

# Spatial planning and open space integration in urban Ethiopia:

A sustainable accessibility exegesis.

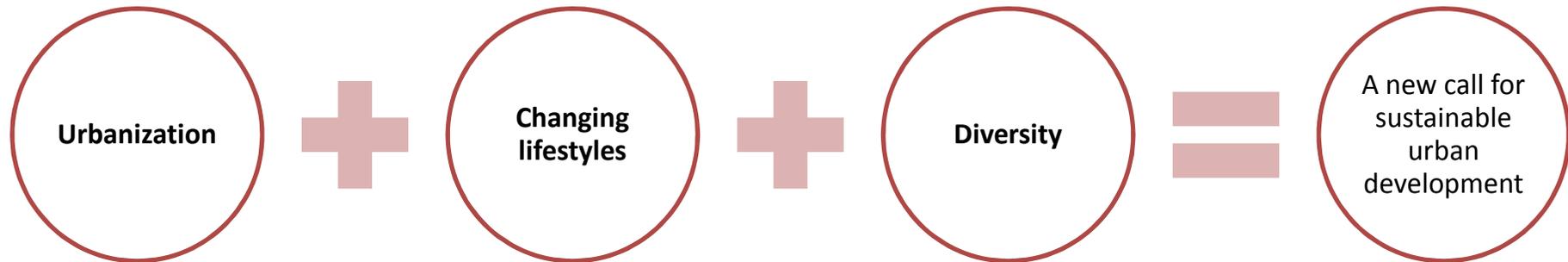
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REAL CORP paper presentation, 16 May, 2012

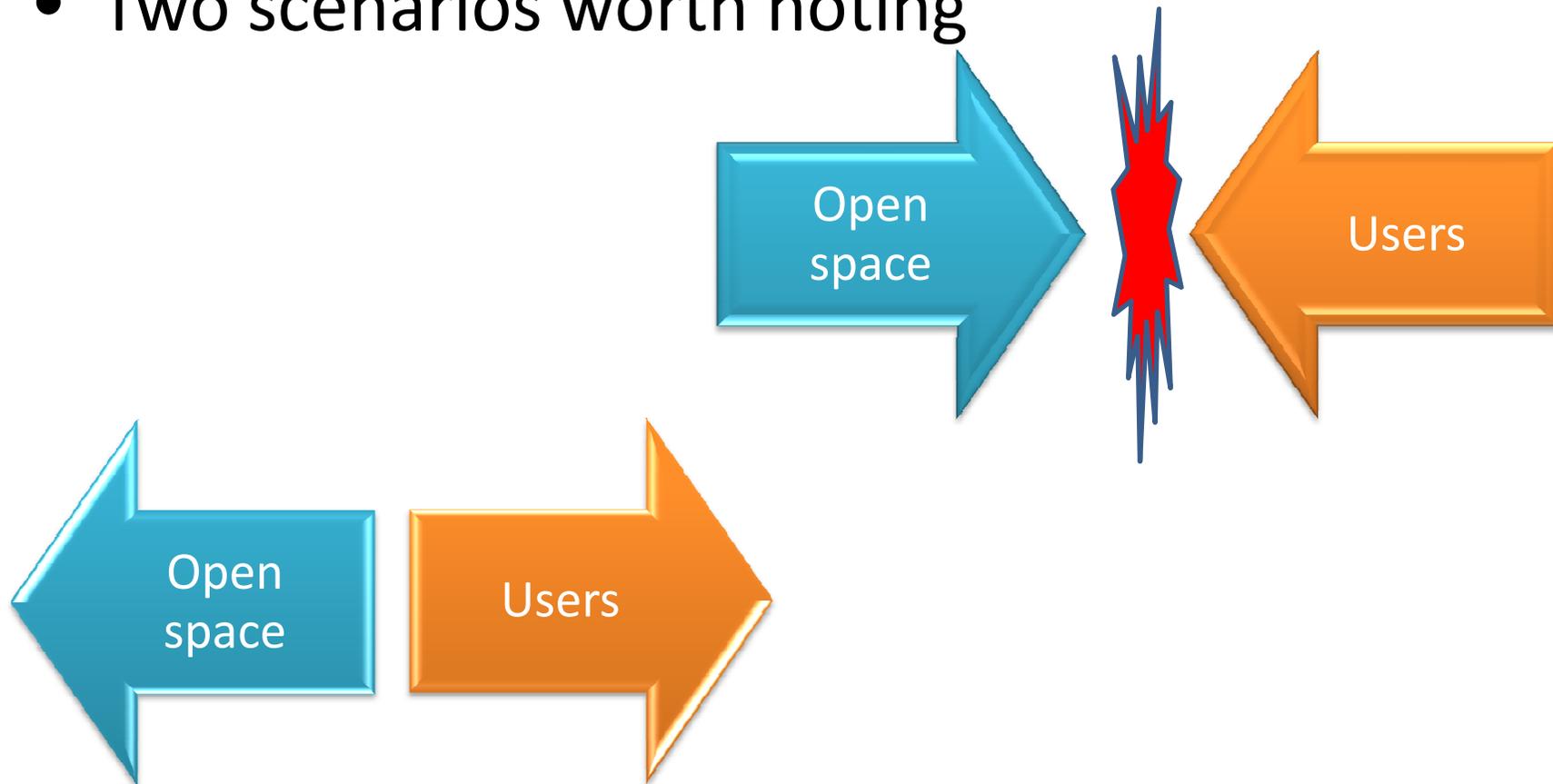
# Introduction and background



- Urban planning practices of many cities are in constant mutation owing to a myriad of driving forces.
- Planning and management of urban greening is of utmost significance to urban sustainable development
- With this new thinking, it is also strongly believed that developing more sustainable cities is not just about improving the abiotic and biotic aspects of urban life, it is also about the social aspects of city life (Mahdavinejad and Abedi, 2011).
- Such a social focus encompasses among other aspects people's satisfaction, experiences and perceptions of the quality of their everyday environments (Chiesura, 2004).

# Public open space versus space users

- What Urbanization has created
- Two scenarios worth noting



# The challenge

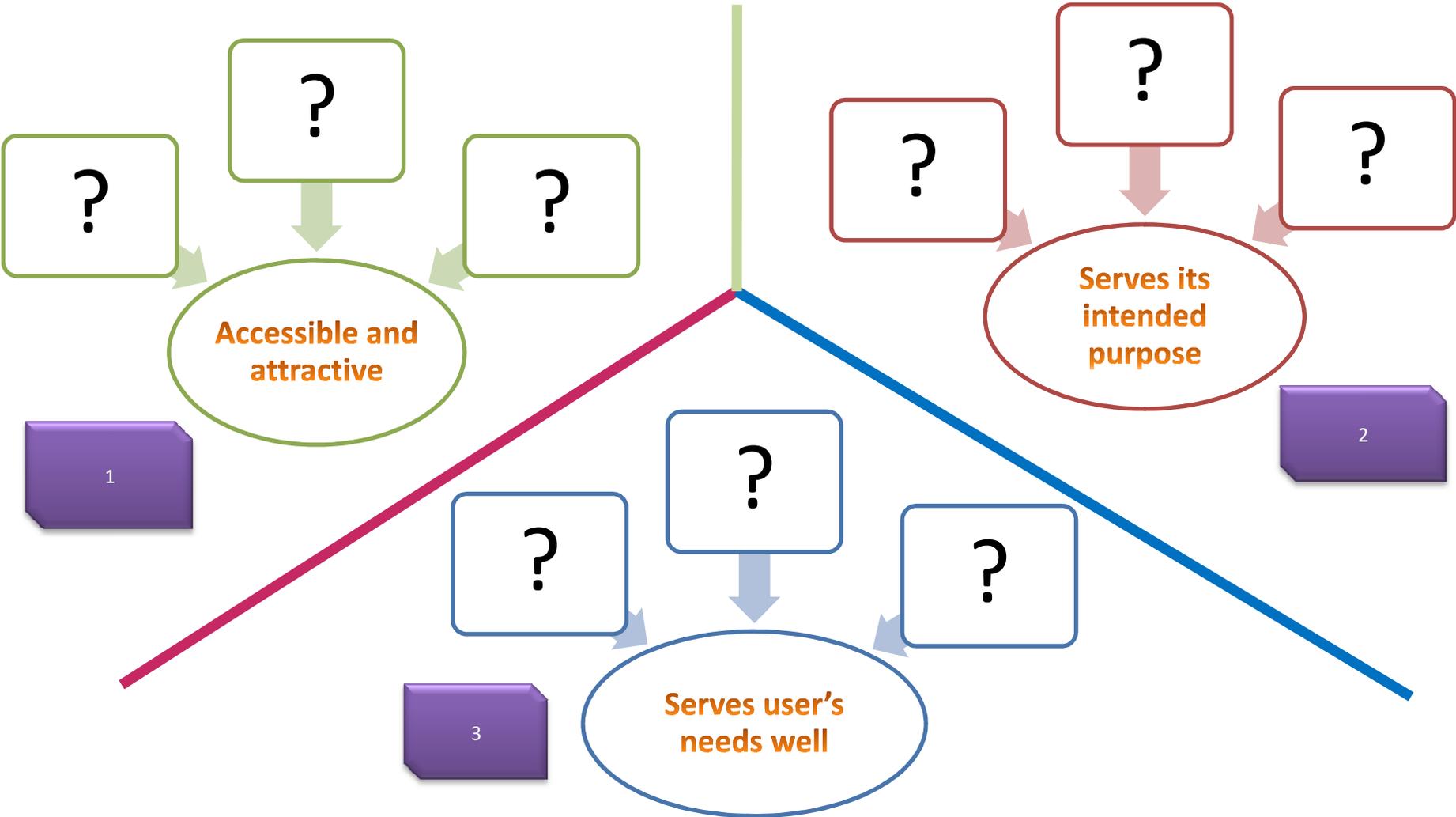
- The design of public and green spaces has emerged and one important area of particular interest for landscape architects and planners in recent years (Oguz, 2000; Chiesa, 2004).
- It is now believed that sustainability indicators for urban development should include more parameters about public spaces and green open areas, as well as indexes reflecting citizens' satisfaction and perception of their living environments (Chiesa, 2004).
- A number of challenges that confront spatial planners and / or urban designers in creating inclusive urban spaces for contemporary and future use have however been noted. scholars

Urban designers are still far from finding answers to the following daunting questions;

- How well to predict the use of spaces they have created?
- How certain they can be that a place designed for certain types of activity and occupation will serve its users' needs well?

**HOW TO CREATE URBAN SPACES THAT ARE SUSTAINABLY ACCESSIBLE ?????**

# Defining sustainable accessibility



# Study Purpose

- This analysis sought to assess the accessibility and attractiveness of public open spaces in a sample of FOUR cities and / or towns in Ethiopia.
- It also sought to decipher factors that explained the current level of accessibility to public openspaces.
- Open spaces are in this analysis refer to recreational facilities such as public parks, playgrounds and amusement centers and residential gree space.

# The Method

- Observation was used as a way of understanding the interaction between people and space.
- In addition to observed behavior of space users as well as the recording of size and typology of public open space facilities, a questionnaire was administered to a sample of random observed space users.
- This was done to comprehensively capture both that passive and active interaction between people and space.
- A total of 451 questionnaires were administered with the help of Urban Management Masters (UMM) students at the Ethiopian Civil Service University (ECSU) in 2009.
- Such a survey was conducted in four selected cities and / or towns – including the capital city of Addis Ababa, the city of Dire Dawa, and the two towns of Nekemte and Chancho.

Name of City / town	Number of surveyed open space users	General characteristics of city / town	Urban landscape characteristics
Dire Dawa	<b>112 observed space users surveyed in the city's 5 out of 9 kebeles</b>	It is the second biggest city (after Addis Ababa – the capital). The total urban population is 232 854 inhabitants.	<b>Dire Dawa covers a total area of 128 802 hectares of which 2 684 hectares is urban.</b>
Nekemte town	<b>100 observed space users surveyed in the town's 7 out of a total of 12 Kebeles</b>	It is the administrative capital of Wellega zone in Oromia Regional State. The town is 331km away from the country's capital Addis Ababa. Its population stood at approximately 76 817 in 2009.	<b>According to the current urban master plan, the town occupies 3 192 hectares of land of which 627 hectares is urban land. Urban agriculture constitute 1.24% of urban land; Urban forest 32.5 percent; Open space 5.6%, Sportfields 0.5%; the built environment 60.1%.</b>
Chanco town	<b>67 observed space users surveyed in the town's 3 out of a total of 5 kebeles.</b>	It is the administrative capital of Gololcha Woreda in Oromia Regional State. The town is located 307 km to the South-East capital city of Addis Ababa According to the CSA report of 2007, the town's gross population density stood at 1641.1 people per km <sup>2</sup> .	<b>The town covers approximately 493 hectares of land.</b>
Addis Ababa	<b>172 observed space users surveyed in a sample of kebeles of the city's 3 out of 10 subcities of Yeka, Lideta and Bole</b>	It is the capital city of Ethiopia. The estimated total population of the city in 2008 was 2 738 248 (FDREPC, 2008).	<b>?</b>

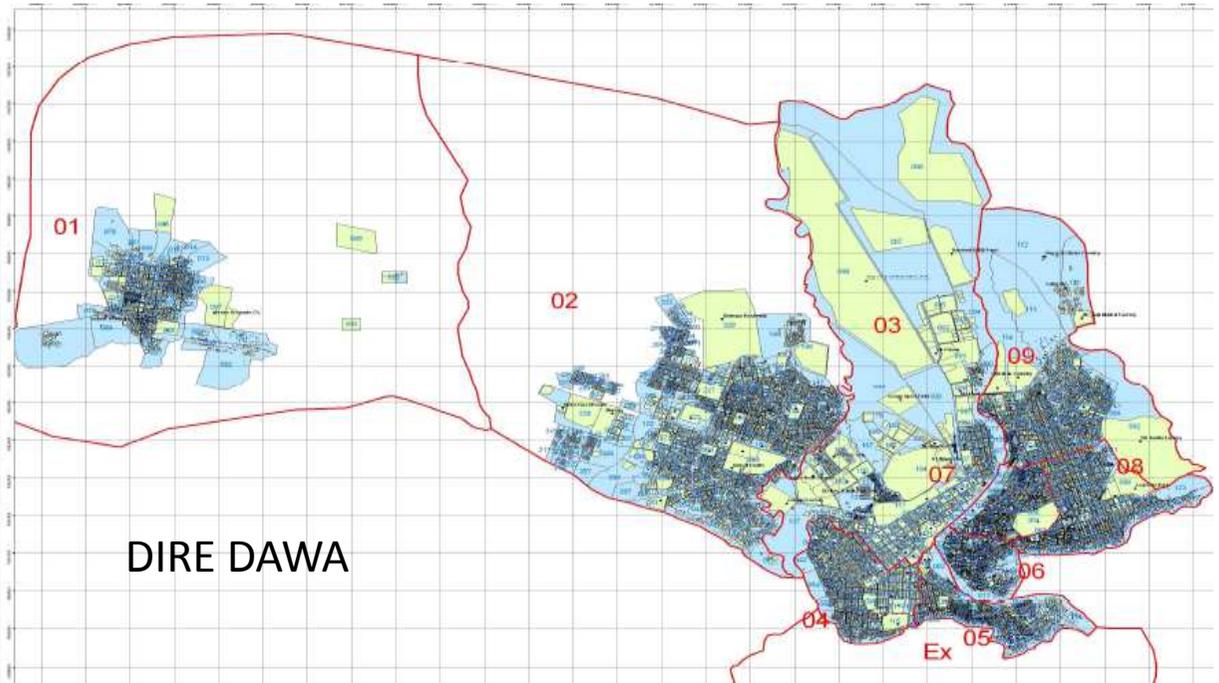
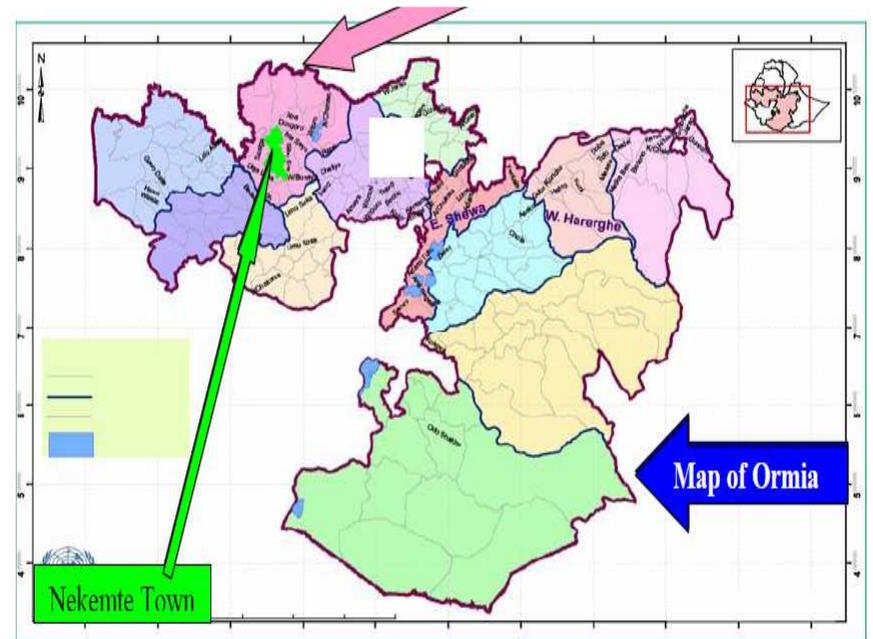
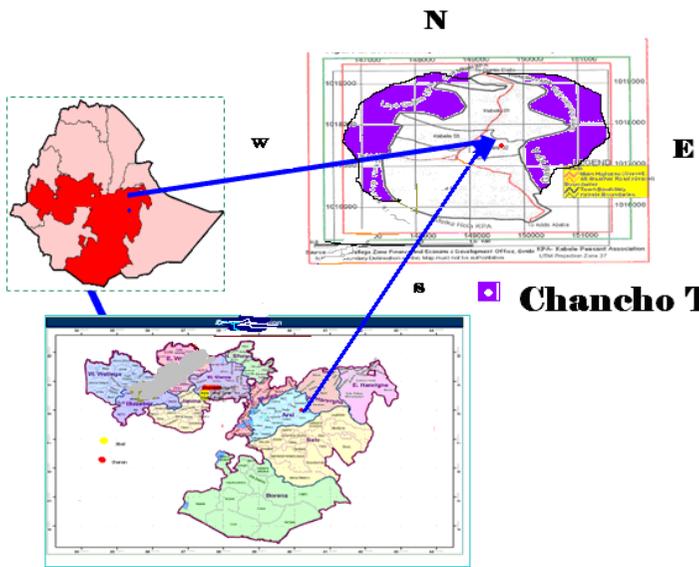
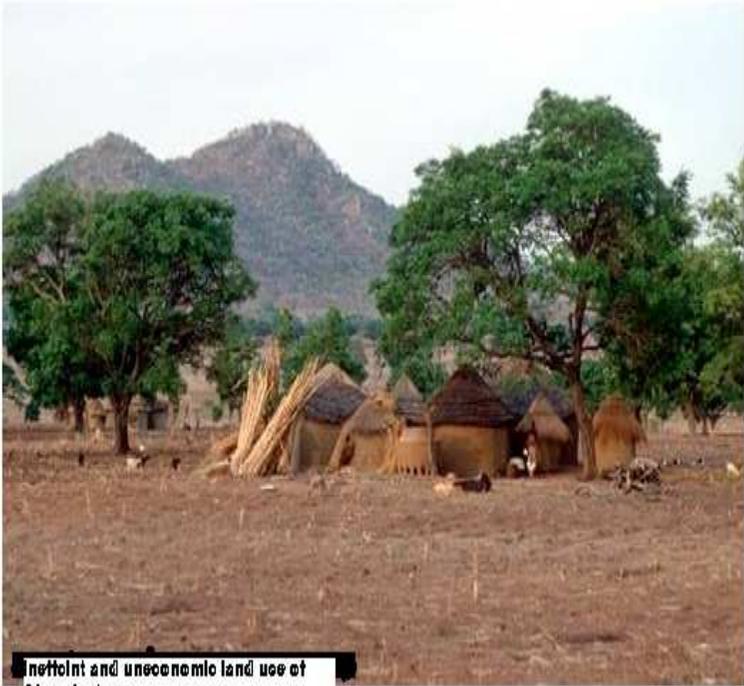


Figure 4.3. Some views of Mahlet recreational park





**Chancho Town Expansion Areas**



inefficient and uneconomic land use of Chancho town 2009



# Empirical model specification

The adopted model assumed the following statistical formula;

$$Y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_6 + \beta_7x_7 + u_i$$

Y = Probability of an urban citizen agrees that the surrounding public spaces are accessible (i.e. probability / Agree = 1)

X<sub>1</sub> = Type of user (1 = occasional user; 10 = frequent user)

X<sub>2</sub> = Typology of public space (3 = public parks; 2 = playgrounds; 3 = residential green spaces)

X<sub>3</sub> = Size of parcel (1 = small; 10 = large)

X<sub>4</sub> = Observed open-space function (0 = serving its purpose; 1 = not serving its purpose)

X<sub>5</sub> = Income status (0 = low; 1 = high)

X<sub>6</sub> = Distance to open space facility (0 = next to neighbourhood; 10 = far away from neighbourhood)

X<sub>7</sub> = Size of urban area (population equivalent on a 5 point likert scale; 1 = small / Chanco town; 5 = large / Addis Ababa)

X<sub>8</sub> = Aesthetic appeal / attractiveness of open space (0 = less appealing / attractive; 10 more appealing / attractive)

## Model Evaluation

□ Parameters in logistic regression model were estimated using the maximum likelihood method. The statistical significance of each coefficient was evaluated using the Wald test. The enumerated regression coefficients represent the change in the logit of the probability from a unit change in the associated predictor, assuming other factors are constant. The goodness-of-fit test of the regression model in this study was analyzed using;

1. The **Omnibus test**, which is a likelihood ratio chi-square test that test whether the coefficients of the variables in the model are all jointly equal to zero.
2. The **Hosmer & Lemeshaw (H-L)** goodness-of-fit test, which examines the null hypothesis that the model adjust well to the data and
3. The **Cox and Snell (1989) and Nagelkerke (1991)** – two descriptor measures that reveal the amount of variation in the outcome variable that is explained by the models (Long, 1997; Hosmer and Lameshaw, 2000).

# Results and Discussion

	B	S.E.	Wald	Df	p-value	Exp(B)
Type of user	.027	.934	.001	1	.977	1.027
Typology of public space	-.560	.234	5.750	1	.016	.571
Size of parcel	-.655	.245	7.140	1	.008	.519
Observed open space function	-4.961	.842	34.725	1	.000	.007
Income status	2.837	.520	29.787	1	.000	17.068
Distance to open space facility	-2.500	.510	24.008	1	.000	.082
Size of urban area	-.018	.414	.002	1	.965	.982
Aesthetic appeal / attractiveness	2.947	.456	41.811	1	.000	19.054
Constant	3.249	1.174	7.658	1	.006	25.774

Table 2. Test parameters for the binary logistic model.

# Results and Discussion

- Results reveal that out of the 451 surveyed urban inhabitants in four sampled cities and / or towns of Ethiopia, a total of 80.3 % believed that public open spaces were not easily accessible.
- People who regularly use observed public open spaces were 1.027 times (ie. Exp B = 1.027) more likely to agree that such facilities were easily accessible than those who seldom use them.
- Accessibility to public open spaces was also found to vary significantly with the typology of public space ( $p < 0.05$ ). The negative beta estimate reveals that public parks were dismissed as highly inaccessible (in relative terms) as compared to play grounds and residential green open spaces.
- Another significant factor ( $p < 0.01$ ) was the size of the observed size of the land parcel. Large public open space facilities were largely dismissed as inaccessible when compared with small ones ( $\beta = - 0.655$ ).

# Results and discussion

- Study results also revealed that about 31, 9% of the sampled respondents were using public open spaces where elements of serving an unintended function were observed and recorded. Such unintended functions included illegal disposal of solid waste, unauthorized urban farming activities, illegal structures (housing and informal business) and livestock grazing.
- The binary logistic results revealed that respondents who were observed using public open spaces which had an element of not serving the intended purpose were 0.007 times more likely to dismiss the concerned parcel as inaccessible. Such a finding was very significant ( $p < 0.001$ ).
- Open space users who belonged to a low income bracket were 17.068 times more likely to dismiss the public open space more inaccessible than those who occupied the high income bracket.
- As expected, open space users who defined surrounding public open spaces as being far away from the own neighbourhoods were 0.082 times more likely to dismiss such facilities as more inaccessible than those who felt that such facilities were within reach ( $\beta = -2.5$ ;  $p < 0.001$ ).
- Users from the much bigger cities of Addis Ababa and Dire Dawa were more likely to identify their public open spaces as inaccessible than those who came from the much smaller towns of Nekemte and Chancho. These results were however not significant ( $p > 0.5$ ).



# Results and discussion

- Another significant factor ( $p < 0.001$ ) was the attractiveness and / or aesthetic appeal associated with the concerned public open spaces.
- Many users felt that the public open spaces were less attractive and less aesthetically appealing.
- Since the beta estimate is positive, such users were 19.054 times likely to dismiss such public facilities as inaccessible more than those who thought otherwise. Several reasons were advanced. Most users felt that the bulk of public open spaces were not monitored and maintained regularly. Most facilities were characterised as dirty owing to indiscriminate disposal of solid waste. The supportive infrastructures such as access roads, equipment for public toilets and water taps was also reported to be in dire state.

# Concluding remarks

- Using accessibility to public open space facilities as a predictor variable, this analysis sought to assess the extent to which a sample of four Ethiopian towns and / or cities were designed according to human scale and other aspirations.
- Results revealed that most public open spaces are less attractive and difficult to access.
- At a more general level, three major factors are to blame. These include absence of a land use (re)mixing strategy, weak development controls that have seen some open spaces giving way to illegal land uses and the general absence of quality infrastructure in existing open spaces.
- The most affected households reside in poor neighbourhoods. Only a spatial planning strategy that is guided by a known land use (re) mixing strategy would ensure improved accessibility to open spaces.
- Such an effort however needs to be complemented by strategies that strive to strengthen the current development control mechanisms and the fortressing of open spaces that are under immense pressure from other competing uses.
- A major facelift on the attractiveness of existing open spaces through the provision of quality infrastructure is also required.

**THANK YOU FOR YOUR  
ATTENTION!!!**