
URBAN FOREST PARK AS ECO-SPACE FOR LIVEABLE CITY: ARROCEROS FOREST PARK, MANILA, PHILIPPINES

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Abstract

The Arroceros Forest Park (AFP), located at the transportation hub of Manila, is one of the remaining urban forests parks in Metro Manila. As a 2.2-hectare green space it contains different varieties of trees and plants, and considered as the “last lung” of the city of Manila (Roces, 2007). However, most of urban forest parks, accessible to students and work place are not politically prioritized (Chiesura, 2004), thus the objective of the study is to understand how collaborative management of interest groups sustain AFP and raise awareness on the importance of Urban Forest Park as eco space among urban residents in promoting social and emotional well-being. Anchored on the concept of eco-space in creating liveable city (ADB, 2012), the paper argues that more attention should be given to forest parks as they mitigate climate change and provides well-being of urban residents. AFP is home to some migratory bird species, is also used as venue for recreational activities of some civil society organizations. The study used qualitative and quantitative methods to determine how institutions and interest groups protect the forest park as an eco-space in Manila. Results show that AFP is managed and maintained by Winner Foundation, a non-government organization in collaboration with the Department of Public Service of the city government of Manila. It is a gated public green space and the lot area is shared with a city government office. Its location a stone throw from the Manila City Hall, not popularly known among the urban residents and students. Though supported by civil society organizations, urban residents are not aware of its ecological value and importance in creating liveable cities. In conclusion, there is a need to strengthen collaboration between the local government and private sector to sustain this eco space as a key to urban quality life and mitigation strategy against urban problems.

Keywords: *Arroceros Forest Park, eco space, sustainability, and collaboration.*

1.0 INTRODUCTION

Cities are increasing and expanding as population increases through time. Many of these cities are being confronted with congestion, pollution, and spatial scarcity but they also serve as engines of opportunity and creativity (Cunningham, 2015). Due to increasing congested cities all over the world, people’s well-being is at stake. One of the priority areas of the United Nations Sustainable Development Goals (UNSDGs) is to promote society’s well-being. According to the UNSDGs

(2015), by 2030, countries are expected to impart universal access to safe, inclusive and accessible, green and public spaces particularly to the vulnerable sectors like children, women, elderly and persons with disability in the society. In order to accomplish this goal especially in the urban area, experience to different green spaces or urban forest must be prioritized.

Aspiring to achieve the concept of “liveable” in a city is a vital concern. Globally, cities account for about 70% of CO₂ emissions, which comprise a significant share of global greenhouse

gas emissions, the bulk of these being generated in the building and construction, urban transport, and energy sector (Chandler, 2012). Thus liveable city is achieved by the use of renewable energy, walkability, green building and eco spaces among others. The concept of liveable city is utilized to identify the idea of development as an enhancement of the quality of life and characterized with social habitat and physical well-being (Douglass, 2002). It is also typified with parks that indicate local strength and uniqueness (Gore, 1999) and suggests an option and diversity in the variety of amenities available to people who live and work in the community (Wheeler, 2013).

This study illustrates that urban forest park, an essential component of eco city (ADB, 2012) or liveable city promotes people's well-being. Anchored on the concept of eco space (ADB, 2012), the paper illustrates that urban forest is an essential part of the urban ecosystem that provides ecological services to urban residents. As an eco-space it invokes built environment, open spaces, and at the same time minimizes resource use and urban problems (ADB, 2012). As a green space it stabilizes the emotional and psychological conditions of the people amidst urban problems of pollution, congestion and climate change.

2.0 CONSTRUCTING URBAN FOREST PARK AS ECO SPACE

The most broadly accepted definition of urban forestry, according to Miller (1997) is 'the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic and aesthetic benefits trees provide society' (Helms, 1998). This definition already makes it clear that urban forestry is more than just 'forestry' in (or near) urban areas.

Many urban foresters in industrialized countries use the terms "urban greening" and "urban forestry" interchangeably (e.g. Miller, 1997). The broadest definitions regard urban forests as the entire forest area influenced by the urban population. In a more restricted sense, urban forestry relates to trees and woodland in towns and cities: garden and farm trees, street and

park trees, remaining woodlands and emerging woodlands on vacant and derelict land. In industrialized countries urban forestry has focused on amenities and environmental benefits (Miller, 1997; Nilsson & Randrup, 1997).

Studies show that the presence of Urban Forest Park as an essential part of the city environment has many positive effects to urban residents. Barton et al. (2016) stated that an exposure to the nature could develop the children's cognitive performance and well-being. This kind of experience can also lessen psychological and physiological stress and may result to a better self-reported health (Barton et al., 2016). Interestingly, Wolsko & Lindberg (2013), Nisbet et al. (2011) and Mayer & Frantz (2004) revealed that low level of connection with nature during childhood years could be identified across the life course and have a disadvantageous effect on the future health of the individual. The low level of contact with forest and green spaces could also have an unfavourable effect on the well-being of a person (Pretty et al., 2009; Ward Thompson, Aspinall, & Montarzino, 2008).

Capaldi, Dopko, & Zelenski (2014), Howell et al. (2011), Mayer et al. (2009), and Baumeister & Leary (1995) argued that a link established to the nature has also been found to be associated with a number of different elements of psychological health and well-being among adults. Also, connection to nature is considered to be effective in enhancing well-being and may also increase the happiness of the person (Barton et al., 2016). Creating a bond between the nature and the well-being of an individual is reconciled by the effectiveness of a forest in an urban area. Establishing a connection to nature is a significant predictor of subjective well-being and ecological behavior (Zelenski & Nisbet, 2014; Wolsko & Lindberg, 2013; Mayer & Frantz, 2004) and could facilitate the younger generations to widen the connection with the natural world, which will in turn improve their health (Bratman et al., 2012). The official site Shinrin-yoku succinctly claimed that connection to a forest could also serve as a form healing process and relaxation.

Figure 1 is the conceptual framework illustrating urban forest part as ecological space promoting the well-being of the people for liveable city.



Figure 1. Illustrating the relationship of Urban Forest Park as eco space, roles and responsibilities of social actors, in promoting the well-being of the residents and creating a liveable city

The framework has three components. The first component is to construct the forest park as an ecological space. As an ecological space, it provides oxygen and absorbs carbon dioxide, creates an ambiance of green space that promotes the emotional needs and social well-being of the urban residents. The main goal of the ecological space is to promote the well-being of the city. It needs a lot of collaborative management for an urban forest to be sustained as it is not a priority of the local government. To sustain a forest park is costly and does not generate income for the city coffers.

The paper argues that more attention should be given to forest parks as they mitigate climate change and provides therapy for urban residents. AFP also serves as home to some migratory bird species and used as venue for recreational activities of some civil society organizations.

3.0 RESULTS

The researchers used mixed methods to have a better understanding of the community's valuation of the said forest park. John (2015) defines the method as an approach in which investigators gather both quantitative and qualitative data, integrates the two and draws interpretations based on the combined strengths of both sets of data to understand research problems.

3.1 Study Area

Arroceros Forest Park (AFP) is one of the remaining urban forests in Metro Manila. It is located in the heart of the public transportation hub in Manila, and adjacent to the Pasig River. Located in Barangay 659-A in the 5th district of Manila, and on the rear side of Metropolitan Manila Theatre and is just a stone throw away from the police station and few meters away from the city university area but not visible from the main road. It is a gated urban forest park with two gates and a high wall in between. According to the Profile of Barangay 659-A (January 1, 2015), the barangay has a total population of 1,518 with 320 households. The range of the Barangay 659-A is seen in Figure 2.



Figure 2. Map of Brgy 659 – A with Arroceros Forest Park map created from GIS
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3.2 Research Instrument

The methods used to determine the views and frames of the stakeholders in managing the urban forest are: 1) key informant interview of NGOs, interest groups and stakeholders who are working directly with the AFP; 2) transect line to view the tree species in the 2.2 hectare big secondary forest and 3) review of written materials provided by the Wild Bird Club of the Philippines; internet sources; DENR documents to validate how institutions and interest groups protect the forest park as green space in Manila.

Quantitatively, this study adapts the analysis of Alex and Lim (2010) which stated that preference approach is an economic technique to estimate the monetary value of non-marketed goods such as Urban Green Space (UGS), wherein the Arroceros Forest Park will be the researchers' locale. The approach directly inquired the people from the community, about the value they have to the said UGS and carefully designed an experimental questionnaire. Contingent valuation method (CVM) has been used as a basis of our environmental analysis. The study used a 7-point Likert scale, to determine the level of affirmation to the different concepts concerning the importance on the said forest park. On the later part of the analysis, the study applies Logistic Regression to show the relationship of the dependent variables to the independent variables.

Logistic regression on the other hand is a special form of regression which is used in determining the impact of independent variables with dependent variables that has binary responses. ($Y_i=1,0$) Since there are only two possible answer in analyzing logistic regression, the mean response would be $E(Y_i) = 1 \times p_i + 0 \times (1-p_i) = p_i$. Thus, the results that we may derive could be interpreted as the probability that $Y=1$ when the regressor variable is X_i . On the book of Gujarati (2004), mentioned that a logit model could be represented like the equation listed below:

$$P_i = E(Y = 1|X_i) = \frac{1}{1+e^{-(\beta_0+\beta_1X_1)}} \quad (\text{Equation 1})$$

This equation represents what is known as the (cumulative) logistic distribution function. It could also be represented by the equation below:

$$P_i = \frac{1}{1+e^{-Z_i}} = \frac{e^z}{1+e^z} \quad (\text{Equation 2})$$

It is easy to verify that as Z_i ranges from $-\infty$ to $+\infty$, P_i ranges between 0 and 1 and that P_i is nonlinearly related to Z_i (i.e., X_i). But it seems that in satisfying the requirements of an OLS estimation, have created an estimation problem because it is nonlinear not only in X but also in the β 's as can be seen clearly from equation 3.1. This means that the familiar OLS procedure cannot be used to estimate the parameters. But this problem is more apparent than real because Equation 1 can be linearized, which can be shown as on the equation below:

$$1 - P_i = \frac{1}{1+e^{Z_i}} \quad (\text{Equation 3})$$

And therefore we can write:

$$P_i = \frac{1}{1+e^{-Z_i}} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i} \quad (\text{Equation 4})$$

Now $P_i/1-P_i$ is simply the odds ratio in favour of having a yes—the ratio of the probability that the researcher will get a yes to the probability that will get a no. In turn, it will be needed to get a natural log like the equation seen below:

$$L_i = \ln \frac{P_i}{(1-P_i)} = Z_i = \beta_0 + \beta_1 X_1 + u \quad (\text{Equation 5})$$

The equation above shows L_i , the log of the odds ratio, is not only linear in X , but also (from the estimation viewpoint) linear in the parameters. L_i is called the logit, and hence the name logit model for models like the one seen on equation 3.5. The logistic regression model of this research could be seen below:

$$L_i = \frac{P_i}{(1-P_i)} = \alpha + \beta_1 \text{Age}_1 + \beta_2 \text{HMI}_2 + \beta_3 \text{Educ}_3 + \beta_4 \text{Gend}_4 + \beta_5 \text{HHM}_5 + \beta_6 \text{Year}_6 + \beta_7 \text{Dep}_7 \quad (\text{Equation 6})$$

Where:

Y_1 = Option value

Y_2 = Existence value

Y_3 = Bequest value

Age = Age of the respondent

HMI = Household's monthly income

Educ = Education of the respondent

Gend = Gender of the respondent

HHM = Household Members
Year = Years of residence of the respondent to
Brgy 659 – A Zone 71
Dep = Household's number of dependents (if
applicable)

Qualitatively, this study entails structured interviews of the respondents that are citizens of the community where the Arroceros Forest Park (AFP) is located. The researchers opted to ask the head of every household, who are considered members of the community. To eliminate bias on the answer of every respondent, the sampling employed in this study is multistage sampling method, since the community is a primary group and to ensure that the answer of one household, would not affect the decision of another respondent. First stage is clustered random sampling.

According to Calmorin et al. (2007) cluster sampling is a scientific sampling design in which the population is grouped into clusters or small units. The basis of the values on the clustered random sampling is the number of households given by January 2015 census of the barangay. The second stage is a systematic and purposive random sampling which is based on the clustered sample initially computed, to ensure that there is no bias on the data. The respondents have a screener question to ensure that they are part of the population that the researchers wanted and written in the official Filipino language (*Tagalog*). All the respondents have the following characteristic: (1) head of the household¹ (2) been staying in Brgy 659 – A Zone 71 for more than a year and (3) a registered voter of the barangay.

4.0 METHODOLOGY

Out of 100 potential respondents from the said barangay, a total of 64 questionnaires were successfully completed with a face-to-face interview in several areas of barangay. This is with the help of the barangay officials and the students from the Philippine Normal University.

¹Head of household is defined by the researchers as the member of the family that is in charge of the decision making. They are the qualified respondents of the study,

As seen on the results, most of the respondents are female and age are ranging from 21 to 40 years old. It also shows that majority of the respondents have an income ranging from below 5,000 to 10,000. Majority of the respondents are high school graduate. Majority of the respondents also have a respondent have household members which are ranging from 3 to 6. More than half of the respondents also have been staying in the said area for more than 10 years, with dependents. Lastly, majority of the respondents were not able to enter the park. The total tally of the results from the said survey could be seen on Table 1.

The respondents were asked about their individual perspective on the importance of the Arroceros Forest Park. According to them, the trees must be protected while existing in the urban forest. Furthermore, the response also indicated their belief on the primordial responsibility of the community in the urban green space protection. The average scores of the people's response was reflected in Table 2, and it signified that majority of the people in the community gave a common notion that they need to maintain and protect the said forest park to safeguard its sustainability.

The reasons why the respondents give less value to the park are shown in Table 3. However, majority believed that trees should not grow in the urban areas but must be nurtured in their own habitat. This is to be followed by their perspective that AFP should be the responsibility of the government and the statement, that "the protection of the environment could not be measured by money". Despite the community's level of agreement to these statements, majority of the community still do not agree with the statement that "industrial progress is more important than protection of trees" and "AFP could be replaced by buildings to be more useful". This could testify that the urban forest is important to them, despite the industrialization in Manila.

because their valuation on the park may also be the valuation of the whole household, considering the nature of the Filipino family.

Table 1. Respondent’s socio economic characteristic

Socio-economic variables	Categories	Survey (%)
Gender	Male	20.3%
	Female	79.7%
Age Range	20 and below	7.8%
	21 to 30	28.1%
	31 to 40	29.7%
	41 to 50	14.1%
	51 to 60	7.8%
	60 and above	12.5%
Household income	5,000 & below	39.1%
	5,001 to 10,000	35.9%
	10,001 to 15,000	4.7%
	15,001 to 20,000	9.4%
	20,001 to 25,000	1.6%
	25,001 and above	9.4%
Educational Attainment	Not educated	1.6%
	Elementary Level	17.5%
	Elementary Graduate	4.8%
	High School Level	19.0%
	High School Graduate	9.5%
	College Level	27.0%
	College Graduate	17.5%
Post Graduate	3.2%	
Members of Household	1	12.5%
	2	3.1%
	3	15.6%
	4	20.3%
	5	18.8%
	6	12.5%
	7	6.3%
	8	6.3%
	11	1.6%
	12	1.6%
16	1.6%	
Years of Residence	More than 1 year	7.8%
	1 to 2 years	15.6%
	3 to 4 years	6.3%
	5 to 6 years	7.8%
	7 to 8 years	4.7%
	9 to 10 years	4.7%
More than 10 years	53.1%	
Number of Dependents	Yes	62.5%
	No	37.5%
Were you able to enter the park?	Yes	67.2%
	No	32.8%

Table 2. Respondent’s motivations for the maintenance of the urban forest park

Motivations for the maintenance of the said urban forest	Average Score	Rank
The trees in AFP should be protected	6.31	1
The community needs more Urban Green Space to beautify the environment.	6.30	2
Maintenance of AFP is my responsibility to the environment	6.20	3
Our place needs more trees for recreational and social activities	6.16	4
Helps in pollution mitigation.	5.98	5
AFP helps widen scientific and social knowledge	5.61	6
AFP helps other residents	5.56	7
AFP could be a tourist spot	5.53	8

Table 3. Respondent’s motivations for not maintaining of the said urban forest

Respondent’s motivations for not maintaining of the said urban forest	Average Score	Rank
Trees exist on their own rights and should not be planted in urban areas	5.97	1
AFP should be the responsibility of the government	5.81	2
The protection of the environment could not be measured by money	5.72	3
Industrial progress is more important than protection of trees	3.30	4
AFP could be replaced by buildings to be more useful	3.23	5

4.1 Community’s Value and Willingness to Pay for AFP

The researchers also inquired if they find the forest park important in their community and 93.8% affirmed its importance to the community.

Majority acknowledged the fact that it is the only place in Manila, where you can find a lot of trees, but they all believe that it should be allowed to be utilized by the community as well. On the other hand, there was 89.1% of the community that does not want the forest park to be closed. The primary consideration of the respondents who favoured the park closure is the benefit that will be gained if the eco-space will be converted into a high-rise building. However, majority of the respondents still wanted to keep the park intact. They were also asked if they want the future generations to see the said forest park and 85.9% of the respondents affirmed the said question. The breakdown of its values could be seen in Table 4.

Table 4. Respondent's answer to questions in line with their valuation to the park

Question	Yes	No
Do you think, AFP is important in your barangay?	93.8%	6.2%
Do you want the government to close the said park?	10.9%	89.1%
Do you want the future generations to see AFP?	85.9%	14.1%

The researchers put three types of value: option value, existence value and bequest value. We started by asking them if they are willing to pay for the following reasons:

1. If the park will charge an entrance fee in before they could enter it. (Option Value).
2. If they are willing to pay so that the park would not be replaced by buildings or establishment. (Existence Value).
3. If they are willing to pay for the future generations. (Bequest Value).

Results show that majority of the community does not want the park to have an entrance fee, but they are willing to pay for the park not to be replaced by buildings/establishment and for the future generations to still see the said forest park. The breakdown could be seen in Table 5.

The values from Table 6 indicate that gender and number of child dependent strongly increases the option value of the community. Female have the highest inclination to pay for an entrance fee as opposed to male and, the people without

dependents are more willing to pay for the said forest park. On the other hand, increasing number of dependents also increases their willingness to pay, apparently, because the higher the dependents they have, the more likely that they are going to pay for the said forest park. Table 7 on the other hand would show us the factors that could affect the community's existence value.

To determine what gives them the willingness to pay in the said criteria mentioned, the logistic regression analysis was employed by the researchers. The results on Table 6 would show us the factors that affect their option value:

Table 5. Respondent's answer to questions in line with their valuation to the park

Question	Yes	No
1. Option Value	46.9%	53.1%
2. Existence Value	53.1%	46.9%
3. Bequest Value	64.1%	35.9%

Table 6. Logistic Regression of the factors affecting the Option Value

Option Value	Coefficient	Standard Error	z value
Constant	-3.587	1.754	-2.04**
Age	0.04	0.025	1.58
Household income	-0.184	0.22	-0.84
Education	0.252	0.877	1.33
Gender	-2.066	8.7697	-2.36**
Household members	0.279	0.1457	1.92*
Years of residence	-0.066	0.1523	-0.43
Child dependent	-3.587	1.754	2.04**

**Indicates that significant 0.05

*Indicates that significant at 0.10

Table 7 would show us that none of the variables would heighten their willingness to pay because the community has a varying motivation, regardless of the mentioned independent variable. Table 8 on the other hand would show the factors that would impact the bequest value or their willingness to pay for the future generations.

Table 7. Logistic Regression of the factors affecting the Existence Value

Existence Value	Coefficient	Standard Error	z value
Constant	-0.128	1.375	-0.09
Age	0.129	0.020	0.64
Household income	0.056	0.198	0.28
Education	-0.039	0.158	-0.25
Gender	-0.309	0.6468	-0.48
Household members	0.112	0.1078	1.05
Years of residence	-0.062	0.134	-0.46
Child dependent	-0.229	0.562	-0.09

Table 8. Logistic Regression of the factors affecting the Bequest Value

Bequest Value	Coefficient	Standard Error	z value
Constant	-3.412	2.069	-1.65*
Age	0.354	0.031	1.15
Household income	0.031	0.271	0.11
Education	0.122	0.199	0.61
Gender	-2.478	0.865	-2.86**
Household members	0.353	0.184	1.92*
Years of residence	-0.197	0.173	-1.14
Child dependent	1.563	0.782	2.00**

**Indicates that significant 0.05

*Indicates that significant at 0.10

The values from Table 8 shows same trend that is shown in option value. It shows that gender and number of child dependent strongly increases the bequest value of the community. Moreover, increasing number of dependents also increases their willingness to pay for the future generations.

4.2 Arroceros Forest Park, a Vanishing Forest Park in the City

The Arroceros Forest Park (AFP), located at the transportation hub of Manila is one of the remaining urban forests parks in Metro Manila.

As a 2.2-hectare green space it contains different varieties of trees and plants, and considered as the “last lung” of the city of Manila (Rivera, 2015).

However, most of urban forest parks, accessible to students and work place are not politically prioritized (Chiesura, 2004), thus the objective of the study is to highlight how collaborative management of the non-government organizations, advocacy groups, and few government agencies sustain AFP and raise awareness on the importance of urban forest park among urban residents in promoting social and emotional well-being.

Arroceros Forest Park is managed and maintained by Winner Foundation, a non-government organization in collaboration with the Department of Public Service of the city government of Manila. It is a gated public green space and the lot area shared with a city government office. Its location is just a stone throw from the Manila City Hall, but not popularly known among the urban residents and students. Though supported by civil society organizations, urban residents are not aware of its ecological value and as mitigation tool for climate change.

Arroceros forest park is a critical forest park in Manila. Using the “eco space” concept, the AFP has the potential of providing recreational space for the urban residents considering space scarcity in Manila. It has been the venue of NGOs activities catering to children and environmental advocates.

In the case of the AFP, the weekly presence of the Winner Foundation, scarce labourers and few volunteers to clean the forest park is not enough to be appreciated by the public. People in the barangay are not aware of the forest park. Students and workers around are not interested either. It is not even visible to the public eye.

5.0 CONCLUSION

The introduction and the integration of sustainable development in government, requires a great degree of consciousness, proposing solutions and developing appropriate tools to implement effective and efficient integration of sustainable development in public consciousness. The sustainable development term was coined to

indicate a system of development that promotes respect to the environment, it is a development which meets the needs of the status quo, without compromising future generations. The public in general reacts according to the laws, policies, and rules that govern the city where they reside. So to be able to apply significantly the maxims of sustainable development, policies and ordinances on environmental awareness and reciprocal duties and obligations should be effectively formulated, executed and implemented by the local government. A breakdown in the implementation and enforcement of environmental laws rules, and regulations will jeopardize the chances of a sustainable city.

Currently, the collaboration between the primary social actors are very limited and inexact, with the cooperation moving in isolation and each actor acting separately. Each actor must have a good awareness of sustainable development coupled with a full and clear knowledge of the 5 W's. Knowing exactly what they need to do, where the only urban forest park is present, when is the right time, why they need to sustain the Arroceros Forest Park and who is primarily responsible for certain tasks. There is an immediate need to educate local government policy makers on environmental development sustainability, establish an office monitoring and accountable for documents and needed actions for the maintenance and management of the AFP. An inter-actor dialogue and consultation must be constant and substantial. The community has little inclination on the environmental culture with the urgent need for evangelization and information as well as forewarning them of problems that aggravate their environment.

Urban centres typify the quandary between development and environmental impact. There is a strong support for urban development embodying social and economic growth overrides the resulting adverse environmental impact. The short-term benefit of this development is glaring while setting aside the long-term undesirable consequences. Urban development places emphasis on short-term benefits at the expense of lasting costs. This is the reverse of sustainable development. In contrast, the emphasis of sustainable development is placed on ensuring long-term net benefits that will accrue to future generations. In conclusion,

there is a need to strengthen collaboration between the local government and private sector, particularly the NGO and the Academe, to sustain this eco space as a key to urban quality life and mitigation strategy against urban problems.

6.0 RECOMMENDATION

The introduction of the CLAN concept portraying the main actors in the existence of an urban forest as component of a sustainable city is both integral and imperative. The CLAN stands for the Collaboration between the Local Government, the Academe and the NGOs. Defining their roles as the main actors would primarily play the most important and collaborative roles in ensuring that the only urban forest in the capital City of Manila, which is the Arroceros Forest Park, would be preserved, maintained and optimized in order to strengthen its existence as a differential component of Manila as a sustainable city. Their definitive functions are illustrated in the acronym SCARCE which stands for Shapers, Change Agents and Rebuilders of the Community and the Environment, thus representing the Government as the Shaper, the Academe as the Change Agents and the NGOs as the Rebuilders.

By linking government roles to NGO initiative responses to the community needs and resources and with the academe's beneficial role, the CLAN can exemplify a shared responsibility for the individuals, the community and the city in general. The impact of the CLAN concept and the SCARCE movement upon the development of the cities to which they belong is a significant one. In this collaboration level, the degree of exchange of information and resources between the three main actors, and the different powers and levels of authority should be explicit and well-designed.

The Local Government should invoke processes in which the people can advance their skills and cultivate capabilities to organize local sustainable communities, perform multifarious functions, address city issues and challenges, set and realize objective. Important institutions in the community like the NGO, with noble intention, can bridge such engrossment. The Academe provides several approaches to improve individual skills and awareness. They

recommend means for adaptation and commitment of the individual to the city's sustainability, thus making him a change agent.

The academe is a significant educational and social-honing institution. They perform roles that bring wider changes in the society. They have four-fold duties in developmental sustainability: they must, be keepers of universal values and guardians of their own city; while at the same time must contribute to the installation of political, social, scientific, environmental technological, economic, and cultural development of the society and of the people. They must inculcate to every individual as young as they are, the discipline of maintaining a liveable city and lastly, to let the entire population appreciate the benefits that they will reap if they will be able to attain sustainability of the liveable components of the place where they live in. Their role has evolved from teaching and researching to developmental and transformative.

The NGO's must strengthen social recognition and involvement in partnership with the community. There should be interdependence on all sides in the execution of the SCARCE movement. This will result in the building process of the urban forest and its pollution mitigating outcomes. The active involvement of the government, the academe and the NGOs becomes increasingly important for its sustainable development, answering to its particular needs. Henceforth, the roles to be played by the major significant parties would be vital to illuminate sustainability of existence of AFP as a liveable city component. The Academe should foster awareness on the value of the forest park to the student population. The park must be known for its learning importance particularly as learning site for science related classes on biology and botany. The park can be utilized by the academe for the student community extension activities where academic and extra-curricular activities can be carried out. The NGO, as another major player, should continue to enhance the existence of AFP through its alliance with the park's surrounding communities to ensure that the park will be well-maintained, and to remain as auxiliary in the management and oversight of the park to maintain its progressive components. The Government, as a fundamental player, must legitimize the administration and survival of the

park as an entity by defining a role and putting a departmental structure that would carry out laws and ordinances to protect the park against human annihilation and commercial destruction. A triangulated coordination between the social actors should be strengthened, making the Local Government Unit as the main actor and the NGO and the Academe as the ancillary social actors. To make things legal in its own right, the primary ownership of the park should be given to the Local Government, backed up by laws and ordinances providing the park its legal existence.

The latitude of approaches promoting the sustainability of AFP as part of sustainable living should be broadened to maximize community participation in building sustainable eco-spaces. Indeed, policy formulation must be legislated for innovative collaboration between LGU, academe and community managers of eco-spaces important for conservation. Accountability for actions must be established to ensure stronger foundations for the long-term stewardship of eco-spaces and urban forests.

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