

Parks Provision and Management in Urban Areas on Nigeria: The Example of Akure, Ondo State

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Abstract

This paper examined the availability and management of parks in urban spaces in developing societies utilising the situation in Akure, Ondo State, Nigeria as a case study. It identified and discussed the challenges associated with parks development and maintenance in the study area and suggested how to improve the prevailing situation. The paper draws extensively from a systematic survey and examination of the existing parks in the city. In-depth interviews were conducted with selected individuals and professionals in built environment on the availability, use and management of parks in the city. Officials of government Ministries and Agencies such as Ministry of Housing and Urban Development, Ministry of Environment, Ondo State Development and Property Corporation and Akure South Local Government were also interviewed to obtain essential information. The perception of the city dwellers on the management of the parks were sought through the use of 800 questionnaires which were administered purposively on users. The study found low patronage of parks in the study area and that conscious efforts have not been made in recent times to create parks as part of urban amenity in the city. Besides, the traditional parks and those created by colonial government have been encroached upon and in some cases converted to other uses. Moreover the few ones were not effectively managed repaired and maintained and have fallen to a states of obsolescence. There is therefore gross inadequacy of parks in the city which the paper argued has denied urban dwellers access to quality recreational facilities and has therefore reduced the liveability of the city. There is a need for the creation of an agency that will take on development and maintenance of parks in the city.

Keywords: Built environment, Urban parks, Parks development, Parks maintenance

Introduction

The role of parks in cities and urban metropolitan areas has become much greater as the scope and impact of parks increasingly influences quality of life, economic development, health, and many other aspects of urban life (Levitz, 2014). Urban parks, and particularly botanical gardens with their wide collection of trees and other plants, have a huge educational potential and they are an important recreational facility in developing as well as developed countries. Urban and recreation facilities make for a better living environment in the world. The park is a well-used place that attract people of different ages, genders, and backgrounds use a park on a regular basis during all parts of the day, week, and year. This is why recreation and parks development have been identified as fundamental part of human development as well as a necessity for socio-economic development process in modern times.

Thus, in recognition of the unique role of recreation in contemporary times, the International Association for Sports and Leisure Facilities (IAKS) and UN-HABITAT to agreed on Plan of Action to start the conception, planning, and provision of playgrounds, parks, and recreation facilities around the world, especially in the towns and cities of developing countries including Nigeria where such facilities have either fallen derelict, inadequate or are lacking altogether. According to UN-HABITAT "Having city parks and recreation facilities makes for a better living environment in a world where most of us already live in towns and cities. In this rapidly urbanizing world, proper urban recreation facilities are increasingly being recognized as essential for a socially sustainable urban environment". This has made the provision and development of parks essential especially in modern times where urban centres are gradually being densely built with little or no spaces for green and play areas.

Moreover, physical activities, sport and recreation are a fundamental part of human development and of the socio economic developmental process in every country. These activities are particularly important in developing countries where the population has more needs and less opportunity. In Akure, there is general lack of organized and properly planned recreational facilities and parks to meet the increasing needs of the growing population of the city. Yet parks and recreation resources that can be developed to improve the quality of the environment and life of urban dwellers abound in the area.

In Nigeria, one of strategies specified in the New National Housing Policy (NNHP, 2012) recently



launched in the country is to ensure that provisions are made for formal parks, gardens, open spaces, greens, trees and general landscaping elements to enhance ecological balance. (NNHP, 2012). The policy made adequate provisions to ensure that they are maintained as well as sustained and not converted for other uses. In addition, the new urban policy seeks to create and expand the urban economy through the development of industrial estates, business parks, markets, shopping centres, recreational and tourist resorts, etc, so as to widen the scope and significantly increase the contributions of cities to national economic growth, poverty reduction and social welfare. It is therefore essential to examine the development of existing parks in the city so as to be able to ascertain the challenges associated with their provision, usage and maintenance. It is in realisation of the important role and contributions of urban parks to city development and prosperity that this paper—seeks to examine the creation, development and management of city parks in Akure, the capital city of Ondo State of Nigeria. In doing so, it examines the challenges and prospect for urban parks development in the city

Conceptual Framework and Relevant literature

The literature is replete with documented social benefits of parks generally. As destinations for playing and recreation, they have long served as community gathering places and locales for ctivity and fun. Play grounds, athletic fields, swimming pools and gardens within parks provide tangible benefits during residents leisure times (Levitz,2014). A park is an area of open space provide for recreational use, usually owned and maintained by a local government. Parks can be divided into active and passive recreation. It is argued, however, that urban parks and open green spaces are of a strategic importance for the qualityof life of our increasingly urbanized society (Girardet, 1992; EEA, 1995, 1998). Increasing empirical evidence indicates that the presence of natural assets (i.e. urban parks and forests, green belts) and components (i.e. trees, water) in urban contexts contributes to the quality of life in many ways. (Chiesura, 2004). Besides important environmental services such as air and water purification, wind and noise filtering, or microclimate stabilization, natural areas provide social and psychological services, which are of crucial significance for the liveability of modern cities and the well being of urban dwellers. (Chiesura, 2004). A park experience may reduce stress (Ulrich, 1981), enhance contemplativeness, rejuvenate the city dweller, and provide a sense of peacefulness and tranquility (Kaplan, 1983).

In a survey among park's visitors, a significant relation was found between use of the parks and perceived state of health: those who used local parks frequently were more likely to report good health than those who did not (Godbey et al., 1992). Schroeder (1991) has shown that natural environments with vegetation and water induce relaxed and less stressful states compared with urban scenes with no vegetation. This ability of natural elements to function as "natural tranquillizers" may be particularly beneficial in urban areas where stress is an all too common aspect of daily living (Van den Berg et al., 1998). Beside aesthetic, psychological and health benefits, natural features in cities can have other social benefits. Nature can encourage the use of outdoor spaces, increases social integration and interaction among neighbours (Coleyet al., 1997).

The presence of trees and grass in outdoors common spaces may promote the development of social ties (Kuo et al., 1998). Kuo et al. (1998) also found out that greenery helps people to relax and renew reducing aggression. Natural environments can also be seen as a domain of active experience providing a sense of challenge, privacy and intimacy, aesthetic and historical continuity. Besides the social and psychological benefits mentioned above, the functions of urban nature can provide economic benefits for both municipalities and citizens. Air purification by trees, for example, can lead to reduced costs of pollution reduction and prevention measures. Furthermore, aesthetic, historical and recreational values of urban parks Increase the attractiveness of the city and promote it as tourist destination, thus generating employment and revenues. Furthermore, natural elements such as trees or water increase property values, and therefore tax revenues as well (Tagtow, 1990; Luttik, 2000).

There is need for man to live in an environment that is conducive for living, working, worshiping, and recreation and has necessary aesthetic qualities. To achieve such a balanced environment, provision must be made for various land use activities in the right size. This is why in Nigeria, as indicated earlier the New National Housing Policy and New urban policy make the creation of urban parks mandatory. In addition, physical infrastructure in most of the cities in Nigeria, are generally inadequate and the available ones are in a state of dilapidation. Government funding in the provision of social infrastructure is grossly inadequate. The degradation of urban environment limits the abilities of growing, shifting population to establish communities with a minimum standard of decent living (World Bank, 1999).

Just like urban parks have some socio-economic benefits, it has been argued that it also has some environmental benefits. For instance, urban parks, and particularly botanical gardens with their wide collection of trees and other plants, have a huge educational potential. While this tends to have been exploited to a greater extent in developed countries, it is by no means restricted to them. Urban parks and peri-urban forests are an important recreational facility in developing as well as developed countries. Thus on public holidays, numerous urban dwellers avail themselves of the available inadequate and substandard relaxation centres to refresh. One of



the dominant issues in planning the built environment is planning for beauty, which is rooted in urban open spaces development. A classical example is the City Park Movement made popular by 1865 Fredrick Law Olmstead design of city of New York Central Park. (Mumford, 1961) The City Park Movement was conceived as an environmental solution to the decadence and social ill of eighteenth and nineteenth centuries industrial revolution characterized by urban congestion, depressed slums, pollution and embarrassing plagues. The concept introduced nature to the crowded cities and sub urban township of America. Planned open spaces and natural recreational areas were conceived as escape valves for urban dwellers in search of relief from the social, physical and psychological oppression of the vices of industrial centres.

In England, Ebenezer Howard in 1902 introduced the "Garden City Concept" on the same philosophy of living with nature (Gallion et la 1980). Conceived on a city scale, the proposed nature oriented human settlements were to be equipped with sufficient number of public parks, private gardens and physically defined by green belts as a two dimensional moat that keep man and nature in perfect harmony.

Again in Nigeria, the 1999 federal constitution of the country is explicit on the role of the third tier of government in the country. The Local Government is charged with the responsibility of establishing cemeteries, public recreational facilities and parks. (Federal Government of Nigeria Constitution, 1999). In summary, the provision and maintenance of urban parks in Nigeria is the sole responsibility of local governments in the country.

Study Area and Methods

Akure the setting for the study is a traditional Nigerian city and like other traditional Yoruba towns in the country, it existed long before the advent of British Colonial rule in the country. The city is located within Ondo State in the South Western part of Nigeria. Ondo state is one of the 36 states that make up Nigeria. It lies approximately on latitude 7 15" North of the Equator and longitude 5 15" East of the Greenwich Meridian. Akure is a medium-sized urban centre comprised of two local governments (see fig.1) and became the provincial headquarter of Ondo province in 1939. It also became the capital city of Ondo State and a Local Government headquarters in 1976. The city's morphology has changed over time to assume its present status with its attendant environmental problems, as experienced in similar medium sized urban centres in Nigeria, thereby making the creation of open spaces and parks necessary particularly in recent times.

The city is located approximately 700 kilometres South West of Abuja, the Federal Capital of Nigeria and about 350 kilometres to Lagos the former federal capital of Nigeria, It is located within the tropical rain forest region of Nigeria where rainfall is high through the year. The increased relative political influence of Akure as a state capital since 1976 has greatly promoted its rapid growth and increased socio-economic activities resulting in its spatial expansion from an area of about 16 squares kilometres in 1980 to about 30 square kilometres in 2000 (Ministry of Works, Lands and Housing, 2000). This has a lot of implications on the parks provision in the city. The population of the city grew from 38, 852 in 1952 to 71,106 in 1963. Its population was estimated to be 112,850 in 1980 (DHV, 1985); and 157,947 in 1990 (Ondo State of Nigeria, 1990). The 1991 National Population Census however, puts the population of Akure at 239,124 and its estimated population in 1996 was 269,207 (NPC, 1996). At present using a population growth rate of 3 per cent, the city is estimated to have over 400,000 people.

The scope of this article required a comprehensive data set containing variables descriptive of the economic, social and environmental characteristics of park users Akure, the setting for the study. To this end 800 questionnaires were made and administered on park users. Other information was obtained on the availability, use and management of urban parks in the city. Personal field observations and in-depth interview were conducted on selected individuals and operators of parks in the city. The technique adopted includes visitations to the parks to make systematic observations of the phenomenon. Information was collected from sites selected for the study. Simple descriptive statistical techniques were employed to present the results of the study.

Urban Parks Development in Akure

From the conceptual framework undertaken above, recreational facilities and parks have been grouped into nature based facilities and man-made facilities. This is adopted to describe or classify urban parks in the study. In the traditional set up of Akure, open spaces were generously provided in all parts of the city to protect the environment and for community uses such as traditional games and festivals as well as for public meetings that were common in the traditional system in Nigeria. Such open spaces include the areas surrounding the Oba's palace and other traditional sites. However, most of the traditional open spaces have been converted to other uses. The various traditional open spaces that were generously provided in the pre-colonial period in the city have been converted to other uses such as shopping complex, petrol filling stations and commercial office complex among others.

However, the recognition of the social economic and environmental uses of parks motivated government at the state level and private individuals and organisations to begin to create and develop new open



spaces and parks in the city. This constitutes the focus of this section. Some of the most important parks are therefore identified investigated and discussed as follows:

Ondo State Ministry of Agriculture Botanical Garden

The Ondo State Botanical Garden is owned and managed by the Ondo State Ministry of Agriculture. It has a collection of tree species interspaced with other shrubs (Oladeji and Adedapo, 2014). The garden has a nursery section and sitting arena for visitors to seat and relax. It also provides relaxation facilities and services and food and drinks. The centre has about 10 staff and receives between 200 and 300 visitors in a week with the highest number of visitors coming during week end (Oladeji and Adedapo, 2014). An assessment of the park revealed that the place is poorly utilised. It other words, the park is not fulfilling other purposes for creating public park.

Afolayan Wildlife Park

The park was created by Federal University of Technology, Akure for the main purpose of training students. It is presently serving as both in situ and ex situ conservation purposes. Some parts of the par are designed as Zoological (Ex-situ) the other parts serve as undisturbed semi-wild area or sanctuary (in-situ). The park receives over 300 visitors in a month and over 2000 in a year (Oladeji and Adedapo, 2014).

Alagbaka Biological Park

The park was the state government botanical garden initiative under the Ministry of Agriculture and Department of Forestry in particular. It was created to serve as a picnic ground for Akure citizens but has since been converted to mere drinking spot when its management was handed over to the Ministry of Commerce. It is located along the Akure -Owo road in Alagbaka.

Aside from this, there have been some efforts in the construction and redevelopment of other parks in 2009. For instance, Ilula Recreation Park was recovered, redesigned and redeveloped. Before, then the neighbourhood park has been in a derelict situation. Ilula park is a recreation or relaxation centre for all category of people old, young, man and woman. It has facilities for both active and passive users. The recreation outfit is provided with facilities such as table tennis area, volley/basket ball court, security post, and parking space all located within a well landscaped and secured enclosure (Ondo State, 2011).



Plate 1: A View of the Urban Park in Akure, built as a result of the Urban Renewal Programme

Availability and Use of Parks in the city

As elaborated earlier, a number of parks provided by the state government department and agencies exist in the city. Others were created by private organizations and individuals. An assessment of parks in the city indicated paucity of adequate parks especially from the public sector to beautify the city as well as provide opportunities for residents of the city to relax and recreate. An examination of the process of establishing the existing parks revealed that they were not deliberately or consciously created to provide avenue to relaxation in the city. Besides those recreation centres that has evolved as drinking spots, no parks was consciously created to cater for the need of the youth and adult populations in the city. This account for why people visit water fountain and intersection design at Fiwasaiye Grammar school during festivities. These spots were introduced to add to the



aesthetics beautiful of the city but have been turned into due to paucity of such amenities in the city. Field survey into new areas of the city such as Oke aro titun, Gaga, New Town along Idanre road among several other communities revealed lack of public parks.

Management of Urban Parks in Akure

As indicated above, two forms of parks exist in the city by ownership. In other words urban parks in the city can be grouped into two. They are those that are publicly created and managed as well as those that are privately owned and managed by private individuals and organizations in the city. Others are those created and managed by government department and agencies. From the public side, only the state government departments and agencies are involved in the creation and management of parks in the city. Field investigations revealed that Akure South local Government that is constitutionally charged with the responsibility of parks creation and development have not yet take on the assignment. In other words, no park creation and development can be traced to the local government. On the parks created by the state government departments and agencies, Ministry of works is responsible development. Once, parks have been constructed, their management becomes the responsibility of the Ministry of Environment. The Ministry of Environment manages some directly and concessions some to contractors who manages them.

As earlier specified, the constitution of Nigeria assigned the responsibility of developing urban parks on the local government. Investigations by the researcher revealed that Akure South Local government that should be responsible for parks development in the city do not have parks. Besides the fact that the local government have failed to perform this function, the local government is not involved in managing parks in the city. From the public side, only the state government departments and agencies are involved in parks development and management in the city. These include neighbouhood parks.

On maintenance of parks, field investigations revealed that there is no clear cut maintenance policy in practices for the parks management in the city. The publicly owned parks are maintained by the Ministry of Environment. Investigations revealed that some of the government owned parks are directly managed by the ministry where the staff carryout regular maintenance. However, most of the parks are concessions to contractors to manage on agree terms and fees. Visits to the major public parks indicate lack of adequate maintenance due to delay in release of funds and incompetence on the part of the contractors that obtain the contract as political patronage from the government in power.

Perception of Residents on Management of Parks in the City

The central focus of parks development is man. The study started by investigating the level of consumption of parks by assessing the rate of visits to parks in the city

Table1: Frequency of Visits to Parks

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Schedule of Patronage	Freq	%
Every week	103	12.8
Fortnightly	55	6.9
At least once a month	291	36
Occasionally	351	43.9
Total	800	100.0

Source Fieldwork 2015.

The study established that there is indeed poor patronage of these facilities in the city. This might be related to the level of poverty in the country. The Human Development Report (2009) rate Nigeria as the 24th poorest country in the world with 70.2% of its population living below the United Nations Poverty line (US\$1 per day). Under this circumstance patronage of tourism becomes the least priority. An examination of Table 1 reveals that almost half of the respondents (43.9%) patronise the parks occasionally, 36% every month and 12.8% every week. This level of patronage may not be enough to sustain this sector on the long run in term of maintenance and investment into new facilities. This might have been partly responsible for the rot experienced in the sector

Challenges of Parks Development in the city

Since the consumers of parks like every other commodity want value for money, the study went on to evaluate the level of user's satisfaction of such facilities. The study found out that out of the 800 park users sampled, 94(11.7%) were satisfied while 706(88.2%) expressed non-satisfaction with all aspects of parks development and management in the city. The implication of this is that only 1 out of every 8 users is satisfied. The study proceeded to investigate the reasons for non satisfaction among these 706 users. Varieties of opinion were expressed. These were categorized below.



Table 2.Reasons for Users Poor Satisfaction

Aggregate Opinion	Freq	%
Poor maintenance	385	54.5
Non availability in every Neighbourhood	52	7.4
Insecurity/loss of serenity	131	18.6
Non availability of Facilities	138	19.6
Total	706	100.0

Source Fieldwork 2015

The study established as shown in Table 2 that the major reason for poor satisfaction is the perceived poor maintenance of parks. This opinion was expressed by 54% of 706 people that were dissatisfied with the operation of parks in the city. Other significant opinions expressed included the problem of non availability of facilities like eateries (19%) and insecurity, visual intrusion and absence of security (18.6%) the last being its non availability of parks in every neighbourhood (7.5%)

As a solution 39% of the respondents picked consistent maintenance, 29.6% picked privatisation of government owned parks for sustainability, 18.9% picked improved security in parks as shown in Table 3.

Table 3: Perception of Respondents on Solution

Aggregate Opinion	Freq	%
Privatisation	209	29.6
Improved maintenance	277	39
Improved security	134	18.9
Establishment of parks in every Neighbourhood	86	12.1
Total	706	100.0

Source Fieldwork 2015

From administrative perspective one of the most important government induced challenges found with parks development in the study area is lack of specific department or agency charged with the development of parks in the city. Thus, a number of government departments and agencies of state government take on the responsibility of developing parks in the city. Each of them develops their parks without reference to one another. For instance, the Ministry of Agriculture created and is managing some parks. The Ministry of Works creates some parks in the city while Ministry of Environment manages parks. This has led to the problem of uncoordinated and haphazard parks development and maintenance

Moreover there is absence of identifiable authority or agency responsible for managing urban parks in the city. At present a number of government department and agencies are responsible creating the problem of coordination. Absence of landscape department in the Ministry of Environment to be responsible for parks management is another challenge associated with public parks development in the city. While the Ministry of Environment as explained above is responsible for parks development and management, findings revealed that the Ministry did not have landscape development. It therefore becomes difficult to carry out effective maintenance of available parks in the city.

One of the goals of the state urban development policy is to promote and encourage the preparation of appropriate development plans, strategic urban plans, local action plans, to guide the growth and development of the towns. Unfortunately this aspect of the policy is yet to be implemented. Thus, one of the problems associated with parks development in Akure is lack of plans to determine the location, guide the development and its management of parks in the city. There is therefore eclectic creation of parks without regards to their overall forms and influence in the city. Moreover there is lack of landscape considerations in the preparation of master plan for the city. There is non-availability of horticultural garden in Akure. Investigation revealed that horticultural materials are procured from other towns such as a Benin City and Lagos and absence of any physical development plan to guide, control and direct the creation and development of parks.

Policy Implications

The study established poor patronage and management of parks in the study area . From field investigations there are no consistent and programmed methods of managing both public and private parks in the city. No agency is directly responsible for managing the existing parks in the city. While the Ministries of Works, Ministry of Housing and Urban Development are involved in creating and developing city parks, the maintenance and management is the responsibility of the Ministry of Environment. There is a need for the creation of an agency that will take on this responsibility. Another major finding that has a lot of implication is lack of city wide master plan and landscape for the city. The consequence of this is that parks are indiscriminately created and developed without a guide to determine location and types of parks in the city. This calls for a landscape plan for the city that will specify where parks are to be located, who will be responsible and how it will be maintained and managed.



On the management side it is imperative from the responses of users that privatization of parks will solve a lot of problems. These problems include development and maintenance of users responsive market determined parks which are sustainable and related to the culture of the people.

Conclusion

This paper has been concerned with an investigation of the development, maintenance attitudes, and perception of Akure residents to parks development in the city. The study is premised on the important roles that parks development play in improving the health, wellbeing, livability and sustainability of towns in the world over. The study adopted analytical approach in combination with the use of questionnaire to investigate the perception of parks users in the town. The study established low patronage and maintenance of parks, lack of plans to determine the location and guide the development and management of parks in the city and non consideration of greenbelt development in the city master plan. As a consequence parks development has been amorphous haphazard and uncoordinated. The study established that this problem can be solved with the creation of separate body that will be charged with the responsibility of parks development, and that on the management side, parks are better managed as a private sector initiative within the framework of the existing master plan and will prove more efficient on the long run.

References

Chiesura, A. (2004): The role of urban parks for the sustainable city Landscape and Urban Planning 68 129-138.

Coley, R., Kuo, F., Sullivan, W., 1997. Where does community grow? The social context created by nature in urban public housing. Environ. behav. 29, 468–494.

Dena Levitz (2014); The Role of Parks in shaping Successful Cities, a White paper prepared for Ntional Recreation and Park ssociation and American Planning Association.

DHV Consultants (1986); Ondo State Urban Development Project Preparation Study, Volume 2: Annexes. Pp 1-19.

European Environment Agency (EEA), 1995. Europe's Environment: The Dobris Assessment. Stanners, D., Bourdeau, P. (Eds.), Copenhagen.

European Environment Agency (EEA), 1998. State of the European Environment. Copenhagen.

Falade J. B (1985). Nigerian Urban Open Spaces: An Inquiry into their Evolution, Planning and Landscape Qualities, PHD, Thesis, Department of Architecture, University of Edinburgh, Scotland.

Federal Republic of Nigeria (1999.) Constitution of the Federal Republic of Nigeria Fourth Schedule. Function of a Local Government Pp. 150-151.

Falade, J. B. (2013):Strategies and capacity building programme for harnessing ondo state tourism resources for accelerated economic development

Gallion A.B, Eisner S. (1980.) The Urban pattern City: Planning and Design. D.VanNostrand Company New York.

Girardet, H., 1992. The GAIA Atlas of Cities: New Directions for Sustainable Urban Living. Anchor Books, New York.

Godbey, G., Grafe, A., James, W., 1992. The Benefits of Local Recreation and Park Services. A Nationwide Study of the Perceptions of the American Public. College of Health and Human development, Pennsylvania State University, Pennsylvania.

Kaplan, R., 1983. The analysis of perception via preference: a strategy for studying how the environment is experienced. Landsc. Urban Plan. 12, 161–176.

Kuo, F.E., Bacaioca, M., Sullivan, W.C., 1998. Transforming inner city landscapes: trees, sense of safety, and preferences. Environ. Behav. 1 (30), 28–59.

National Population Commission (NPC) (1996); Census '91 Final Results. Ondo state.

Oladeji, O.S. and Adedapo, O.O. (2014); Performance and Visitor's Satisfaction of Recreation Facilities in Akure Metropolis: A Veritable Tool for Impacts Studies in Undp Mdg's Cities in Nigeria. British Journal of Economics, Management & Trade 4(8): 1230-1250, 2014

Ondo state Government (1990); Digest of Demographic Statistics of Ondo State. Ministry of Finance, Budget and Planning, Akure.

Tagtow, R., 1990. The need for urban forests. Am. City County 105, 74-75.

Schroeder, H.W., 1991. Preferences and meaning of arboretum landscapes: combining quantitative and qualitative data. J. Environ. Psychol. 11, 231–248.

Ulrich, R.S., 1981. Natural versus urban sciences: some psycho-physiological effects. Environ. Behav. 13, 523–556.

Berg, A., van den Top, I.M., Kranendonk, R.B., 1998. Natuur wensen van stadsmensen (The Demands on Nature of Urban Citizens) (in Dutch). IBN-DLO Rapport, Wageningen, The Netherlands.