

Assessment of Urban Forestry Contributions to Environmental Sustainability in Nigeria

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Abstract: - In developing countries like Nigeria, many of today's urban poor were yesterday's rural poor. Among other immediate basic needs, they bring to the cities with them, are fuel wood, low-cost construction materials and other wood products, easily accessible and affordable food and an adequate supply of clean drinking water and water for household use. Not only must their need and those of the people already living there be considered, but also how to fulfill those needs while maintaining or improving the urban environment. Urban forestry offers various potential benefits, including providing the urban poor with some forestry products mitigating the ecological effects of urban sprawl, and improving the living environment in urban areas. The paper therefore affirms that strategy for realizing these benefits have to be developed and planning of urban forestry initiatives should be integrated into the overall urban planning, technical, financial, human, and institutional requirements. The paper finally advocates for the need to encourage public, private partnership for a sustainable urban forest.

Keywords: Urban Forestry, Potentials, Urban Poor, Rural Poor

I. INTRODUCTION

Urban forestry is not a new concept, but it is one which appears to have growing potential. This is particularly true in Nigeria, where urbanization is geometrically on the increase with a demographic switch from rural to urban society. Although United Nations (UN) (1991) figures indicate that, in 1990 only 37% of the total population of developing countries was urbanized, it is predicted that by the year 2025 the proportion will be 61%. Already rapid and uncontrolled urbanization in Nigeria is having fundamental social and environmental consequences. The role of urban forestry in ameliorating this situation might, at first appear to be small but with significant environmental and material benefits to towns and cities of the country on the long run. Yet urban forestry may provide Third World town and city dwellers with significant environmental and material benefits. The paper outlines the current state of knowledge about urban forestry and the potential for future actions in Nigeria.

II. CONCEPTS OF URBAN FORESTRY

With increasing urbanization in the 20th century, the incorporation of trees into urban settlements has also increased which underscores the management of trees within urban setting as a distinct discipline of forestry. Urban forestry grew out of environmental forestry as conceptualized in the late 1960s by the North Americans. According to Miller (2001) urban forestry is an integrated, city wide approach to

the planting, care and management of trees in the city to secure multi-socio-environmental benefits for urban dwellers. Braatz (1993) defined urban forestry as the management of trees for their contribution to the physiological, sociological, and economic well-being of urban society. Urban forestry deals with woodlands, groups of trees, and individual trees, where people live - it is multifaceted, for urban areas include a great variety of habitats (streets, parks, derelict corners, etc) where trees bestow a great variety of benefits and problems. Urban forestry thus includes the management of individual as well as groups of trees and not restricted to trees that have been planted. Many urban trees may have established naturally, although in an environment in which competition for land is high, they are unlikely to survive long unless actively cultivated and managed. Johnston (2004) stressed the need for urban forestry to be a *planned, integrated, and systematic* approach to urban tree management. In this case, planning is important because trees are very often considered as an afterthought once development has taken place, rather than being incorporated at the original design phase (Salaudeen, 2012). An integrated approach implies the participation of many different organizations including stake and shareholders like - local councils, municipal and national planning bodies, departments. Systematic management entails regulated tree management tree information in an organized manner, at the appropriate time which seems more theoretical than actual in most urban settlements of the world. The varied ownership and access to land and trees in urban settlements inevitably renders overall management complex. Regarding legal control, there is generally more detailed, and strongly enforced legislation concerning the management of trees in cities of developed than developing country (Profous and Loeb, 2000) like Nigeria. Urban tree databases are well available in developed countries, as are inventory techniques and software packages to collate them. Such information is not yet fully in place in Nigeria.

Urban Forestry in Developing Countries

Urban forestry is a young and growing science, evolved in industrialized countries but still at its infancy in Nigeria where before now most urban agriculturists in development cooperation includes forestry in their overall definition of urban agriculture. Conversely, many urban foresters in industrialized countries use "urban greening" and "urban forestry" interchangeably (Kuchelmeister 1998). The broadest urban forestry definitions regard urban forests as the entire

area influenced by the urban population, including forests that traditionally are the realm of rural forestry. However, to deserve a new term urban forestry's main focus has to be on the portion of the forest found within the built environment aiming to make trees compatible and functional in an urban environment. Therefore urban forestry should be considered as planning, management and conservation of trees, forests and related vegetation to create or add value to the local community in an urban area (Kuchelmeister, 1998). Urban forestry in advanced countries focused on amenities and environmental benefits through long-term planning, interdisciplinary professional coordination and local participation (Nilsson and Randrup 2001) as against the need to fulfill basic necessities of life in country like ours through multiple resource management. According to Salaudeen *et al.*, (2006), urban planning and management systems must provide the framework in which forestry for cities should be considered by the ongoing health and vitality of urban forest and the sustained delivery of benefits for both current and future generations. Urban forestry is a modern approach to urban tree management encompassing long-term planning, interdisciplinary professional coordination and local participation.

Despite the benefits derived from urban forests, scanty body of knowledge is available in urban forestry in most developing countries like Nigeria. There is a dearth of published quantitative information about the relationship of urban dwellers (particularly the poor) in developing countries to urban green areas, on how they value, use or would like to use these areas, and how urban forests affect health and well-being. The proper management of urban forest implies an analysis of the social factors, and inventories of green sites (Kuchelmeister 1998). In the last two decades in industrialized countries many innovations have been generated in urban forestry, not all of which are appropriate and relevant for resource poor people. On the other hand, there are locally developed practices in urban forestry (like multistory gardens) that provide a basis to build on (Okonkwo *et al.*, 2009). Diverse ongoing urban forestry initiatives and practices in developing countries clearly demonstrate the urban forestry concept in action. These diverse approaches provide an appropriate framework about the benefits, challenges and actions required to facilitate the implementation of urban forestry activities (Salaudeen *et al.*, 2006b).

Decentralization and Devolution of Forest Land

Decentralization policies and urbanization have placed cities at the forefront of the global economy and have caused a shift in relationships between cities and federal governments. The shift in paradigm in urban planning is also shaping forestry. Increasingly, current management policy advocates a decentralization of responsibilities from central to local government and to communities. A redistribution of responsibilities is emerging with evolving new roles for many actors and the creation of partnerships between the different actors in urban development. For instance, the national

Philippine government devolved certain powers to the local government of Puerto Princesa City to manage forests. Further, the city government decentralized certain responsibilities to village level bodies for effective administration and implementation of schemes (Kuchelmeister 1998a).

National Forest Programs and Urban Forestry

The knowledge base which NFP has included urban forestry, how urban stakeholders are involved, what approach are used and what are the major reasons not including urban forestry is weak. Reasons according to Croso (1999) and Keeling (2008) for not incorporating urban forestry as a subject in national forest programs are:

- a matter of competence of municipal government
- not relevant to situation of the country

On the other side it is assumed that urban Forestry plays a very important role to all the countries in Latin America and the Caribbean, but the scale of priority for certain countries is unknown (Carneiro 1999). Zimbabwe has not identified urban forestry as a key subject, but there are good reason to include urban forestry as a subject into the NFP (Gwaze, 2001). Other NFPs like the one for Panama consider incorporating urban forestry, but indicated that they would require assistance in this new field of action (Lombardo, 2003). However, some National forest policies or Forest Sector Master plans included urban forestry. For instance, in an attempt to institutionalize urban forestry, the Philippine government through the Department of Environment and Natural Resources (DENR) incorporated urban forestry as one of the major components to its Master Plan for Forestry Development (Kuchelmeister 1998b). In Senegal, South Africa, Sierra Leone, and Fiji urban forestry has been identified as a key subject of the NFP. Cities in Senegal are aware about the NFP process (Ndiaye 1999) and cities in Bangladesh implement urban greening as part of the National Plan (Chowdhury 1999).

Nearly 66 % of all South Africans live in cities and towns. A proliferation of urban forestry activities has been carried out as a fragmented series of projects. *Recognizing that the full potential of urban forestry is not being realized, due at least in part of the lack of an integrated strategy urban forestry has been identified as one of the key subjects of the NFP of South Africa. It will be important for Nigeria to learn from these and similar experiences to further develop guidelines for NFPs (DWAf 2006) and the NFP made considerable efforts to include urban stakeholders into the NFP. In other countries the urban stakeholders involved are unemployed youth like in Sierra Leone, or landowners in Fiji. There is an urgent need to develop guidelines on how to identify and involve urban stakeholders and disseminate lessons learned from urban forestry programs under the umbrella of NFPs in Nigeria.

III. IMPORTANCE OF THE URBAN FORESTS

Multipurpose Values of Urban Forests

Urban forests improve the quality of urban life in many ways including tangible and less tangible benefits to meet local necessities. The consumable products include fuelwood, food, fodder, and poles. Urban forests improve air, water and land resources, provide habitats for wildlife, control erosion, protect watersheds for urban water supply and can be an outlet for safe disposal of urban wastes. Additional benefits to society, especially for low-income citizens are significant and relate to improvement of health, recreation, environmental education, aesthetics, and enhancement of landscape. Tree products, if sold, provide direct cash benefits; if used within the household they provide indirect cash benefits by freeing cash income for other uses. Trees themselves can improve existing savings/investments, secure tenure or increase property value. Urban areas in Nigeria and other developing countries face similar problems related to the lack of safe water, inadequate waste management and pollution control, occupation and degradation of sensitive lands, flooding, soil erosion in unauthorized settlements, above all many resource-poor people are mal nutritious and have no space for recreation. Only multi-resource urban forest management is feasible in poor neighborhoods, where multi-functional parks are a component of slum improvement program by using parks for storm water catchment and waste water, sewage treatment, recreation and gardening. This new park concept requires partnership between different departments (water and parks) and urban poor (Kuchelmeister, 1999 and Salaudeen *et al.*, 2006b). Multi-functional urban vegetation resource management is increasingly becoming one key element in designing cities by nature and can be also used as a tool for poverty alleviation.

Tangible Benefits

Trees can contribute significantly to the food requirements of the urban poor, both on a daily basis and in times of crisis. Urban tree crops can significantly contribute to food security in poor areas (Salaudeen *et al.*, 2006a). Often low-care wild edible plants are excellent multipurpose candidates for use as ornamental roadside plantings. Some parks have been turned into an 'edible' public park to provide fruit, herbs, flowers and vegetables to anyone walking by. Woodfuel provides between 25 and 90 percent of urban household energy supplies, especially in smaller urban centers (UNDP 2008). Urban poor find themselves in a worse position than their rural counterparts in Poor urban households spend a significant proportion of their cash income (15 to 22 %) on energy (Barnes *et al.*, 2003) or assign labor to fuelwood gathering to offset the costs which they cannot afford. Inexpensive charcoal is as close as many householders in poor countries will come to modern fuels (Van der Plas, 2005). Sustainable use of woodfuel is beneficial for the global climate, because it is carbon-neutral, whereas substitution by fossil fuels would add to the greenhouse effect.

Environmental Services

Trees and related urban vegetation can significantly contribute to improving the air quality by cooling and cleaning the air. Energy conserving landscaping by strategically planting trees can maintain comfort without air conditioning. Since urban trees reduce the need to burn fossil energy, they are a cost-efficient investment for green house mitigation. Urban trees can mitigate pollution through reducing energy use, CO₂ emissions, and ground-level ozone, as well as by purifying the air. Trees and other vegetation can help in protection of urban water supply, wastewater treatment systems and storm water management. Most poor cities in the region face significant wastewater treatment challenges and could integrate stabilization ponds into park systems and could reuse wastewater for urban forestry. Reused waste city water not only recharges aquifers but also reduces the demand exerted on scarce water reserves. With steep terrain and where there is little vegetation and harsh seasonal rains, landslides can be threats to people's lives and homes. Trees and forests, also used as bioengineering techniques are good soil conservation practices (Kuchelmeister 1998). Recycling of waste from urban reduces the need to dispose of amounts of waste and secures new raw materials from extraction for re-use. Unused and degraded land and terminated landfill sites can be reclaimed through afforestation and converted to parks (IDB 2007). Older urban gardens and parks often contain noticeably rich biodiversity. On a larger scale urban forests can create or restore biological diversity that will reconnect a city to its surrounding bioregion. Suburban wetlands can be some of the most productive natural ecosystems and can provide important habitat for fauna. Incorporating green areas through networks will improve biological conservation and biodiversity; e.g. greenbelts and greenways (linear parks) can serve as biological corridors (Kuchelmeister 1998).

Social Benefits

Vegetation reinforces spontaneous attention by people, allowing sensory apparatus to relax and infusing viewers with fresh energy. Certainly, improving air quality through planting vegetation has passive impact on health with such obvious benefits as decreased incidence of respiratory illnesses. Urban forestry can provide jobs for the poor as both skilled and unskilled labour. Tree planting and especially urban agroforestry systems can be labour-intensive and provide both initial start up jobs as well as more permanent employment in tree care. There is also considerable income in growing and selling flowers and ornamental plant seedlings. There are also opportunities for all kinds of formal and informal enterprises related to recreation. Urban forests provide many educational opportunities. A number of cities have botanical gardens, zoos, natural trails and even visitor information centers that can inform people about flora and fauna. Lower income residents tend to frequent city parks more than wealthier citizens do because they lack the financial constraints and leisure time to reach distant recreation sites. To be useful to low-income people, forests and green areas must be within an

affordable travelling distance and have the amenities which people prefer (IDB 2007).

IV. CONCLUSIONS

Until recently the loss of trees in and around the places where people live has hardly received attention in development cooperation. Increasingly urban greening is advocated as one development tool, mainly by the agricultural community, while forestry circles are conspicuously absent. Also most NFPs do not consider urban forestry. In view of the fact that developing countries are undergoing a transformation from rural to urban, and that urban forests are capable of mitigating some of the pressing problems associated with urbanization, there is an urgent need to include in NFPs a focus of the needs and values of urban societies. The policy trends of decentralization and devolution of forests to municipalities is another important consideration to include urban stakeholders in the NFP process. As the pressure to further develop open space continues in developing countries the importance of urban forests as a vital component of the urban landscape and infrastructure will increase. This is expressed in innumerable Local Agenda 21. Where the whole community is considering local quality of life, trees, woods and accessible green space are usually high on the list as measures of environmental quality. To develop and sustain urban forests in low income cities and neighborhoods like the Nigerian cities, the initial focus must be on meeting immediate needs for basic necessities. This can be best achieved by multiple resource management. In a time of continuing urbanization, the role of urban forestry is expected to grow. As urban values and demands are becoming increasingly dominant world-wide, it can be assumed that urban forestry will become the forestry of the future. Forestry and related professionals can actively support initiatives to mitigate urban problems or risk to become increasingly a marginal professional group in development cooperation in the urban millennium. It is overdue, that bi- and multilateral development agencies respond to the growing demand for assistance in urban forestry. It is time for action for the urban millennium. NFPs can become one partner for considering the needs and values of urban people, especially most vulnerable ones.

V. RECOMMENDATIONS

The development cooperation community should extend its forestry sector attention significantly beyond rural areas towards the growing cities by:

- 1) strengthening existing forestry linkages and initiatives with urban stakeholders (fuelwood; trees in farming; watershed management, drinking water supply, National Environmental Plans);
- 2) encouraging the strengthening of mutually beneficial local rural-urban linkages and mitigating their negative impact;
- 3) allocating increasingly resources to research and development of multipurpose urban forestry;

- 4) updating the forestry research agenda by incorporating urban issues, and developing strategic urban alliances for refining the urban forestry research agenda;
- 5) considering urban issues in national forestry programs
- 6) developing guidelines for urban forestry projects to facilitate appraisal, design and implementation of urban greening related activities;

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