - Implementation of a regulation on the control of direct debits
- 7- Fair and equitable sharing of the benefits of the natural environment
- Set up income-generating micro-projects for the benefit of local populations with a view to fighting poverty
 - Implement measures that are mutually beneficial to municipal populations and political authorities
 - Facilitate access by populations to the cultural values of the site through regulations.

CONCLUSION

Although necessary for humans, the natural environments in the current state suffer from significant degradations, namely:

- An increased decrease in micro and macro invertebrates,
- A high infiltration rate
- Degradation of flora and fauna, etc.

This alarming degradation of the natural environment and its biological diversity is also due to:

- the limits of the current natural environment management system
- Insufficient concerted approach;
- The lack of support from the populations of peripheral areas for conservation actions;
- And the limits of the institutional framework

The various axis identified within the framework of this study will make it possible to reduce the serious threats which weigh on our environment. However, the success lies in a firm political will which would make it possible to implement in a coherent manner, in an appropriate institutional and regulatory environment, all the actions identified.

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LOCATION OF GREEN AREAS IN THE COCODY IN 2016

