

## Assessment of Opportunities and Challenges of Urban Forestry in Nawalparasi District, Nepal

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### Abstract

This article highlights a research carried out in Gaidakot municipality of Nawalparasi district, Nepal to evaluate the opportunities and challenges of urban forestry regarding identification of existing policies and documentation of institutions involved in the field of urban forestry. Systematic random sampling method was used for the data collection during household survey. The study revealed that urban forests are governed through the all-size-fits-all forest policies, which are not favorable to urban forestry development. Plantation in the barren lands, park development, social mobilization and awareness raising are the major activities of urban forestry. The research also showed that main opportunities of urban forestry development in the study area are newly formed local government, high level willingness of local people to participate in urban forestry development, and presence of community forests around the city. On the other hand, lack of public space, narrow roads, increasing fragmentation of land, and lack of coordinated and planned efforts are major constraints to urban forestry development. This study recommends that government should take necessary steps to establish the institutional setup to facilitate the urban forestry development programmes. For this, mobilizing social organizations could be an effective tool to promote urban forestry, but a long-term plan for plantation and their management needs to be in place.

### Keywords

Urban forestry; Policies; Opportunities; Challenges

## Introduction

Before the concept found broader acceptance and support, urban forestry was developed in North America during the 1990s as an innovative approach to manage natural resources in urban environment, and in Europe during 1990s. The role of urban forest in improving aesthetic quality, ecological maintenance, cleaning the air and modifying the temperature extremes has been pointed out by various researchers (Dwyer *et al.*, 1991; Keller, 1979; Negi, 1998; Ulrich, 1990). The list of goods and services that urban forestry can provide could be impressive. Trees and other vegetation intercept particles and gaseous pollutants (McPherson *et al.*, 1997). They help keep cities cool, act as natural filters and noise absorbers, improve microclimates, regulate runoff water, and provide habitats to number of animals in general and birds in particular. Trees contribute significantly to the aesthetic appeal of cities, thereby helping to maintain the psychological health of local inhabitants. Urban forestry protects soils and moderates harsh urban climates by cooling the air, reducing wind speeds, and by shading. In arid regions, forest shelter belts around cities help combat desertification and dust storms. The level of biodiversity of urban green areas is often surprisingly high, representing nature close to where people live (Konijnendijk and Randrup, 2004).

Urban forestry is still widely perceived as an activity that is aesthetically oriented and desirable, but not necessarily essential. This means that people in general are not properly aware of the importance of tree covers' existence in and around their living premises, which has resulted in less participation of people in urban forestry development. So, there is a need to assess the level of awareness among the people regarding urban forestry so that required programs could be implemented in time for the development of urban greenery in the valley of Gaindakot. Evaluation of existing institutions, participation level, people's attitude and perception will assist in finding out the existing hindrance for the practices of urban forestry, from which problems and prospects related to the development and sustainability of urban greenery can be analyzed (Bista, 2009).

With a case study of Gaindakot Municipality, this research explores, in particular, the constraints and opportunities of urban forestry in both the already urbanized and urbanizing areas. It suggests ways forward to tackle the constraints and capture the opportunities for the development of urban forestry. Gaindakot municipality area is developing as a city. Roadside plantation and park development activities are being carried out. This can be made more effective by raising awareness among people, and making policies to encourage them in planting trees.

## Materials and Methods

The study was conducted in ward number 2 and 17 of Gaindakot municipality in Nawalparasi district of Nepal. Total 80 respondents were selected for the household survey (40 from each ward) using systematic random sampling. The perception of the respondents on the urban forestry was also assessed by using Likert scale method (Likert, 1932). Likert scale is a psychometric scale that allows people to respond to questions of interest in order to measure people's attitudes (such as perceptions and attitude tests). For this study perceptions of respondents towards urban forestry were measured in Likert Scale format: strongly agree to strongly disagree (1-5).

### *Calculation of Weighted Mean*

The following formulae was used to calculate the weighted mean:

Weighted mean =  $\frac{\sum(w_i \cdot x_i)}{\sum w_i}$

Where,  $w_i$  = Respondents response in %

$x_i$  = Value assigned to Strongly Agree to Strongly Disagree

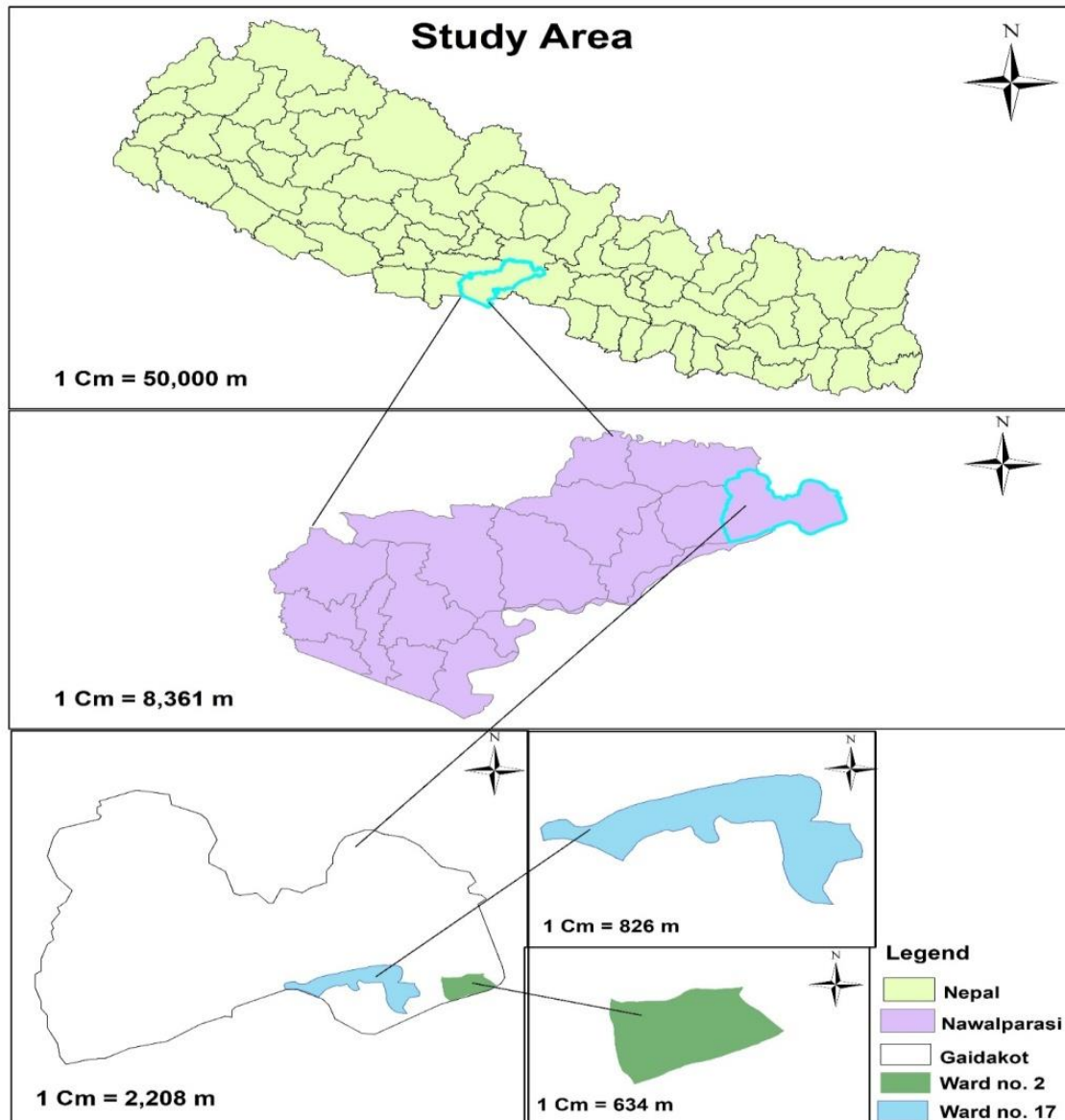


Figure 1: Map of Study Area

## Results and Discussion

The urban forests are governed through the all-size-fits-all forest policies, which are not favorable to urban forestry development. There are still some wards in Gaidakot municipality that are semi-urbanized and now can be planned in a way that create green space simultaneously with development activities. According to the local people, there is not any clear policy related to urban forestry in Nepal. Peri-urban forests, such as community forests around cities, have been managed under the forest laws that are equally applicable to all other forests. There is not any 'special'

provision for such forests in these laws. On asking the local people if they have knowledge about urban forestry, majority of them, that is 68.75%, told that they don't know about it, and 78.75% of them told that they don't know about the urban forestry policy.

According to some key personnel and leaders and urban forestry related institutions, forest policies and laws related to private forests are enforced at the time of harvesting trees from the private lands, including home yards; but there is hardly any provision to promote tree planting in home yards except seedling distribution. Gaindakot Municipality also does not have policy related to urban forestry. Interview with the Mayor, the key informant, suggests that the Municipality should plan to formulate a master plan for the forestry sector that will have special provisions for urban and peri-urban forest management. For instance, a mandatory provision of planting two trees per household can be one such provision. The view of both local people and institutions implies that one-size-fits-all policies cannot promote urban forestry; an explicit national level urban forestry policy framework and local level plans for developing and managing urban forests in public and private lands are necessary.

Among the various institutions working in the field of urban forestry in the study area are listed in the table below. These institutions have conducted different plantation programmes.

Table 1: Institutions working in the field of Urban Forestry

S.N.	Institutions
1.	Gaindakot Municipality Office, Department of Roads
2.	Temple service committees (e.g. Maulakalika temple, Shivalaya temple)
3.	Community Forest User Groups (CFUGs) (e.g. Narayani, Jayshree, Sundari and Jharekhola CFUGs)
4.	Social clubs (e.g. Khukuri Youth Club, Gaindakot Club, Sumina Club, Lions Club)
5.	Schools
6.	Other social organizations (e.g. Social Development and Research Center)

#### *Gaindakot Municipality: A Case Study*

Gaindakot Municipality Office has been conducting plantation and awareness raising programmes every year with the coordination of Department of Roads. The distribution of seedling and plant vase have been carried out in some areas, but it was inadequate in meeting the local demands. Municipality has been trying to make the mandatory rule of planting two trees per household in near future. The temple service committee including different temples such as Maulakalika and Shivalaya has conducted plantation around the temple premises. They normally prefer religious plants. Many community forest user groups have carried out management and protection activities of peri-urban forests and plantation in the barren lands in CFUG areas. Social clubs such as Khukuri youth club, lions club, Sumnima club, etc. have been carrying out plantation campaigns. Many schools and colleges were found carrying out plantation programmes inside their own premises. Many others social organizations such as Social Development and Research Centre has been carrying out awareness raising programmes about the importance and long-term benefits that we could gain from forest. There are various local social organizations and institutions working in the field of urban forestry in the study area, but most of their activities are limited to plantation as a

'fashion' and maintenance of those plantations is often ignored. Government agencies, including Municipality, forest agencies, Department of Roads, and business community have hardly participated in urban forestry development activities. Local social organizations are being involved in urban forestry development. Hence, mobilizing social organizations could be an effective tool to promote urban forestry, but a long-term plan for plantation and their maintenance needs to be in place. This case study clarifies that the Gaindakot Municipality plays proactive role to enhance urban forestry; however, it has been struggling with inertia and apparently intractable difficulties.

### *Opportunities for Urban Forestry*

The result of the research showed that there are several opportunities of urban forestry in the study area. Such opportunities are:

- People become aware about the importance of plants and are willing to participate in plantation activities.
- The number of community forests has increased.
- Inclusion of urban forestry development in local level government plan.
- Caring and proper management of the naturally regenerated trees.
- Involvement of local people in different greenery concerned organizations.
- Inclusion of urban forestry development activities while making plans for local, regional and national developments activities.
- Increased number of eco-clubs working in the field of urban forest.
- Identification of public and barren lands for sustainable planning and management of urban green parks and green spaces.
- The local level government is powerful, independent and resourceful for planning and implementing urban forestry activities. It can manage the semi-urbanized wards that leave certain spaces for greenery before any infrastructural development.
- There are remarkable number of community forests in the area which are well-managed
- High level of willingness of local people to participate in urban forestry development activities.
- Identification of fallow and barren land, which will be beneficial for the parks and green belt development.
- Increased number of eco-clubs can conduct more plantation activities.

Certain major opportunities of urban forestry in the study area are also shown figure 2.

### **Challenges for Urban Forestry**

From the research, it was found that there are several challenges of urban forestry in the study area, and they are:

- Lack of open public space for urban park development has been the main problem of the area due to rapid migration rate from other places of the country.
- Increasing land fragmentation causes the large plots of land to fragment into small plots. Large plots are used for farming, often without trees. The small plots with house do not

provide space for trees. So, 1-2 Kattha<sup>1</sup> of land seems to be optimal for raising trees in home yards.

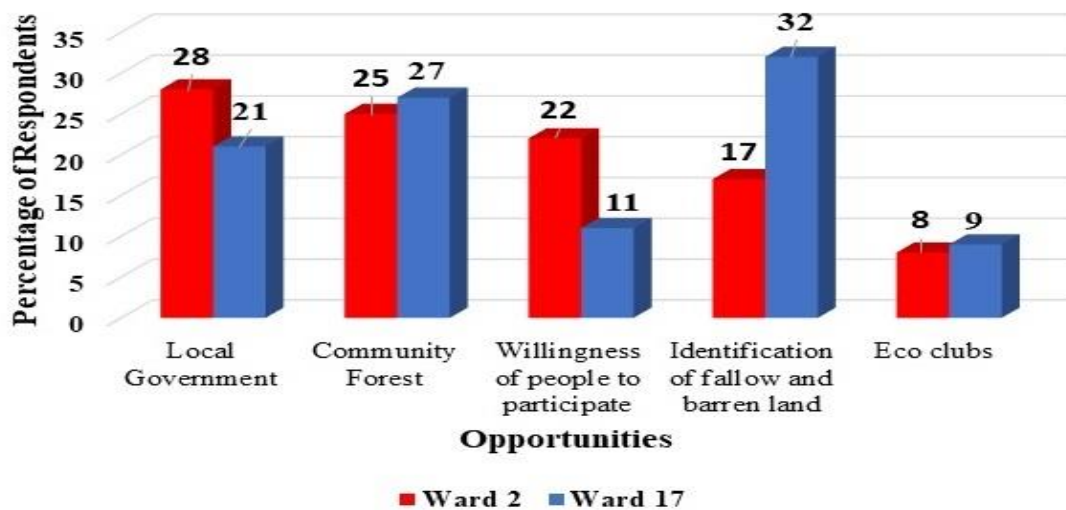


Figure 2: Opportunities of urban forestry

- Widening of roads has caused cutting of all the trees along roadside.
- Lack of knowledge about species selection makes the plantation activities unmanaged with a smaller number of beneficial trees economically or environmentally.
- Lack of appropriate policy and plans for urban development, i.e. haphazard urbanization. The unplanned urbanization of the city areas has caused problems of less space leading to a smaller number of parks and green belts.
- Contradiction between Nepal Forest Act 2049 (1993) and Local Governance Act 2073 (2016) on control over tree uses and maintenances etc.

The major five constraints of urban forestry development in the study area are shown in the following figure 3.

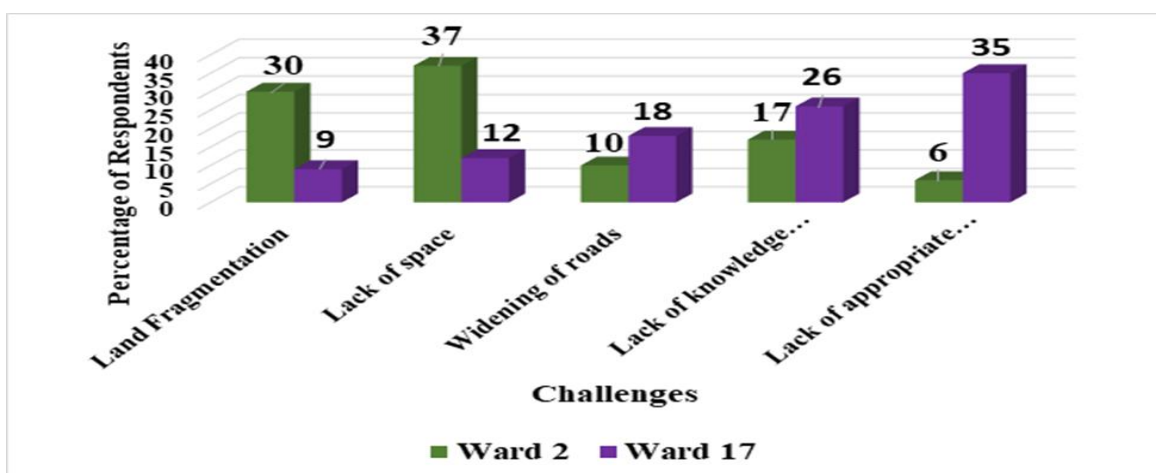


Figure 3: Challenges of Urban Forestry

<sup>1</sup>1 Kattha = 338.63 m<sup>2</sup>

Another important finding is based on the people's perception towards urban forestry, which was measured using Likert scale. It is listed in the table below:

Table 2: People's Perception towards Urban Forestry

Statement	Response (%)					Weighted mean
	SA (1)	A (2)	N (3)	D (4)	SD (5)	
1. Do you think trees in cities are beneficial?	66 (82.5%)	14 (17.5%)	0	0	0	1.175
2. Do you think trees in cities increase the beauty of that area?	75 (93.5%)	5 (6.25%)	0	0	0	1.06
3. Do you think trees in city area decrease the pollution and reduce the bad smell?	70 (87.5%)	10 (12.5%)	0	0	0	1.125
4. Do you feel there is lack in management of trees in city areas?	34 (42.5%)	40 (50%)	4 (5%)	2 (2.5%)	0	1.655
5. Is there an urgent need of starting urban forestry development activities?	48 (60%)	30 (37.5%)	1 (1.25%)	1 (1.25%)	0	1.437
6. Have you been involved in management of roadside trees?	3 (3.75%)	27 (33.75%)	0	38 (47.5%)	12 (15%)	3.362
7. Do you want to be involved in urban forestry development activities in future?	42 (52.5%)	30 (37.5%)	4 (5%)	3 (3.75%)	0	1.575
8. Do you think the number of trees planted in roadside are enough?	7 (8.75%)	4 (5%)	2 (2.5%)	30 (37.5%)	37 (46.25%)	4.075
9. Do you feel ownership in the trees that are present in front of your house?	23 (28.75%)	27 (33.75%)	8 (10%)	16 (20%)	6 (7.5%)	2.437
10. Do you think there is role of institutional involvement in the urban forestry development?	49 (61.25%)	29 (36.25%)	0	2 (2.5%)	0	1.437

Note: 1 – (SA) Strongly Agree; 2 – (A) Agree; 3 – (N) Neutral; 4 – (D) Disagree; 5 – (SD) Strongly Disagree.

Many of the respondents understand urban forestry as the plantation of certain number of trees in their home yard and Bari (farmland) and Khet (agriculture land) just for the purpose of shade, fruits and fodder. The trees in cities has not been understood as a component of city planning and its



importance is limited to the material benefits it gives to people. It cannot meet the objective of urban forestry. 80 respondents were interviewed to know their perception about the urban forestry and values from 1 to 5 were assigned from strongly agree to strongly disagree. The weighted mean was calculated to get the value, which was observed and the value near the assigned value was used as the result. The results are listed in the table 2. In the first statement, the weighted mean is 1.175, which is near the assigned value 1, i.e., strongly agree. Hence the maximum number of respondents strongly agree that the trees in the city areas are beneficial. Similarly, in the second statement, majority of the respondents (93.5%) strongly agree that the trees in cities increase the beauty of the area, 87.5% of the respondents strongly agree on the statement that the trees in the cities decrease the pollution and reduce the bad smell; 50% of the respondents agree on the statement that there is lack in the management of trees in the city area; 60% of the respondents strongly agree on the statement that there is a urgent need of starting urban forestry development activities. Majority of the respondents (47.5%) said that they have not been involved in the management of roadside trees; 52.5% strongly agree to involve in urban forestry development activities in future. Majority of the respondents (46.25%) strongly disagree to the statement that the number of trees planted in roadside are sufficient; 33.75% respondents agree that they feel ownership in the trees that are present in front of their house; 61.25 % of respondents strongly agree on the statement that there is a role of institutional involvement in the urban forestry development.

## Conclusion

The urban forestry has been a less prioritized sector in Nepal. Urban forests are governed through the all-size-fits-all forest policies, which are not favorable to urban forestry development. Gaundakot Municipality Office, Department of Road, and other community-based organizations (CBOs), including Community Forest Users' Groups (CFUGs), Temple and School Management Committees and Youth Clubs, have long been involved in urban forestry development. Yet, urban forests are not well-managed because of the lack of long-term plans.

The main opportunities of urban forestry development in the study area are:

- newly formed local government;
- high level willingness of local people to participate in urban forestry development; and
- presence of community forests around the city.

The main constraints to urban forestry development in the study area are:

- lack of public space;
- narrow roads;
- increasing fragmentation of land; and
- lack of coordinated and planned efforts.

## Recommendations

- With effective planning and clear vision, favorable policies and proper practices can create larger impact and achieve desired goal.
- Strong and effective public awareness is required.
- It is essential to establish substantial psychological connection between man and Mother Nature.



- There is a need to create platform for public to talk, share, debate, discuss and deliberate as much as possible on the questions related to urban forestry for innovation and overcoming challenges.
- Promotion of urban forestry as source of hazard mitigation is essential, as an urban tree can reduce storm water flow by intercepting rainwater on leaves and trunks.
- There is a need to incorporate more implementing partners like NGOs, academics, research institutions and environmentalists, with specific efforts to raise saplings at urban locations.
- Importance of green cover on either side of roads should be increased in urban areas.
- Long term plans and policies, like mandatory provision of planting two trees per household, and roadside plantations, should be made that ultimately improve the green space.
- Strengthening infrastructure for urban forestry measures is necessary.
- Required is the fund for maintenance urban trees (plant materials, installation, training, ownership building, etc.).
- Urban forestry comes with various benefits such as increasing the property value, lowering the temperature, minimizing the effects of harmful gases in atmosphere and providing shelter to various animals and birds.
- Specific expected outcomes to be achieved within measurable time period.
- Strengthen the policies and practices in implementation, adaptation, sustainability and replication of successful urban forestry.
- Address identified challenges at all levels, including planning, institutional issue and revenue deficit.

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