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### **Research Paper**

# Assessment Of Urban Forestry Practices Among the Households of Makurdi Metropolis

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#### **ABSTRACT**

The study assessed the urban forestry practices among the households of Makurdi Metropolis and other structures on urban forestry to identify the socioeconomic characteristics, tree species, willingness to participate in tree planting and the factors influencing tree planting in the study area. One hundred and eighty respondents were randomly selected from the study area with a structured questionnaire. Results revealed that there was a difference between the sexes that practice urban forestry showing that the practice is carried out by both sexes with more secondary school results and this determined the attitude of the respondents towards the study. Farmers and civil servants constituted 30.0% of the respondents with a mean annual estimated income of \$979,892.78. Different tree species were identified with more of Moringa oleifera and Mangifera indica which provides a lot of benefits. There was low participation of people in tree planting (P < 0.05) showing that there was no significant difference between the study area and the level of participation. Time factor was the most challenging factor influencing the people's willingness to participate in tree planting followed by lack of seedlings, maintenance could be difficult and no land space for planting.

KEYWORDS: Urban, Trees, Forestry, Makurdi, Metropolis and Households.

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### I. INTRODUCTION

The majority of humans now livein urban environments and both urban area and population size are projected to increase [1], creating a pressing need to understand ecological processes within cities. Studies show that despite increasing urbanization, its potential impacts on community assembly of organisms, biodiversity, and ecosystems were the least studied in a recent review of over 11,500 assemblages[2] and these led us to understand that the study of the ecosystem of our environment is given a less concerned attitude. These include urban park systems, natural areas, and street trees, as well as the trees around residences. All vegetation, including trees, shrubs, and ground cover that grows on undeveloped land, is part of this urban forest. Assessment of an urban forest can be performed to estimate the environmental benefits and ecosystem services provided, thus improving our understanding of the role trees play in creating healthy livable and sustainable cities [3].

An urban Forest is a collection of trees that grow within a city, town or suburban area [4]. Trees in urban areas provide numerous benefits such as public aesthetic appeal, the roots of trees prevent erosion, trees improve air quality, serve as raw material for the wooden industries, preserve water shade, trees improve air quality, serve as a windbreak, shelter belt, protect water flow, sequence carbon, ameliorate harsh weather conditions, serves as recreational centers for relaxation and home garden as food. The benefit of urban forest can create citizen awareness towards the values of urban forest within an area that is publicly owned forest, as well as provide a basis for management of such benefits.

Urban forest plans are developed for trees contained within cities and municipalities [5]. In an urban forest, one tree can be as important as the rest of the forest. They must preserve existing trees, plant new ones and maintain them to sustain the urban forest system. Trees and forests play significant roles in protecting the

environment. We are rapidly losing these resources and must rethink the way we plan and build our communities to stop and eventually reverse this trend.

The removal of trees/forest covers and roots have a way for soil erosion to a disastrous extent. When a tree is cut down, the roots are removed, leaving the surrounding area susceptible to erosion. Trees reduce the effect of erosive forces using their root systems and foliage leading to desertification. Desertification occurs as the trees are cut down or removed. Tree roots hold the soil together. Once they are lost, the soil becomes loose, and then the top layer of soil might get washed away or blown with the wind. This top layer contains essential humus and nutrients for plants to grow. If there is no humus, the soil will become infertile and also no plants will grow. Forest still covers about 30 percent of the world's land area but they are disappearing at an alarming rate.

According to the World Bank, 502,000 square miles (1.3 million square kilometers) of forest were lost around the world between 1990 and 2016. An area larger than South Africa. we need trees for a variety of reasons, not least of which is that we exhale, but also the heat-trapping greenhouse gases that human activities emit. As those gases enter the atmosphere, global warming increases a trend, scientists now prefer to call climate change [6]. In addition, the planting and establishment of trees on degraded land, industrial waste or dunes can be an important step in soil rehabilitation and land reclamation. The roles played by forest cover are now becoming insufficient due to the enormous removal of the cover for a long time and not afforesting. In some countries loss of forest has gone on steadily over thousands of years and in others, it is a new occurrence.

Nigeria's population density is due to a combination of increasing growth rates and intensive migration from rural to urban areas, which has led to the destruction of urban forests and the development of social amenities, with urban centers having high It has become an attractive potential for migration [7].

Urban trees are now considered a central part of green infrastructure systems and offer many benefits. The main goal of urban forest management is to provide optimal and sustainable benefits for trees for current and future generations. To promote optimal sustainability, managers must understand current resources and their changes so that they can appropriately manage resources to a desired future state. Tree cover in urban areas has decreased in recent years [8].

Cities and towns of all sizes are increasingly recognizing the importance of coverage and the need for natural resource management planning [9]. The effects of past deforestation, the urgency of large-scale reforestation, and why reforestation is so important to protect land were considered.

## II. MATERIALS AND METHODS

# 2.1 Study area/Sample Size

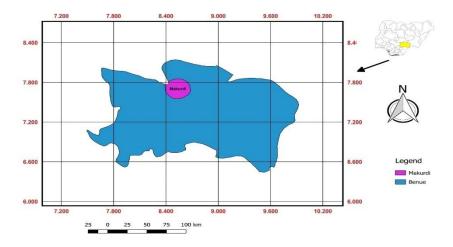


Figure 1. Map of Benue State, Showing Makurdi Local Government Area.

Six areas were randomly selected out of the areas in the Makurdi metropolis (see Figure 1), which includes North Bank, Wurukum, High-Level, Wadata, Modern Market and Kanshio and out of the areas selected, hundred and eighty (180) individuals were interviewed from different households as shown in Table 1.

Table 1: Determination of sample size for the Study Area

S/No	Area	Number of Respondents in an area F	Percentageof respondents in an area to the total number of respondents
1	Modern market	29	16.1
2	Wadata	31	17.2
3	North-Bank	29	16.1
4	Wurukum	30	16.7
5	High-Level	31	17.2
6	Kanshio	30	16.7
	Total	180	100.0

n=the total number of respondents participating in urban forestry in the study area.

#### 2.2 Instrument/Material

A structured questionnaire was constructed. The questionnaire consists of an introduction and four sections labelled (A to D). Section A sought to obtain information on the bio-data of the socioeconomic characteristics of respondents. Section B sought their response towards tree species used for Urban Forestry Practice in the Makurdi metropolis. Section C sought participation in Tree planting activities in Makurdi Metropolis and section D sought the factors influencing people's willingness to participate in urban tree planting and maintenance in Makurdi Metropolis.

#### 2.3 Method of Data Collection

The researchers visited the sampled areas personally. The people in the areas were interviewed face to face. At each house hold, one adult was randomly selected and interviewed. The questionnaire in each household over promptly filled and returned to the interview.

#### 2.4 Method of Data Analysis

Statistics such as mean, frequency and percentages will be used to describe the socioeconomic characteristics of the people in Makurdi metropolis. Statistics such as mean, frequency and percentages will be used to describe the tree species used for urban forestry practice in the Makurdi metropolis. The tree species will be ranked to ascertain the most preferred species used for urban forestry practice in the area. Participatory Index (PI) will be utilized in assessing the participation of the people in urban forestry practices in Makurdi metropolis.

The PI is expressed as:

 $PI = [(f_a*1+(f_o*0.8)+(f_c*0.6)+(f_r*0.4)+(f_n*0.2)]/N$ 

Where, PI = Participatory index for urban forestry practice

f<sub>a</sub> = frequency of respondent always participating in urban forestry

 $f_o$  = frequency of respondent often participating in urban forestry

 $f_c$  = frequency of respondent occasionally in urban forestry

 $f_r$  = frequency of respondent rarely participating in urban forestry

 $f_n$  = frequency of respondent never participating in urban forestry

N = Total number of respondents participating in urban forestry in the study area.

The value of PI can be interpreted on a scale of 0 - 1, where zero implies people have no chance of participating and 1 means always participating. Increase in values from 0 - 1 implies increase in participation level of the people in deforestation of the area.

The socio-economic factors influencing influencing the people's willingness to participate in urban tree planting and maintenance in the study area will be analyzed using the Binary Logistics Regression (BLR) model:

The BLR analysis is expressed as:

 $logit(y)=a+b_1x_1+b_2x_2+b_3x_3+...+b_nx_n+e$ 

Where y= dependent variable (binary variable); y=1, willingness of the people to participate in urban forestry, y=0 if otherwise.

a= Constant of the equation

 $b_1...b_n$ = coefficient of the independent variables

 $x_1-x_n$ = Independent variables, e = is a mathematical constant used as the "base" for natural logarithms

 $X_1$ = Age of the people (Scale variable)

X<sub>2</sub>= Years of schooling of the farmers (Scale variable; Non formal=1. Primary=6, Secondary=12 and Tertiary = 17 years)

 $X_3$ = Years of residence in the locality (scale variable)

X<sub>4</sub>= Annual Income (scale variable)

X<sub>5</sub>= Household size

 $X_6$ = Awareness of the importance of trees

X<sub>7</sub>=marital status

#### III. RESULTS

# 3.1 Socio- economic characteristics of the people practicing urban Forestry in Makurdi Metropolis

The results of the respondent's characteristic as presented in Table 2 revealed that 36.7% of the respondents with the age class of 21-31 were the highest, while 6.7% of the respondents with the age class of <20 was the least. 56.1% Of the respondents were male while 43.9% of the respondents were female. Majority of the respondents were farmers and civil servant with 30.0% while the least is timber dealers with 1%.

Table 2: Socio-Economic Characteristics of the People Practicing Urban Forestry in Makurdi Metropolis

S/No	Characteristic	Category	F(n=180)	Percentage
1.	Sex	Male	101	56.1
		Female	79	43.9
2.	Age Category (years)	<20	12	6.7
		21-30	66	36.7
		31-40	52	28.9
		41-50	33	18.3
		>50	17	9.4
3.	Occupation	Civil Servant	54	30.0
		Farmers	54	30.0
		Traders	30	16.7
		Timber Dealer	1	0.6
		Others	41	22.8
4.	Educational Status	Primary	24	13.3
		Secondary	86	47.8
		Tertiary	53	29.4
		Informal	17	9.4
	Marital Status	Married	91	50.6
		Single	66	36.7
		Divorced	7	3.9
		Widowed	16	8.9
	Family Size Category	<5	50	27.8
		5-10	108	60.0
		11-15	16	8.9
		>15	6	3.3
	Mean Age (Years)	35±11.074		
	Estimated Annual Income (Naira)	1-500 000	0	0.0
		501 000 - 1 000 000	125	68.4
		1 100 000 -2 000 000	30	16.9
		2 100 000 - 3 000 000	17	9.7
		3 100 000 - 4 000 000	4	2.3
		4 100 000 - 5 000 000	5	3.0
	Mean Annual Income (Naira)	979892.78±994 151.179		
	Family Size	6.15±3.288		
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Source: Field Survey, (2019).

## 3.2 Tree Species found in Makurdi Metropolis:

As shown in Table 3, most of the trees are sighted around houses and along roads. *Moringa oleifera* was the highly planted tree in the study area with 625% followed by *mangifera indica and Delonix regia* with an average of 37.8% and *polyalthia longifolia* with 7.2% is the least planted by the respondents.

Table 3: Tree species found in Makurdi Metropolis

S/No	Trees' Common Names	Scientific Names	Families	F(n=180)	%
1.	Moringa tree	Moringa oleifera	Moringaceae	1125	625
2.	Mango tree	Mangifera indica	Anarcardiaceae	68	37.8
3.	Flamboyant tree	Delonix regia	Fabaceae	68	37.8
4.	Neem tree	Azadiracta indica	Mediaceae	50	27.8
5.	Coconut tree	Coco's nucifera	Arecaceae	43	23.9
6.	Orange tree	Citrus sinensis	Rutaceae	30	16.7
7.	Guava	Psidum	Myriaceae	25	13.9
8.	Pawpaw	Carica papaya	Caricaceae	23	12.8
9.	Palm tree	Elaesis	Palmae	20	11.1
10.	Masquerade tree	Polyalthia longifolia	Annonaceae	13	7.2

Source: Field Survey, (2019).

# 3.3 The participation of the people in tree planting activities in Makurdi Metropolis:

Results of the analysis as seen in Table 4 show low participation of people in tree planting(p<0.05) among Households in Makurdi Metropolis.

Table 4: The participation of the people in tree planting activities in Makurdi Metropolis

Frequency	fa	$\mathbf{f_o}$	f <sub>c</sub>	$\mathbf{f_r}$	f <sub>n</sub>	N	PI
Participation	9(0)	2(8)	53(0.6)	41(0.4)	48(0.2)	180	0.38

Source: Field Survey,(2019). The PI is expressed as:

 $PI = [(f_a*1)+(f_o*0.8)+(f_c*0.6)+(f_r*0.4)+(f_n*0.2)]/N$ 

# 3.4 Factors influencing participation in urban tree planting and maintenance in Makurdi Metropolis:

As revealed in Table 5, it explains the factors influencing the people's willingness to participate in urban tree planting and maintenance in Makurdi Metropolis. 17.8% show time factor,5.00% cannot obtain seedlings, 6.10% have no sufficient land to plant trees and 1.70% show that maintenance could be difficult.

Table 5: Factors influencing the people's willingness to participate in urban tree planting andmaintenance in Makurdi Metropolis

Characteristic	Reasons	F(n=55)	%
Indicate your reason for your unwillingness to participate in tree planting project	Time factor	32	58.2
	Cannot obtain seedlings	9	16.4
	No sufficient land to plant trees	11	20.0
	Maintenance could be difficult	3	5.5

**Source:** Authors' field survey,(2019).

#### 4.5 Relationship between study area and the levels of participation of people in tree planting.

The Kruskal-Wallis H test used in testing for the significant difference between the study area and the level of participation of people in tree planting is shown in Table 6. It shows that revealed that the respondents have trees planted around their residents and there is no significant difference between the respondents participating in tree planting and the area studied (p>0.05)

Table 6: Kruskal - Wallis H -Test (H) test the difference between study area and the levels of participation of people in tree planting.

Kruskal-Wallis Test Variable	H-test	DF	P-value decision
Level of participation of the people in tree planting vis	1650	5	0.895
area			

Source: Field data,(2019).

#### 3.6 Relationship between gender and the level of participation of people in tree planting.

The Mann-Whitney U test used to test for significant difference between sex of the respondents and their level of participation in trees planting as presented in Table 7. There was no significant difference (P<0.05) between gender and the level of participation of people in tree planting.

Table 7: Mann-Whitney U Test (U) test the difference between gender and the level of participation of people in tree planting.

Mann-Whitney Test Variable	U-Test	P-Value
Level of participation of the people in tree	3720.500	0.369
planting vis gender		

#### IV. DISCUSSION

#### 4.1 Demographic characteristics of the people in the study area.

From the results as presented in Table 2, males and females have the percentage of 56.1 and 43.9, this shows that there's not much difference between gender in the Practice of Urban Forestry. Although some studies [10] and [11] observed that men are more involved in livelihood activities than women, in this study, there were no major differences between males and females in the identification of their major livelihood activities. Those with secondary education were more as presented in the Table 2, this is in line with [12] it was found that education affects awareness of rules and regulations. [13] found that well-educated communities understood better the benefits of conserving trees.

Some studies [14] and [15] show that education influences dependency on forests. These studies indicate that education increases income-earning opportunities. Education also affects attitude towards conservation as demonstrated by [16] and [17]. Agreeing to these considers, individuals with higher instruction have a positive state of mind to preservation whereas those with moo instruction tend to have a negative. However, some studies find a negative correlation between attitude and higher education [18]. 30.0 percent of the respondents were farmers and civil servants as presented in (Table 2) meaning that, farming and the attitude of the civil servants are the major occupations that affects urban forestry in the study area. This explains the annual income of the respondents which is of the mean estimated income of \$\frac{1}{2}\$979,892.78. Findings from this study may be instructive also for those features that showed no statistically significant differences of opinions, such as respondents' age, family size and type of employer. This information alone may well be valuable to any future urban ranger service endeavors inside the State.

#### 4.2 Tree species found in Makurdi Metropolis.

The study has shown that the study area is rich with different tree species identified as urban trees. Many of these trees are located in the respondents' compound, around their houses, neighbourhoods and places of work. According to the Council of Tree and Landscape Appraisers, [19], well-maintained landscapes can contribute up to 20% to the value of an improved residential property." Moringa oleifera and Mangifera indicahave been grown by a greater number of the population. In developing countries, people grow trees for materials such as firewood, fruits and timber at local scale. Over time, each city and region may manage its urban forest for an increasingly broader range of benefits. [20] opined that in defining the bounds of urban forestry as a discipline, it is important to consider the current developmental needs of a population as they establish urban forestry goals most suited to their city's social, economic and geographical context. As noted by [21], tree planting and management can be used to stabilize soils, reduce erosion, prevent floods, reduce particulate air pollutants and improve groundwater recharge. Urban trees and woodlands are known to provide a wide range of environmental, economic and social benefits to those who live and work in towns and cities. Urban trees require cautious determination, planting and foundation in case they are to create into a solid and dynamic urban timberland that will convey these environment administrations.

#### 4.3 The participation of the people in tree planting activities in Makurdi Metropolis.

From the data obtained from the Participatory index for urban forestry practice, there was low participation of people in tree planting(p<0.05) among Households in Makurdi Metropolis. Kruskal-Wallis H-Test reveals that there was no significant difference between the areas of study and the level of participation in the tree planting. This shows that the planting of trees is in with the environment and the attitude of the people in the area. As opined by [22], residents' attitudes towards trees are likely to be one of the most important factors deciding the presence or absence of trees in a given area. Mann-Whitney U Test reveals that there was no significant difference between gender and the level of participation in tree planting, therefore, those who did not participate in tree planting were the result of tangible reasons and some were that they did not like trees. This is in line with Christian [22], Those who do not like trees may live in areas with no trees, and would not support or take part in greening programme. Previous studies suggest that people are generally positive towards trees regardless of their socioeconomic background, want to see more trees planted and would pay for their upkeep to ensure they are not removed from cities.

# 4.4 Factors influencing the people's willingness to participate in urban tree planting and maintenance in Makurdi Metropolis.

Time factor was the more challenging factor for not planting trees followed by not being able to obtain seedlings, no sufficient land to plant and then maintenance could be difficult. Time factor and Lack of adequate funding for tree maintenance was the most commonly cited challenge to achieving the goals of the tree-planting program for TGD staff and board members. [22]. These explained the Kruskal-Wallis H-Test results. However, many within TGD acknowledged the challenges associated with the long-term maintenance of city trees and expressed a desire to more meaningfully engage with residents. This reflects the principles of community forestry [23]. In projects that require farmers to opt in, typically only some farmers in the community participate, and not all farmers will be willing or able to participate equally [24]. Giving these reasons as factors that limit them from planting trees, [25] surmise that because citizens have reservations about urban trees, they are therefore not going to be reliable partners because the assumption is that they are not concerned about or aware of the environmental benefits that trees provide.

#### V. Conclusion

The results of this research reveal the following: the most used tree species in the study area, their socio-economic characteristic, factors limiting them from tree planting and the participation of people in tree planting and the benefits. The socioeconomic characteristics of the respondents review not much statistically significant difference such as opinions and can be useful for any future planning of urban forestry. There are different tree species in the study area located around the respondent's houses, neighbourhoods, and places of work. From the data obtained from the Participatory index for urban forestry practice, there was low participation of people in tree planting (p < 0.05) among Households in Makurdi Metropolis. Some people are not willing to plant a tree due to many factors especially time factors and inadequate seedlings but it does not bridge the fact that they know the importance of trees and how appreciative they are of the trees around them.

#### VI. Recommendation

- i. There should be an increase or improved management and conservation of trees by establishing a tree management committee in Makurdi who will be in charge of maintenance and care of street trees, organising tree planting programs, Planning, development and management of urban forests and it should be community-based.
- ii. Seedlings should be made available for any individual or group that is interested in having trees around their houses or buildings as a form of encouragement.
- iii. Survey of tree preference when planning for a tree planting program or project. This is most important in residential areas where the fate of the survival of the trees will be determined by the residents living close to them.
- iv. Planting of other vegetation or plant species should be encouraged for those having little space.
- v. Forests and trees baseline data at the community level should be captured and monitored on a regular basis.

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#### REFERENCES

- [1] United Nations, (2014). World Urbanization Prospects: The 2014 Revision, Department for Economic and Social Affairs, United Nations, New York, USA.
- [2] Newbold, T., et al., (2015). Global effects of land use on local terrestrial biodiversity. Nature 520.7545, pp. 45-50.
- [3] Gunwoo K., (2016). Assessing Urban Forest structure, Ecosystem Services, and Economic Benefits on Vacant Land.
- [4] Ranasinghe, W. C. &Hemakumara, G.P.T., (2018). Spatial modelling of the house holders' perception and assessment of the potentiality to improve the urban green coverage in residential areas: A case study from Issadeen Town Matara, Still Lanka, Ruhuna journal of science, 9(1). <a href="https://rjs.ruh.ac.|k|index.php|rjs|article|view|174">https://rjs.ruh.ac.|k|index.php|rjs|article|view|174</a>.
- [5] James, W.N. S., Peter, N. D., & John, D. C., (2013). The neighborhood approach to urban forest management: The case of Halifax, Canada. Landscape and Urban Planning, (117) 135-144, <a href="https://doi.org/10.1016/j.landurbplan.2013.04.003">https://doi.org/10.1016/j.landurbplan.2013.04.003</a>.
- [6] Christina N. (2019). Deforestation facts and information National Geography, www.nationalgeographic.com.
- [7] Aladesanmi D. A., Jonathan C. O., &Oluwaseun A. (2016). Assessment of urban forest Tree species population and Diversity in ibadan, Nigeria, Department of Forestry, Ekiti State University Nigeria.
- [8] Nowak, D.J., & Greenfield, E.J. (2012b). Tree and impervious cover change in U.S. cities. Urban Forestry and Urban Greening. (11): 21–30.
- [9] Michael, L. (2016). Davey institute/USDA forest service USFS Philadelphia
- [10] Ceppi, L.S., & Nielsen, R.M. (2014). A comparative Study on bush meat consumption patterns in ten tribes in Tanzania. *Tropical Conservation Science* 7(2), 272-287.
- [11] Van V. N., (2012). Livelihood alternatives for the unsustainable use of bush meat. CBD Technical series 60. Convention on Biological Diversity.
- [12] Keane, A. Ramarolahy, A. A., Jones, J.P.G., & Milner-Gulland E.J. (2010). Evidence for the effects of environmental engagement and education on knowledge of wildlife laws in Madagascar. <a href="https://doi.org/10.1111/j.1755-263X.2010.00144.x">https://doi.org/10.1111/j.1755-263X.2010.00144.x</a>
- [13] Nkonye E., Pender, J. K., E., Mugarura, S., &Muwonge, J. (2008). Who knows, who cares? The determinants of Enactment, Awareness and Compliance with Community Natural resource Management in Uganda. *Environment and Development Economics* 13(1):79-101
- [14] Wambua S. 2008. An Economic Analysis of Forest Extraction and Its Link to Community Livelihood: The case of Kakamega rainforest. MSc Thesis.
- [15] Adhikari, B., Di Falco, S., & Lovett, J. C. (2004). Household characteristics and forestdependency: Evidence from common property forest management in Nepal. Ecological
- [16] Romañach, S.S., Lindsey, P.A., & Woodroffe, R. (2007). Determinants of attitudes towards predators in central Kenya and suggestions for increasing tolerance in livestock dominated landscapes. Oryx. 41, 185-195.
- [17] Tomic evic', J., Shannon, M.A., & Milovanovic', M. 2009. Socio-economic impacts on the attitudes towards conservation of natural resources: Case study from Serbia. Forest Policy and Economics. 12, 157-162.
- [18] Gadd, M. E., (2005). Conservation outside of parks: attitudes of local people in Laikipia, Kenya. Environmental Conservation. 32, 50-63.
- [19] Council of Tree and Landscape Appraisers. (2000). Guide for Plant Appraisal (9<sup>th</sup> ed.). International Society of Arboriculture. Champaign, IL. 143 pp.
- [20] Babalola, F.D. (2010). Issues and option for appropriate management strategies of campus tree at university of Ibadan, Nigeria. Nigerian Journal of Ecology. 11:33-42
- [21] Daly, H.E., & Farley, J. (2011). Ecological Economics: Principles and Applications; Island Press: Washington, DC, USA.
- [22] Christian, E. (2017). The trouble with trees? Social and political Dynamics of greening efforts Detroit, Michigan
- [23] Pagdee, A., Kim Y. & Daugherty, P. J., (2006). What Makes Community Forest Management Successful: A Meta-Study from Community Forests Throughout the World, Society & Natural Resources, 19:1, 33-52, doi: 10.1080/08941920500323260.
- [24] Pattanayak, S.K., Mercer, D.E., Sills, E. & Yang, J.C. (2003). Taking stock of agroforestry adoption studies. Agroforestry Systems, 57, 173-186.
- [25] Conway, T. M., & Bang, E. (2014). Willing partners? Residential support for municipal urban forestry policies. Urban Forestry and Urban Greening, 13(2), 234–243.