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*Full Length Research Paper*

# Revitalization of Dravayawati River, Jaipur, India: A water-front development project

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History has countless evidence of civilization growing by the water-fronts. Rivers like Indus, Nile, Tigris, etc., are known for the human settlements which developed here. The river fronts today are degrading due to uncalled interventions and human ignorance towards their ecology. The trend in case of many contemporary urban rivers, surrounded by a modern society and a predominantly technology driven economy, is no different. The dying Dravayawati River in Jaipur, India, in last two decades of urban sprawl in Jaipur has been a witness to occurrence of a significantly large number of industries of different types along its urban edge. These economic growth poles have attracted population, leading to unplanned development and encroachments. Disposal of domestic and industrial waste directly into the river, lack of seasonal rainfall, encroachment on river bed, etc., have contributed adversely to the natural environment and quality of living in the urban city. Strategies to save and improve upon the quality of natural and built environment along these river-fronts are essential for an optimal ecological balance. This would also make them socially cohesive and of help to create breathing spaces amidst the dense built fabric of the urban centre. Planning interventions and design solutions, as proposed, can be relied upon as immediate and long term measures to revitalize the river and further enhance its character, locally and regionally.

**Key words:** Water-front, urban growth, environmental degradation, revitalization, social cohesiveness.

## INTRODUCTION

Jaipur, a historic planned city is presently administrative capital of Rajasthan state in north-west frontier of India. Its physical and demographic growth has been significantly higher than other cities in the state. The rapid urbanization here, owes foremost to its strategic location from the national capital, Delhi. As a part of the DMIC<sup>1</sup>

project and also being a known tourist destination the city is a prominent socio-economic center of the state. All these have boosted the urban growth of the city over the years (Jaipur Development Authority, JDA, 2011). This rapid urbanization at times may have adverse impact on the natural resources, geophysical characteristics, environment, etc., of the city. Dravayawati River in Jaipur in its role of natural drainage has been the lifeline of the city in the historic times. The Dravayawati River is a concurrent case of natural features under threat of

1. DMIC – Delhi Mumbai Industrial Corridor: a mega infra-structure project with financial and technical aids from Japan, covering an overall length of 1483 km between the political capital and business capital of India, that is, Delhi and Mumbai.

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negative impacts of urban growth.

Dravayawati River was a perennial source of water to the planned walled city of Jaipur. Due to irregular seasonal rainfall, it was realized that growing demand of water supply could not be fulfilled by the river. Later on, due to industrialization, with all the industries started to locate near the river; it became the medium to carry waste outside the city (Kathleen et al., 2013).

Due to establishment of the aforementioned economic growth poles, the city saw increase in population, reason primarily been migration of people from near-by towns in search of better economic opportunities. Vacant lands around these growth poles were encroached by these populations leading to informal development, further adding to disposal of domestic waste into the river. Hence, Dravayawati River over the years has transformed into a waste disposing nala (drain) (Government of India, Ministry of Water Resources: Central Ground Water Board, 2013), reasons being rapid urbanization, urban sprawl and sporadic industrial activity along the river.

Recently, the degrading river has gained attention due to its impact on the immediate context. The lifeline of the city has seen environmental degradation and has lost its aesthetics due to the aforementioned reasons. JDA<sup>2</sup> has taken the initiative in collaboration with Tata Projects in cleaning and cleansing of the river. Tata Projects has proposed a plan for establishment of eleven sewage treatment plants along the river, by identifying the locations of source of waste generation and disposal into the river. Further, the following phase of the proposal includes re-development of land to be acquired along the river after channelization of river bed.

### Objective of the study

The paper focuses on studying the present impact of the degrading river on the context and based on the findings form a development plan proposal for revitalization of the river and re-development of the land along the river-front after the land reclamation process.

### Methodology adopted

In order to fulfill the objectives of this study, the methodology that has been adopted, includes understanding of water-front development principles and strategies from literature provided by various authors and researchers. Also, undergoing a primary physical survey

in co-relation with secondary data (collected from stakeholders) to analyze the present scenario of the river and its immediate land-use.

### LITERATURE REVIEW

Water-fronts by common knowledge are areas where water comes in contact with land. It is where the built environment interacts with the natural environment. The characteristics of a water-front development can be described in environmental, economic and social aspects. To understand the aspects to be integrated for a water-front development, the earlier works of similar nature have been looked in.

Water-fronts contribute as an essential factor towards environment, as it consists of natural habitat, which needs to be conserved; also, major economic activities takes place at water-fronts which generate revenue at local and regional level; and provides for interaction among people.

Wrenn (1983) has characterized the water-fronts as zones of interaction between urban development and the water and a water-front area is considered to be a unique and irreplaceable resource where it interfaces between land, water, air, sun and productive plants. Also, L. Zang (2002), states that water-fronts are characterized as a place, integrating land with water and having a natural attraction to people. In fact, water edges are most attractive water features for human settlement and in most countries the land in front of water developed earlier than the island areas.

As water-fronts are limited in nature, proposing such development needs to function in a successful and sustainable manner which can only be achieved through public participation, providing essential infrastructure services, appropriate planning and design interventions, and should benefit all stakeholders.

H. Bertsch (2008) recommended several principles that must be adopted while preparing development plans for water-fronts, and they are as follows:

- (1) Accessibility: Water-fronts should have accessibility to both vehicles and pedestrians, in order to make it more usable to all.
- (2) Integrated: Integration of heritage, culture and existing developments into the new development.
- (3) Sharing benefits: The overall benefit of the development should be accommodated among the public and private agencies equally, as to maintain a balance.
- (4) Stakeholder participation: Stakeholder participation includes, government institutions, developers, environment agencies, community level organizations, and most important the public, all need to work together to make water-front development successful.
- (5) Construction phase: Project phasing is an important element of the project implementation plan, as it

2. JDA – Jaipur Development Authority: body constituted under Jaipur Development Authority Act 1982 (Act. 25) as a statutory vehicle to implement the urban development of Jaipur as envisaged by the Department of Urban Development and Housing, Government of Rajasthan.

delineates all the works priority wise.

As discussed, the aforementioned aspects need to be integrated to make a water front-development successful. The development, however, should also be sustainable in nature, as it maintains an optimum balance between nature and built environment for the future development. R. Bruttomesso (2006) formulated various principles to ensure development of water-front projects with a sustainable approach. The selected approaches adopted in the redevelopment proposal in concurrent case are: (1) secure the quality of water and the environment; (2) integration of water-fronts with the existing urban fabric; (3) public accessibility is a prerequisite; (4) public participation is an element of sustainability; (5) planning and execution in public and private partnership.

## STUDY AREA

The degraded Dravayawati River, commonly regarded as Amanishah Nala (drain) today, originates in north of Jaipur city in Amer Hills at Akadadoonga and runs down south through entire Jaipur to merge with the Dhund River which originates from the Jhalana Hills. The study area comprises of the entire length of 47.5 km of Dravayawati River lying within the U1 boundary<sup>3</sup>. Two major tributaries that merge into Amanishah Nala (drain) are Kharatapura Nala (drain) (Ganda Nala (drain)) which originates at C-Scheme and Jhalana Nala (drain) that originates at Jhalana Hills and merges with the main stream at Mansarovar and Sitapura industrial areas, respectively. The main stream and all tributaries carry industrial and domestic waste from their surroundings (Jaipur Development Authority, JDA, 2011) (Figure 1).

The adjacent land-use/cover of the Nala (drain) can be described as: first five kilometers as ravine steep slope, next twenty kilometers as residential land-use with mixed densities where maximum encroachments exists, next five kilometers passes through the Sanganer industrial area where effluents are disposed into the Nala (drain), also encroachments are observed with illegal agricultural practices going on and the last seventeen and a half kilometers of mixed-use density with Sitapura industrial area, followed by agricultural lands (Tata Projects Limited, 2015).

The prime factor for the degradation of the river is the setting up of industrial areas on the edge of the river that dispose untreated wastes, also on the basis of physical survey more than fifty sites have been identified as source of sewage disposal into the Nala (drain), mainly being unplanned and encroached residential areas. However, there are two existing sewerage treatment

plants located on the banks of the Nala (drain); Swarnajayanti Nagar STP and Delawas STP, though each are incapable to handle the existing treatment demand (Jaipur Development Authority, JDA, 2011). For proposing planning interventions and planned development, the whole stretch of 47.5 km of the river has been divided into ten sub-zones, based on their different characteristics. Also, to understand the impact of the Nala (drain) on the neighboring context, a distance of 500 m to 1.5 km has been taken as the buffer zone in this study.

## CHARACTERISTICS OF SUB-ZONES<sup>4</sup>

The following are the sub-divided zones of the Amanishah Nala (drain).

### Sub-zone 1: Growth pole

This zone consists of Vishwakarma industrial area, an economic growth pole in the region. Huge amount of industrial and domestic untreated waste is disposed in the Nala (drain) from this zone. Encroachments and unplanned residential settlements of industrial workers in search of better quality of life are common along Nala (drain).

### Sub-zone 2: Mixed land-use

The zone is a mixture of different landuses; Vidhyadhar Nagar has planned development, Ram Nagar has slums and encroachments, Kishan Bagh has industrial land use and institutional land use is predominant at Mundru. A few parcels of unplanned development along the Nala (drain) are observed in this zone.

### Sub-zone 3: Industrial and public utility

The zone consists of one of the oldest industrial areas; Hasanpura. Located near the Jaipur Railway Station, this area has attracted planned and un-planned residential and commercial development over the years. Waste generated from this region is again disposed into the nala (drain).

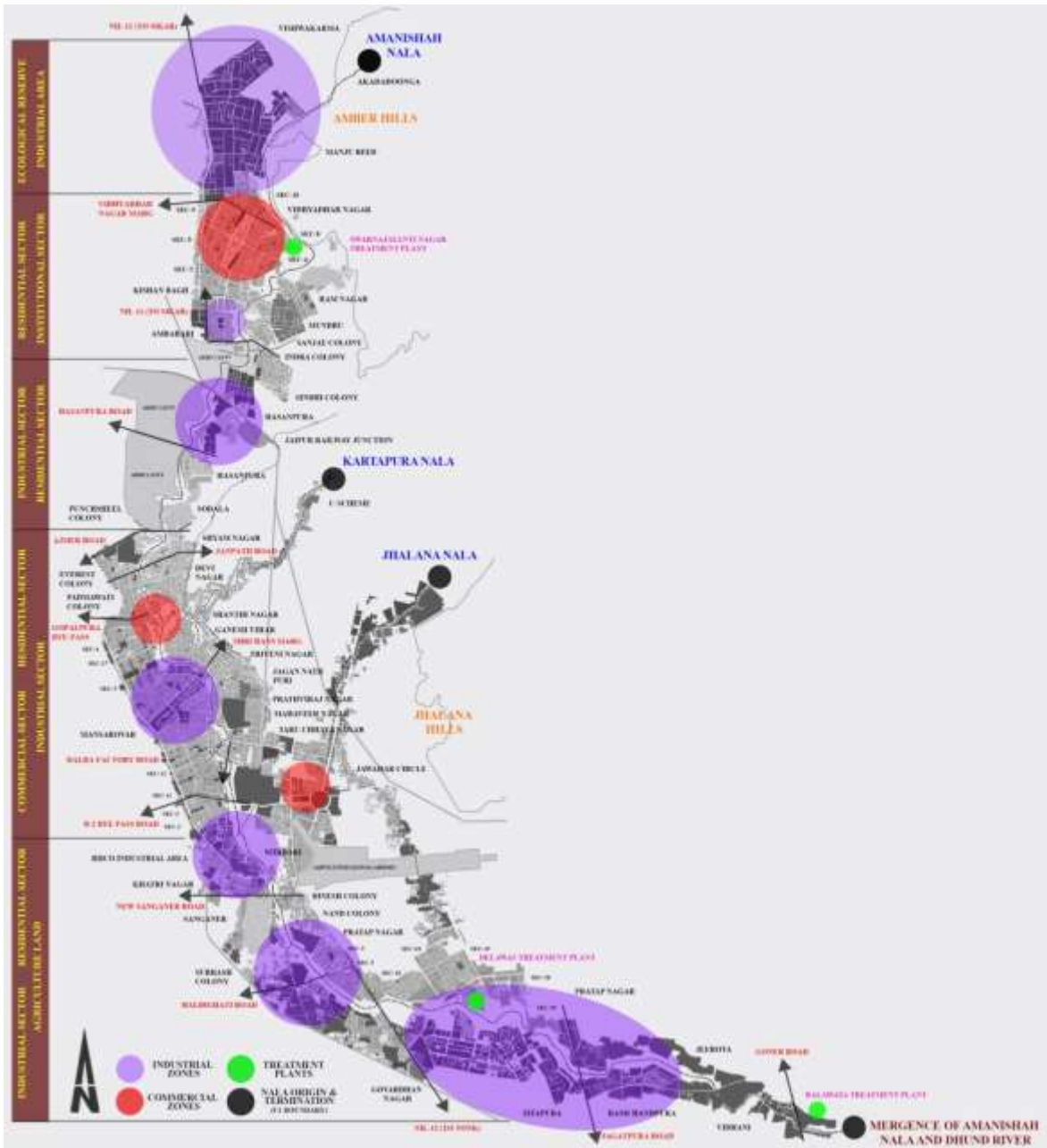
### Sub-zone 4: High density residential sector along army cantonment

High density residential development and few slums have been observed along the edge of the Nala (drain) with a

3. U1 boundary: part of urbanisable area of Jaipur including existing residential, commercial, industrial land use etc. This also includes satellite towns and committed projects by JDA.

4. Characteristics of Sub-Zones: The length of river within the U1 boundary has been sub-divided into zones on the basis of understanding of various urban planning theories.





**Figure 1.** Map showing important identified nodes along the river with the origin and termination point within the U1 boundary.

high population density. Untreated waste from this residential sector is directly disposed into the Nala (drain).

**Sub-zone 5: High investment and development zone**

This zone consists of New Aatish Market; a major commercial node which is connected by the Jaipur metro,

servicing the region with high population accessibility and usage. This gives the zone a high potential for investment and development in the future planning (Figure 2).

**Sub-zone 6: Eco-sensitive sites**

Large parcels of vacant land have been observed which needs to be preserved to maintain the balance between

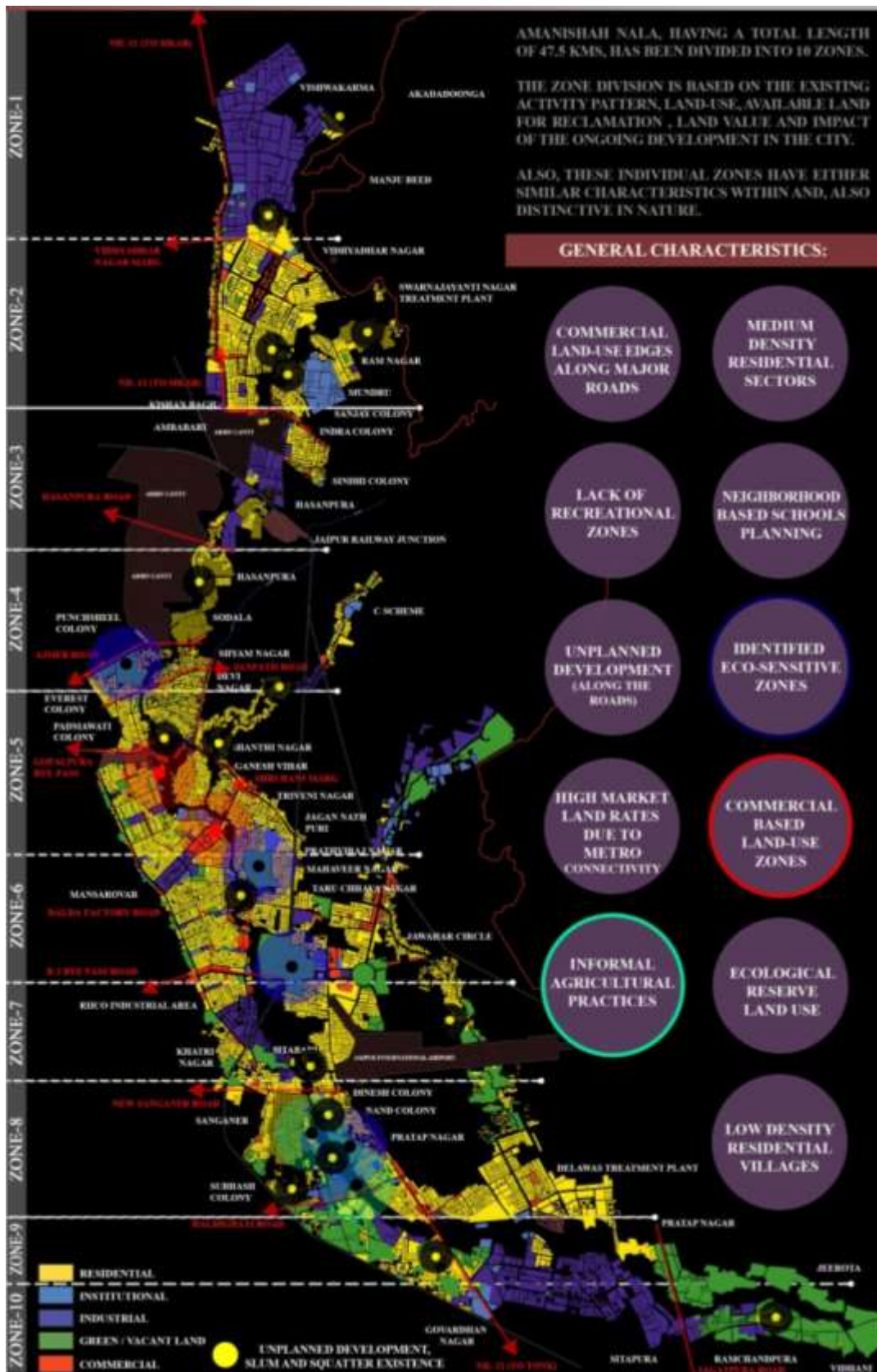


Figure 2. Map showing the sub-divided zones along the river.

built and natural environment. One of the parcels is owned by the agricultural government authorities and other one exists in a high density residential sector.

### **Sub-zone 7: Industrial and public utility**

Mansarovar industrial zone that is a tertiary based sector and existence of the Jaipur international airport serves as a high economic interacting zone. Also, huge parcels of vacant land are observed on the banks of Nala (drain) with medium density residential plots along the periphery which needs to be preserved.

### **Sub-zone 8: Mixed land-use**

The zone consists of the Sanganer industrial area which is a textile based local economy with high density residential land-use. Also, traces of slums and unplanned development are observed in this zone. Commercial land-use at edges of major roads and large parcels of vacant land are observed in the zone. High amount of waste is disposed from the local informal industries.

### **Sub-zone 9: Growth pole**

Sitapura industrial area exists in this zone with few traces of institutional and residential development. All the waste generated from this zone is disposed into the Nala (drain).

### **Sub-zone 10: Undeveloped agricultural land**

The last zone in the U1 boundary is primarily of agricultural fields, which needs to be preserved from future conversion into other land-uses.

## **DATA COLLECTION AND ANALYSIS**

Primary survey and secondary data collection have been done to identify issues related to degradation of river, its impact on the adjoining areas, their land-use, ecology, etc. For the primary data, reconnaissance survey was conducted to visually analyze the present impact of the river and based on this study, Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was concluded. Whereas, for secondary data, population, density, quantity of sewerage disposal, DLC and market rates and land ownership were collected from respective authorities for the further analysis.

### **Primary data analysis**

The primary data analysis consists of SWOT analysis which is on the basis of reconnaissance survey conducted, described briefly.

### **Strengths**

**Physical attributes:** Amanishah nala (drain) runs along the whole Jaipur, starting from the north east in the hills of Amer to the south west of the city, where it merges with the Dhund River. It serves as a natural drainage to the city's storm and waste water system.

**Strong urban form with distinct character:** The nala (drain) runs through areas of different typologies of landuse, ranging from industrial to commercial, including residential sector, each unique in itself. Each sector can be served respectively in terms of activities that can be provided for both social and economic development.

**Impact of ongoing city development:** Upcoming of various infrastructure and utility projects, has affected and modified the development pattern around the nala (drain) and has improved the quality of living conditions in some sectors (Figure 3).

### **Weaknesses**

**Limited accessibility:** The Nala (drain) is not accessible at the edges, but is only visible through various culverts/bridges crossing the Nala (drain). Hence, hindering the physical contact of the population with it.

**Blighted physical conditions:** The river is degrading due to the ignorance of human interventions. Some of its parts are dried up, whereas rests are either disposed with waste or are encroached.

**Stigma for present context-land value:** Due to degrading conditions, land values along the Nala (drain) is diminishing and is affecting the nearby context. Measures should be adopted to limit this effect on the land value by the Nala (drain).

**Context turns their back to the Nala (drain):** No present development faces the Nala (drain), due to its negative aspects, resulting in losing as an identity to the city.

### **Opportunities**

**Can be established as engine of sustainable growth:** The development of Nala (drain) will not only cater to the sustainability of the environment but also with introduction of appropriate activities, can generate employment opportunities for the migrating population and will help in improving the socio-economic status.

**Re-claim brown field development:** This development can be taken up as an option for land acquirement and can be put to a better use which is more socio-economic viable.

**Wider access to better environment quality:** The intention should be to promote better quality urban environment through conservation, enhancement, regeneration and reduction of pollution and congestion around the river-front.

### **Threats**

**Environment degradation:** If re-development of the Nala (drain) is ignored, it will proceed further towards environment degradation and will not promote better environment quality for the context.

**Encroachments:** Unsystematic development can take place in form of encroachments by which will lead to further degradation of





Figure 3. Map showing the identified issues along the river, based on physical survey.

the Nala (drain), as more untreated waste will be disposed and the proposed treatment plants will be in-effective.

### Secondary data analysis

The data collected from various authorities were analyzed and the conclusion is briefly described as the following.

**Population growth rate:** From the Jaipur's MDP<sup>5</sup> 2025, the population within the U1 boundary would be 75.9 lakhs by 2045 with an annual growth rate of 2% (Jaipur Development Authority, JDA, 2011).

**Population density:** The current average density within the U1 boundary is 128.97 pph (Jaipur Development Authority, JDA, 2011).

**Sewerage disposal:** The net catchment area within the U1 is 184 sqkm and the sewerage generated by the population is 275 MLD (current data). Hence, deducting the waste treatment by the present functioning STP's, the total untreated waste is 150 MLD (Tata Projects Limited, 2015).

**Land values:** From the analysis of DLC<sup>6</sup> and market rates along the nala (drain), the average ratio of both comes to be 1.65, with is lower than the ideal ratio of 1.8 to 2.2.

## RESULTS AND DISCUSSION

Based on the analysis of the aforementioned data, the city is witnessing growth in population with a medium based spatial density pattern; however, presently the amount of waste generated and disposed by the various city activities is not treated to the standards, resulting in unpleasant aesthetics and environmental degradation. Also, the context is affected by this impact, as it degrades the neighboring land values; concluded from the secondary data, the DLC/Market Rate Ratio is lower than the ideal ratio range.

Jaipur is witnessing rapid urbanization over the last few decades affecting the spatial growth pattern and the natural environment. One of the impacts is on the natural urban river which has been degrading over the years due to human ignorance, which actually needs attention on priority. Appropriate planning and design initiatives for the river front development, thus need to be taken promptly to ensure better quality of life and a healthy environment. Also, it is important to control the future development along the river-front to protect it from excessive development practices. The aim to conserve the only existing urban river, Dravayawati, can be accomplished by integrating activities that promotes human

cohesiveness and engagement. To achieve the aforementioned, specific land-use and activities need to be integrated to make the river-front accessible to the public.

## RECOMMENDATIONS

The recommendations for revitalization of Amanishah Nala (drain), based on the earlier discussed analysis, are divided into planning and design prospects. The planning prospects consists of land-use proposal for the vacant parcels, development control guidelines for existing developments and various infrastructure based developments like transportation, urban housing, etc., whereas the design prospects consists of designing of Nala (drain) channels based on different sections and neighboring land-uses to promote public cohesiveness.

### Planning prospects

The planning interventions for the Amanishah Nala (drain) are described as follows:

- (1) To identify catchment areas and propose water shed development.
- (2) To regulate urban land-use change appropriately to minimize negative impact of the present as well as the future development.
- (3) Providing urban housing solutions to existing slums and encroachments to achieve equity and enhance their quality of life (Figures 4 to 7).
- (4) Conserving the eco-sensitive sites and integrate them with the river front development, thus enhancing the environment quality.
- (5) Proposing commercial land-use with public/semi-public function with integration of private sector; to generate funds for the future operations and maintenance of the river-front development.

### Design prospects

The design interventions for the Amanishah Nala (drain) are described as the following.

- (1) Identify different river sections along the stretch and design appropriately, to limit further urban growth and enhance its accessibility; to achieve the goal of social cohesiveness.
- (2) Integrating land-uses with open spaces to promote public accessibility.
- (3) Identifying in-efficient culverts/bridges and restructuring them to meet the present and future traffic demand to avoid traffic congestions and bottle necks.
- (4) Designing of public landscaped walkways, urban

5. MDP - Master Development Plan: vision document giving perspective of 20 to 25 years keeping in view the future growth of population, economic development potential and ecological improvements likely to come up during the plan period.

6. DLC - District Level Committee: land valuation rate which is based on the average rates laid down by the district level committee for registration of sale deeds under Stamps and Registration Act.



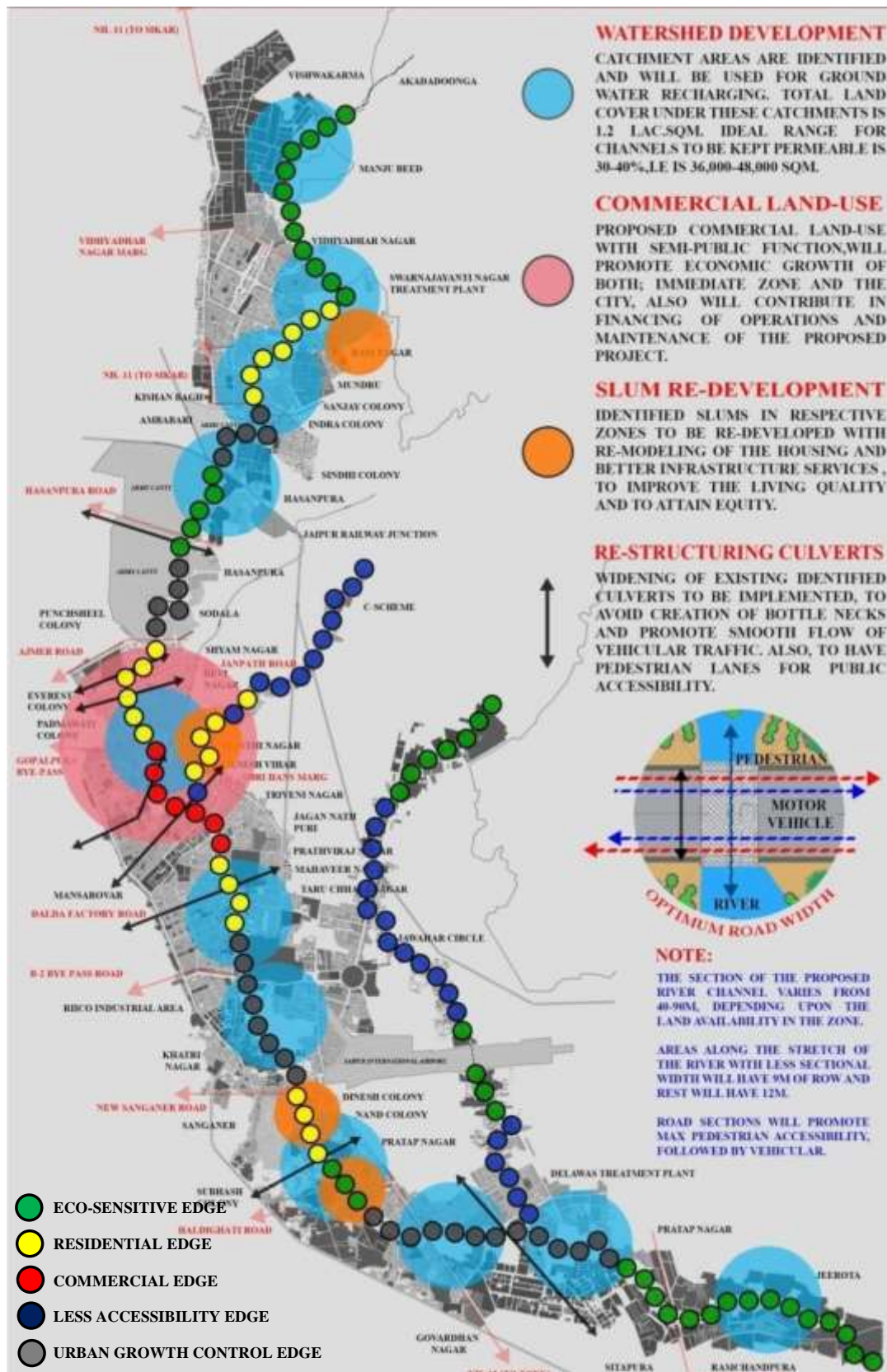
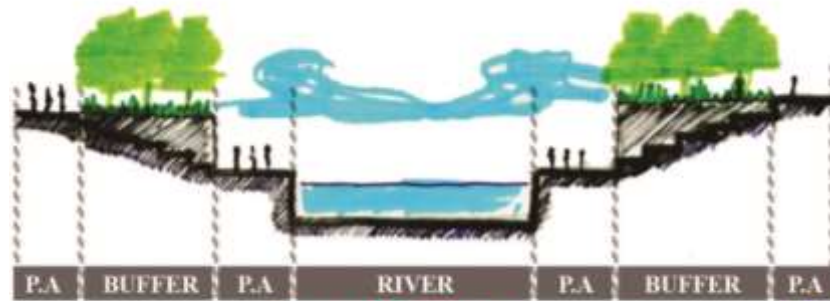


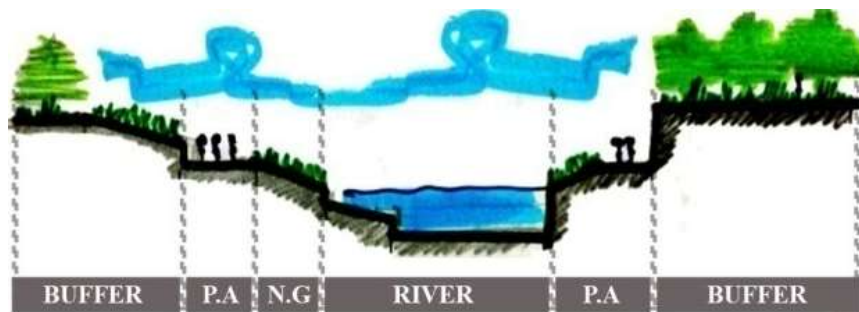
Figure 4. Map showing the macro-level recommendations along the river.



**RESIDENTIAL**

PROVIDING ACCESSIBILITY FROM BOTH THE DIRECTIONS, TO ACHIEVE PUBLIC COHESIVENESS AND A BREATHING SPACE FOR PUBLIC TO APPRECIATE THE RIVER FRONT.

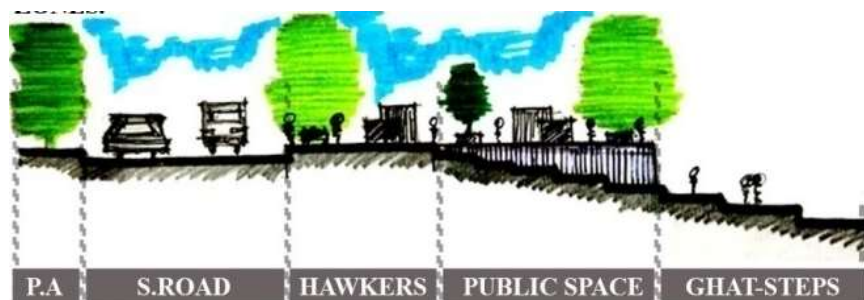
Figure 5. The sketch depicts river sections along high residential density sector.



**COMMERCIAL ZONES**

CONNECTING COMMERCIAL LAND-USES WITH RECREATIONAL SPACES TO PROVIDE INTERACTING ZONES FOR PUBLIC TO REJUVENATE AND MAINTAIN A BALANCE BETWEEN BUILT AND NATURAL ENVIRONMENT.

Figure 6. The sketch depicts river sections along commercial zones.



**TYPICAL SECTION OF GREEN BUFFER**

PROVIDING GREEN BUFFER ALONG THE WHOLE RIVER STRETCH AND DEDICATED SPACES FOR INFORMAL ACTIVITIES TO INTERACT WITH NATURE AND POPULATION, THUS, ATTAINING EQUITY AND ENCOURAGING THE LOCAL INFORMAL ECONOMY.

Figure 7. The sketch depicts typical ideal green buffer section along the river.

furniture and infrastructure services to improve the social aspect of the future development.

Besides the planning and design recommendation for the river front project, it is also essential to address the planning issues that may arise for post development of the project. The future impact can lead to issues related to sudden demographics growth, haphazard economic growth, public interest related, slum formations, etc., hence altering the land-use which may not be according to ones planned by the authorities. Hence, there's a need to formulate strict land-use regulations along the river stretch in order to tackle the aforementioned issues.

To regulate the aforementioned land-use change various strategies that can be adopted, which are:

(1) Land taxation: Higher property taxes to be incurred by the property owners, where land-use change is to be restricted and providing subsidies where land density is to be increased. Also, specifying the maximum FAR to control the density pattern of the area.

(2) Agricultural land parcels: Sites undergoing illegal agricultural practices need to be protected and consumed with sustainability and initiatives to be taken up to increase the land productivity.

(3) Community participation: The governance and management of the project can be executed at ward level with the respective population, under local formulated public committees that will be in direct contact with the monitoring of the overall development of the project.

## CONFLICT OF INTERESTS

The authors have not declared any conflicts of interest.

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*Full Length Research Paper*

# Constraints of affordable housing through cooperative societies in tertiary institutions in Lagos State, Nigeria

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This study evaluated the different constraints of affordable housing and the different strategies employed by cooperative housing societies in tertiary institutions in Lagos State to ameliorate these constraints. Data for the study were obtained from both primary and secondary sources. A set of questionnaire were designed. The questionnaire targeted the executives of the cooperative societies in the tertiary institutions in Lagos state and was administered using simple random sampling technique on executives of the cooperative societies in the tertiary institutions. A total of 50 executives of cooperative societies in the tertiary institutions in Lagos state were selected for questionnaire administration. Information were obtained on respondents' profile, type of cooperative societies, activities of the cooperative societies, methods of housing provision and the challenges faced by the cooperative societies in housing provision. Information was obtained from secondary data including: journals, publications and internet materials. Descriptive and inferential statistical techniques of data analysis were employed. Results revealed that the provision of general loans, provision of housing construction loan for members, provision of specific loans for the purchase of land, provision of special loans for renovation of existing buildings and collective purchase of land for building construction were the most dominant strategies adopted by the cooperative societies in the provision of affordable housing for their members in the study area. Result also revealed that cost of materials of construction and unnecessary bureaucracy were the most significant constraints to affordable housing provision by the cooperative societies in the study area. The study concluded that non availability of affordable housing is an issue across the state irrespective of the class and people with the low income earners facing the problem the most. The study recommended that dedicated recurrent funding by the government could systematically address the issue.

**Key words:** Affordable housing, cooperative societies, housing, housing constraint, Lagos State, tertiary institutions.

## INTRODUCTION

Access to adequate, affordable and quality housing is an important social goal in many countries. Housing fulfills a

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fundamental aspect of man's need given that access to safe and adequate shelter and basic service is essential to a person's physical, psychological, social and economic well-being. In the hierarchy of man's need, housing has been ranked second (Olotuah, 2000) and as a result, housing provision has become a paramount cornerstone of the policies of various governments. Affordable housing is crucial to maintaining an adequate labour force and also creates opportunities for people to be productive and contribute to their society. Yet around the world, in developing and advanced economies alike, cities are struggling to meet that need.

Studies have shown that Nigeria like any other developing nations is facing a multi-dimensional problem of housing, especially for low income earners who constitute the majority of the population (Adedeji, 2007). The problem of population explosion, continuous influx of people from rural to the urban centres and the lack of basic infrastructure required for a good standard of living, disparity between the price and quantity of housing, the number of households and the money available to them to pay these prices have compounded housing problems over the years (Olotuah, 2009).

Responding to this challenge, government had enacted various measures to alleviate the situation and one of the major responses to this has been public housing. Also, the private sector played active role in the provision of housing to the people by exploring viable housing markets in the country. However, access by low income earners to housing has become difficult simply because they cannot afford it. Recognizing this and assessing the inability of the low income earner to have access to housing, the co-operative society has actively been involved in the provision of housing for their members through cooperative housing which is a pragmatic and cost effective means of home ownership.

Cooperatives societies are defined as "an autonomous association of persons who unite voluntarily to meet their common economic and social needs and aspiration through a jointly owned and democratically controlled enterprise" (Agriculture, Fisheries and Conservation Department (AFCD) 2015). According to Owojuyigbe (1998), Nweze (2003), Godwin, (2011), Nwankwo et al. (2012) and Kareem et al. (2012), cooperative societies play essential roles in national development. Of particular interest and concern is the activity of cooperative societies in the area of housing development (Fashakin, 1998; Sazama, 2000; National Co-operative Housing Association of America, 2001; Sheuya, 2007).

Oduun and Ibe (2011) noted that fewer studies have been carried out on the processes undertaken by group buyers in the alternative land and housing delivery systems in Nigeria. The study opined further that; group buyers such as cooperative societies can be considered most appropriate organizations that can assist government in meeting the targets set under the 1991

National Housing Policy aiming at ensuring that the disadvantaged people gain access to decent housing. According to Babade (2007), to adequately house the urban population in Nigeria, a conservative Figure of 409,227 housing units should have been constructed in 1990. Due to neglect, the figure rose to 783,042 units in 1995; 1,333,176 units in the year 2000; 1,543,318 units in 2003 and 2,171,603 units in 2010.

Based on the above, Oyewole (2010) and Yakub et al. (2012), proposed the involvement of cooperative societies in housing development as an urgent step needed to be backed by governments, to bring about the much needed transformation in the Nigerian housing sector. Along this direction, this study is an attempt to examine affordable housing provision through cooperative societies in tertiary institutions in Lagos State, Nigeria.

## Literature review

Affordable housing which is defined as the ratio of income to housing cost has become elusive to an average Nigerian, in spite of numerous programmes put in action by the various government of the country (Obi and Ubani, 2014). Affordable housing is generally considered to be houses which meet the needs of households whose incomes are not sufficient to allow them to access appropriate housing in the market. Decent housing has been universally accepted as one of the basic needs of individuals, the family and the environment (Adeboyejo, 2005).

However, for many Nigerians, the desirability of owning or living in decent homes is as strong as the reality of its elusiveness. Inability to afford this prime asset is largely a root cause of the deficient housing situation in Nigeria. It is an established fact that many households in the country today, live below the poverty line. In fact, investigation has shown that the highest percentage of Nigeria's workforce works in the public sector and earns their monthly salary of below one dollar per day (Godwin, 2011). Other challenges associated with housing affordability is high cost of building materials, inadequate financial structure as well as poor managerial skill of our mortgage institutions.

## The challenges of housing

As an economic resource, the house provides space for production and access to income-earning opportunities. There is nothing that can be compared to having a comfortable dwelling to rest in after the daily activities of man, absence of this basic necessity, man can bring out the worse of behaviour if deprived of it or inaccessible to it. The present housing situations is characterized by high density, overcrowding condition and insufficient facilities.

Other challenges include rapid urbanization process, rapid rural urban drift amidst many. The approach to housing policy in Nigeria to ameliorate these situations has tended to oscillate between the 'welfare mixed economy' and the 'free market model'. The conventional wisdom today is that "government has no business building houses", and that governments should focus on providing favourable investment climates, infrastructure and mortgage facilities to low-to middle income families (Akeju, 2007).

This contrasts with other areas of social policy such as education and health, where governments have applied a much more comprehensive and universal approach. Conventionally therefore, two contrasting models of housing policy identified are the non-statist and statist perspectives (Kemeny, 1992). These, Clapham et al. (1990) referred to, respectively as market model and the social democratic model. While one model advocates minimum intervention from the state, the other model is a strong advocate of state intervention to secure a joint to the various rights entitled to every citizen. These two models of housing policy approximate to the two schools of thought concerning the nature of housing: either as 'economic' good or as a 'social' good or service.

Advocates of a free market in housing often present an economic case, arguing that the market provides an efficient way of allocating scarce resources by directing productive factors into the supply of those goods and services which are most in demands. In the Nigerian context, official participation in housing may be viewed not only as a social and environmental necessity, but a political and economic expediency, necessary to support peace and stable development. Olayiwola et al. (2005) asserted that official interventions in housing are politically necessary options aimed at the control and regulation of the "contents" of housing through the urban space in order to prevent a disruption of the system or the total collapse of the prevailing social superstructure of the society. Private market mechanisms cannot meet the housing needs of the low-income groups; nor do they have the incentives to embark on housing for a segment of the population that cannot pay for it".

### ***Government intervention in housing delivery***

Justification for government intervention also points to the imperfections of the market, the need to cater for some groups in society who may not be able to make provision for themselves, and the need for the state to intervene in the market in order to provide costly but essential support networks and infrastructure. It is one of the prerogative duties of the government to provide adequate and affordable housing facilities especially for the lower income group among the civil servant who ordinarily may not afford a house due to the high cost of acquiring house

in the country. A given example of government intervention in housing is Australia government bodies which perform a vital role in the delivery of a well-planned built environments and a robust sustainable, equitable, social infrastructure.

In Nigeria however, many factors contributed to ineffectiveness of the government policy apart from the fact that the salary of the low income earner is a far cry to the cost of owning a house, the high cost of construction and the legal bureaucracy are also a contributing factor. Research on public housing impinges upon social policy in general and housing policy in particular, hence the need for an understanding of the role of the state in housing provision. With reference to the public sector, access to decent housing units is a major social welfare consideration and indirectly promotes economic well-being and sustainable development. Public housing is justified because housing is a necessity. It is expensive to provide as the method especially here in Nigeria to construct a decent housing is quite inaccessible to the low income earners yet the provision can be abused by the private sector and so lead to imperfections in the allocation of housing resources which is a major setback for the target citizenry.

Provision of civil servant housing in Nigeria is an important programme which has undergone a lot of review over the years. Housing policy can be viewed as a component of social policy, other areas being health care, education, employment, retirement, as well as policies for the socially disadvantaged. Social policy refers to the study of the role of the State in relation to the welfare of its citizens. Housing policy is closely linked with political philosophies resulting in different views as to the degree of intervention that is desirable.

However, the policy recommends strategies for improving the housing situation of the low income group and these include massive private and public investment in housing provision. Most employee outside the public or outside the organized private sector as well as many self-employed Nigeria earn well below the national minimum wage, thus represent about seventy percent (70 %) of Nigeria population that fall into this category which also form the core of the nation's economy (Ayeni, 1991). It is one of the prerogative duties of the government to provide adequate and affordable housing facilities especially for the lower income group among the civil servant who ordinarily may not afford a house due to the high cost of acquiring house in the country.

### ***Private intervention in housing delivery***

The new drive at meeting the housing needs of Nigerians is anchored on private sector led housing delivery. The housing market in Nigeria is dominated by the private sector stock of buildings. Studies have revealed that as at

2002, it was the formal and informal private sectors that were consistently providing over 90% stock in the country (FGN, 2002). However, the housing units produced by the private sector are usually out of reach of the low income earners. This is as a result of the determining factor which is the price system working through the interplay of demand and supply and ultimately excludes the low income earners (Agboola and Adegoke, 2007).

The private sector in the housing delivery consists of the individuals and corporate organizations which are usually for direct use of their staff, for rental or sale. The sector has been more efficient in the production of housing and only need an enabling environment for the sector to meet the housing need of the people. It emerged as a result of the need to meet the increasing demand of housing which could be due to the failure of the public sector to meet this demand. The private sector involvement goes beyond direct housing construction to manufacturing of types of building materials, supply of labour and capital (Windapo, 2007).

The argument in favour of private sector is directed towards the efficiency and effectiveness of the private sector as well as the corruption and inefficiency of the public sector. This has called for the introduction at stimulating and assisting the private sector to pay the leading roles in housing production and delivery. The reforms includes the establishment of Real Estate Developers Association of Nigeria, Building Materials Producers Association of Nigeria, the introduction of reduced interest rates on national housing fund loan to members and restructuring of the housing finance sub-sector to include the introduction of secondary mortgage market. However, the housing units produced by the private sector are usually unaffordable to the low income earners. This has been a major limitation of the sector and could be attributed to the cost of construction of each house which is usually on incremental development. More so, the provision is for profit making and any house owner who has expended as much as it takes to build a house will want to recoup his capital investment.

### ***Cooperative society as an alternative to affordable housing delivery***

Against the backdrop of the various housing provision especially to the low income earners it is imperative that other prospective measures should be applied. Various authorities have proffered strategies for improving housing delivery. Fasakin (1998) suggested that the cooperative housing movement should be given a closer look. Oduwaye (1998) posits that the rigid bureaucratic system of government should be streamlined, while issues of land allocation and housing finance should be addressed. Omole (2001) suggested that financial institutions should be more accessible to the people.

It has been observed that the activities of cooperative

societies in financing housing are impressive in Nigeria in the past three decades. Agbola asserted that these societies are usually organized as social associations but with more explicit commitment to financial activities of individuals and thus the collective interest of their members. Their emergence is generally a response to prevailing social needs of their localities. These cooperative groups have very effective methods of generating funds both from within and outside their members. Such funds, irrespective of their stated purposes, which seldom specifically include housing, could sometimes be diverted to house building.

In addition to giving house-building loans to members, cooperative societies also embark upon model housing construction aimed at encouraging members to save towards purchasing a dwelling. This is an attempt to imitate government housing schemes to which most of their members do not have access. Examples can be cited from Reis into the activities of two cooperative unions at Ibadan in 1995. The two cooperative unions are Ibadan Cooperative Thrift and Credit Union (C.T.C.U.), and the Owolowo Union. Reis (1995) observed that the two cooperatives, though with varied membership, facilitate house ownership for members in divers ways, one of which is construction of blocks of flats, which were allotted to members at subsidized rates. Such ventures illustrate the potentials of cooperative societies to curtail the effect of economic recession on its members. Also, cooperative organizations such like Owo Multi-purpose Cooperatives, Credit Thrift Cooperative Society (CTCS) in Ondo State, Nigeria are playing significant roles in assisting members in owning houses. Such assistance is given in the area of land acquisition, processing of documents and materials acquisition.

### **The study area**

In terms of land mass, Lagos State is the smallest state in Nigeria, yet the second most populous State after Kano with a population of 9,013,534 (NPC, 2006). It lies in Southwest Nigeria, on the Atlantic coast in the Gulf of Guinea, west of the Niger River delta, located between Latitude 6° and 7° North of the Equator and Longitude 3° and 4° East of the Greenwich Meridian. It is arguably the most economically important state and houses the nation's largest urban area. Lagos is the major centre of commerce of Nigeria.

This research focuses on all the tertiary institutions in Lagos State. This includes universities, polytechnics, institutes of learning and colleges of education. There are nineteen (19) tertiary institutions in the state and these include: Four (4) universities, six (6) polytechnics and nine (9) colleges of education. Among which are: Lagos State University, University of Lagos, Yaba College of Technology, Lagos State Polytechnic, Adeniran

**Table 1.** Selected tertiary institutions in Lagos State and number of cooperative societies.

S/N	Institutions	No of cooperatives	Name of cooperative societies
1	UNILAG	5	Unique UNILAG staff multipurpose cooperative society; Thrift cooperative multipurpose society; Guest houses multipurpose cooperative society; Academic staff cooperative society and USTRA cooperative Society
2	LASU	6	Lasu cooperative thrift and credit society; Lasu christain cooperative society; Lasu muslims cooperative society (Zero interest); SSANU cooperative society and Lasu agric cooperative society
3	Adeniran Ogunsanya College of Education (AOCED)	5	General co-operative Society (Non /teaching Staff); COESU for non-academic staff; Charity Cooperative society – Christian members; Zero interest cooperative society (Muslim members); Agric cooperative society.
4	Lagos State Polytechnic	3	Staff of Laspotech Cooperative; Zero Interest cooperative society; Agric cooperative society.
5	Federal College of Technology	1	Academic multipurpose society
6	Yaba College of Technology	2	Yabatech Cooperative Society, YCT Agric and Multipurpose Cooperative society
	<b>Total</b>	<b>22</b>	

Source: Authors' Field Survey, 2015.

Ogunsaya college of Education, Caleb University, Federal College of Education Akoka, Grace Polytechnic, National Open University, Ronik Polytechnic and St. Augustine College of Education among others. There are 151 tertiary institutions in Nigeria while those situated at Lagos represent a total 28.69% of the tertiary institutions in Nigeria as a whole.

**METHODOLOGY**

Data for this study was derived from both primary and secondary sources. Purposive sampling technique was adopted for the study in which all the six public tertiary institutions were selected (University of Lagos (UNILAG), Lagos State University, Ojo (LASU), Adeniran Ogunsanya College of Education (AOCED), Lagos State Polytechnic (LASPOTECH) Yaba College of Technology (YABATECH) and Federal College of Technology.

Pilot survey revealed that there were twenty two (22) cooperative societies in the selected public tertiary institution in Lagos state (5, 6, 5, 3, 2 and 1 respectively in UNILAG, LASU, AOCEd, LASPOTECH, YABATECH and Federal College of Technology, Akoka) (Table 1). To determine the size of the sample, a famous formula referred to as 'Yard's formula' was used. It is expressed mathematically as:

$$n = N / 1 + N \alpha^2$$

Where n = desired sample size; N = population size; A =

maximum acceptable margin of error = 0.05

Therefore, in determining the sample size, the researcher made use of estimated population of one hundred and thirty-five (70) respondents from the co-operative societies in tertiary institutions in Lagos State.

$$n = ? \quad N = , \quad \alpha = 5\% = 0.05; \quad n = 135 / 1 + 70 (0.05)^2; \quad n = 135 / 1.375; \quad n = 50.90; \quad n = 50.90 \text{ respondents}$$

Therefore, the sample size used on the basis of the calculation is 50.90 respondents. However, in order to give room for error margin, the researcher made use of 50 respondents. Hence, a sample size of fifty (50) executive members of the co-operative societies in the six (6) selected public tertiary institutions in Lagos State were used to represent the entire population of the respondents. The reliability analysis used SPSS software to evaluate the independent variables on the dependent variable. The result shows that reliability scale test for the items of the questionnaire score is 0.944 (Cronbach's Alpha). This thus affirmed that the research instrument used for the study is reliable as it is more than the least accepted reliability score of 0.7. Meanwhile, only forty-four (44) questionnaires was completed and returned for analysis.

**RESULTS AND DISCUSSION**

This section investigated the strategies adopted by the cooperative societies in the provision of affordable

**Table 2.** Current range of activities of your co-operative society in housing provision.

<b>Activities of cooperative societies</b>	<b>N</b>	<b>Mean Score</b>	<b>Rank</b>
Provision of general loans	44	4.00	1
Provision of housing construction loan for members	44	3.95	2
Provision of specific loans for the purchase of land	44	3.36	3
Provision of special loans for renovation of existing buildings for members	44	3.23	4
Collective purchase of land for members for building construction	44	3.09	5
Help in accessing housing loans from government agencies for members	44	2.84	6
Pooling of professional skills and expertise in the construction process	44	1.89	7
Construction of houses for purchase by general public	44	1.73	8
Construction of houses for purchase by members	44	1.59	9
Construction of houses for renting to general public	44	1.50	10
Construction of houses for renting to members	44	1.32	11
Help in accessing housing loans from banks for members	44	1.23	12

Source: Authors' Field Survey, 2015

housing in the study area. Thus, Table 2 shows the current range of activities of respondents' cooperative society in housing provision in the study area. It was revealed that provision of general loans ranked 1<sup>st</sup> with mean of 4.00. This is usually the dominant strategy usually adopted by most of the cooperative societies in the study area, as this offer members finance for all activities including house construction. Provision of housing construction loan for members ranked 2<sup>nd</sup> with mean of 3.95. In this instance, the cooperative societies assist members with finance for house construction or maintenance. Another prominent activity usually undertaken by the cooperative societies is the provision of specific loans for the purchase of land which ranked 3<sup>rd</sup> with mean of 3.36. Here, the cooperative societies facilitate land acquisition and development, including processing titles and providing building plans.

Therefore, it can be concluded that of all the activities undertaken by the cooperative societies in housing provision in the study area, the first-three highly ranked activities of the cooperative societies are the ones well pronounced and most commonly known by the people who are supposedly members of the cooperative societies because they have benefited from them.

Meanwhile, ranked last on the table of the strategies adopted by the cooperative societies are: 'they help in accessing housing loans from banks for members' with mean of 1.23, this activity is less dominant because of the stringent measures and high interest rates usually charged by the financial institutions. Construction of houses for renting to members has mean of 1.32 and construction of houses for renting to general public has mean of 1.50. This can be attributed to the fact that the cooperative societies have not fully implemented these strategies. These activities though on the list, ranked very low which indicated that they have no considerable effect

in the society and members have not been enjoying such benefits when compared with those activities which ranked very high. Thus, it could be concluded that the first four activities of the cooperative societies were the most common strategies adopted by the cooperative societies in housing provision in the study area.

### **Constraints to housing provision by the cooperative societies in the study area**

On the barriers co-operative societies faced in the provision of affordable housing to its members in the study area as presented in Table 3, it was revealed that 'the type of construction method used increases the cost and makes housing expensive' ranked 1<sup>st</sup> with mean of 2.36; this is seen by members as the most prominent barrier to affordable housing provision by the cooperative societies because the cooperative societies are engaged in sophisticated design and methods of construction which makes the houses built unaffordable to majority of the members. Bureaucracy is affecting the provision of housing by co-operative societies ranking 2<sup>nd</sup> with mean of 2.32; bottlenecks in accessing funds and stringent measures in loan acquisition by the cooperative societies. Government policies is affecting the provision of housing by co-operative societies ranking 3<sup>rd</sup> with mean of 2.09, this arises from corruption and lack of political will from decision makers. Internal management issues in co-operative societies ranked 4<sup>th</sup> with mean of 1.93; at times, there are often disagreement among the executives of the cooperative societies which delays fund mobilization and allocation.

Inaccessibility to finance by mortgage bank is causing the barrier to housing provision ranked 5<sup>th</sup> with mean of 1.61; several cooperatives have had difficulties in

**Table 3.** Barriers co-operative societies face in provision of affordable housing.

Constraints	N	Mean Score	Rank
The type of construction method use increases the cost and make housing expensive	44	2.36	1
Bureaucracy is affecting the provision of housing by co-operative societies	44	2.32	2
Government policies is affecting the provision of housing by co-operative societies	44	2.09	3
Internal management issues in co-operative societies	44	1.93	4
Inaccessibility to finance by mortgage bank is causing the barrier to housing provision	44	1.61	5
High dependency on foreign building materials is a major problem	44	1.50	6

Source: Authors' Field Survey, 2015.

**Table 4.** Measures implemented by co-operative societies to ameliorate these barriers.

Type of measures engaged	N	Mean score	Rank
Removing instalment increment in building cost by ensuring collective construction whereby materials are purchase in bulk	44	3.68	1
Acquiring building materials directly from the manufacturers thereby subsidized financing costs for members	44	3.09	2
Using collective in-put of member skills in the construction process	44	2.59	3
Accessing funds from the state government through the collective interest of the members	44	2.18	4
Using collective interest of the members to access loans from mortgage banks	44	1.91	5

Source: Authors' field Survey, 2015.

sourcing funds from financing institutions. One of the hitches is the need to raise large sums of capital and at the same time incur the liability to pay interest on borrowed capital. This makes financing for cooperative housing development a major challenge due to insufficient financial resources. High dependency on foreign building materials is a major problem ranked 6<sup>th</sup> with mean of 1.50. This corroborates observations made by Ogunsemi (2010) and Adedeji (2007) that high cost of building materials is a bane to housing delivery in Nigeria.

To this extent, it can be deduced that the aforementioned are barriers the co-operative societies in the study area encountered in the provision of affordable houses and this affects their ability to satisfy such desires of the members.

### Measures implemented by cooperative societies to remove the constraints of housing provision

Table 4 shows information on the measures implemented by co-operative societies to ameliorate the barriers to housing provision for members in the study area. Removing installment increment in building cost by ensuring collective construction whereby materials are purchase in bulk ranked 1<sup>st</sup> with mean of 3.68, this implies that when materials for housing construction are built in bulk it tends to reduce the cost. Acquiring building materials directly from the manufacturers thereby

subsidized financing costs for members ranked 2<sup>nd</sup> with mean of 3.09, using collective in-put of member skills in the construction process ranked 3<sup>rd</sup> with mean of 2.59, accessing funds from the state government through the collective interest of the members ranked 4<sup>th</sup> with mean of 2.18, this has been found effective in America where 17% of the total number of rent-reduction housing units in America are cooperatives and where its growth has been attributed to the high government support it gets through direct funding and legislation. Using collective interest of the members to access loans from mortgage banks ranked 5<sup>th</sup> with mean of 1.91. This is seen by members as the least measure to remove the constraints of affordable housing provision by the cooperative societies in the study area because studies have shown that mortgage financing in Nigeria is not well developed.

### Conclusion

The focus of this study was on evaluation of the different constraints of affordable housing and developing different measures to ameliorate these constraints. The study indicated that cooperative societies have provided housing loan to a substantial number of its members enabling them to purchase land and own their personal houses. It further shows that type of construction methods and materials of construction makes housing to be expensive and unaffordable to the members. The issue of

bureaucracy in accessibility to finance is another constraint to affordable housing provision by the cooperative societies in the study area.

Consequently, government programmes could systematically address the issue if only it were sustained with the support of dedicated recurrent funding. These concerns the problems encountered in sourcing land and financing construction. Also, there should be a direct involvement of the government in the bureaucratic process of land allocation and putting up financing facilities to enable cooperative societies to be considered without stringent conditions.

## CONFLICT OF INTERESTS

The authors have not declared any conflicts of interest.

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A hand holding a vintage-style compass against a background of green foliage. The compass is the central focus, with its lens and dial clearly visible. The background is a soft-focus green, suggesting a natural outdoor setting.

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