Public Perception and Institutional Involvement in Urban Forestry Development in Dhangadhi Sub-Metropolitan City, Sudurpaschim Province, Nepal

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KEYWORDS	ABSTRACT

Urban Forestry is an integral component of sustainable urban development, involving strategic administration of trees and green areas within urban environments. In this dynamic domain, institutional engagement is closely connected with local governments, sub-metropolitan offices, and division forest offices playing crucial roles in shaping policies and regulations. The significance of public perception in urban forestry practices cannot be overstated, as it shapes community involvement and endorsement for initiatives focused on improving environmental quality and urban well-being. The research aims to look into the public perception and institutional involvement in the development of urban forestry in Dhangadhi Sub-Metropolitan City, Sudurpaschim Province, Nepal. It seeks to assess the awareness levels of the residents regarding urban forestry initiatives and understand their perceived benefits and concerns. Simultaneously, the study will analyze the specific roles played by key institutions, including sub-metropolitan offices and division forest offices, in shaping urban forestry within the region. This paper is based on a household survey (n=210) and key informant interviews (n=7) representing the different institutions related to urban forestry. Roadside plantations, park and avenue plantations, as well as community forest management, were the major activities under urban forestry. Regarding the people's perception, the majority of the respondents (80%) were found to be aware of the advantages associated with urban forestry however only 35% of people were found engaged in urban forestry activities. Over the past few years, the local government has advocated for urban greenery. Despite these efforts, there is a lack of corresponding legislation or regulations specifically addressing urban forestry. Consequently, the effective management of city forestry demands concrete scientific and professional expertise.

INTRODUCTION

Urban Forest (UF) is defined as the whole canopy of trees, which consists of individual trees, groves, and patch forests on either public or private land, such as parks, streets, and other public areas, as well as residential

areas (Wolf & Kruger, 2010). Urban forests are generally regarded as crucial components for preserving the quality of urban life because they are said to yield a multitude of advantages, including a wide variety of environmental, urban landscape, economic, and psychological benefits. (Tyrvainen, 2001; Heynen & Lindsey, 2003; Jankovska et al., 2010). In light of these amenities, the idea of urban forestry, which refers to the planning, designing, planting, and upkeep of trees and forest stands in or close to urban areas, has evolved. (Nilsson & Randrup, 1997). Urban forests support sustainable urban growth by enhancing the standard of living and environment in cities (Konijnendijk et al., 2006). They excel environmentally by producing oxygen (Nowak et al., 2007), regulating temperatures (Ziter et al., 2019), managing storm-water (Berland & Hopton, 2014), and purifying the air (Nowak et al., 2013). They also play a significant part in reducing global warming since they have the ability to store carbon emissions from human sources. Poudyal et al. (2010). Economically, their positive correlation with increased residential property values highlights their financial impact (Dimke et al., 2013). Socially, urban forests provide increased opportunities for recreation (Voigt et al., 2014), reduce mortality (Donovan et al., 2013), and strengthen community bonds (Kuo, 2003). People's overall perception of urban forests is that humans often have a positive emotional connection to natural elements and they tend to choose environments that they perceive as naturally occurring (Balram & Dragicevic, 2005; Jankovska et al., 2010). It is important for natural resource management, particularly in urban areas, to take public attitudes and perceptions into account (Hansla et al., 2008; Larson, 2009; Schultz et al., 2005; Vaske & Donnelly, 1999) due to the possibility of competing interests between various public and private stakeholders (Nie, 2003). In such a dynamic environment of conflicting interests, better understanding of public sentiments can aid in

shaping management strategies Hansla et al. (2008), creating public awareness and outreach tools (Owens & Driffill, 2008), promoting sustainability Leiserowitz et al. (2006), and providing decision-makers with support (Jones et al., 2012; Moskell & Allred, 2013; Svendsen & Campbell, 2008)

In Nepal today, urban forestry is a new field gaining attention and has been practiced in the form of park construction in the country's metropolitan areas. Some examples of well-known parks are Ratna Park, Balaju Park, Tribhuwan Park, Sankha Park, Mitra Park, Godavari Park in Kathmandu, Sahid Smarak Park in Hetauda, and Fulbari Park in Butwal (Dhakal, 2019). Different parts of the government, non-profit groups, and private sectors are interested in promoting urban forestry, and legislation supporting these efforts is also in the early phase. According to the Forest Act (2019), local governments have the authority to independently or collaboratively develop and manage urban forests in areas like public roads and urban parks within their jurisdiction. The Division Forest Office or Sub-Division Forest Office is required to provide technical support and assistance for the establishment of these urban forests. The urban forest's products can be utilized by the respective local level as per prescribed regulations. Other than the national forest, the local government can develop, protect, and manage urban forests in public land according to the Forest Regulation 2022.

Despite offering a multitude of social, economic, and environmental functions, urban forestry in Nepal has received less academic attention than other forest regimes including leasehold forestry, community forestry, protected areas, and private forest. Therefore, the purpose of this study is to learn how the urban population in Dhangadhi sub-metropolitan city, Nepal, feels about urban forests and what role various organizations play in promoting urban forestry. Dhangadhi is one of the most populace cities and is rapidly urbanizing than the national average,

attributed largely to the migration from hills. The study of urban forests in this growing sub-metropolitan city is significant, as understanding the dynamics of urban forestry in a high-growth context can provide insights applicable to numerous urban areas facing similar challenges and opportunities arising from accelerated urban expansion and demographic shifts. The findings of this study will be instrumental in informing and guiding the concerned authorities to undertake appropriate measures for the development of urban forestry in the Dhangadhi sub-metropolitan city.

MATERIALS AND METHODS

Study area

This study was conducted in Dhangadhi sub-metropolitan city (28°42′ N Latitude and 80°35′ E Longitude) in Sudurpaschim Province, Nepal. An intensive study was conducted in 7 wards viz. 1, 2, 3, 7, 8, 15 and 17 among the 19 wards. The selected wards are the main city areas of the study area. They have a high population density of 759.5/km^2 and a rapid urbanization rate than the national average with 2.8% annual population change (Central Bureau of Statistics, 2022). The city occupies 261.8 square kilometers at a mean elevation of around 109 meters above sea level. Both the district's administrative and commercial hubs are located in this city.

Figure 1: Study Area Map

Data collection

Out of 21695 households (Census, 2021) of selected seven wards, 210 households were randomly selected for questionnaire survey (Gurung et al., 2012). Only those households situated close to the city area were selected for the research. Both open-ended and closed-ended questions were asked to the respondents to know their socioeconomic status (age, education, residency and occupation) and to gather general information about urban forestry to assess the level of awareness regarding urban forestry. A series of open-ended questions were asked to individuals selected for key-informant interviews. In a key informant survey (n=7), the study sought insights into various aspects of urban forestry, engaging with representatives from pertinent organizations such as government offices (division forest office, sub-metropolitan office, and ward offices), private nurseries, and non-government organizations. The discussion encompassed the various efforts undertaken by the organization to promote urban forestry, with a keen focus on activities tailored to enhance green spaces within urban settings. Furthermore, invaluable information was gathered regarding the specific species recommended and planted by the organization, contributing significantly to the enhancement of urban ecosystems and the level of local community involvement in urban forestry initiatives. Direct field observation was carried out mainly for park listing, documenting the roadside tree species, and also to assess the activities carried out by different institutions involved.

Data analysis

The perception of the respondents was measured in five-point Likert scale (Strongly Disagree to Strongly-agree (1-5) (Hermawan et al., 2023). The weighted mean was used for analyzing local people's perceptions regarding urban forestry (Johnson & Kuby, 2011).
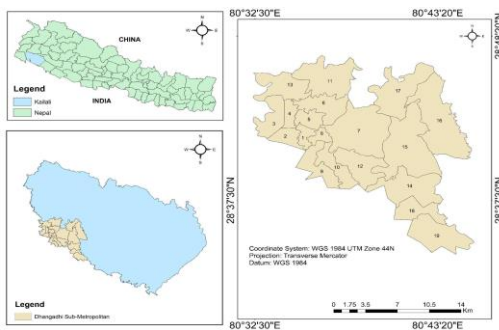
$$W= \frac{\sum_{i=1}^{n} wiXi}{\sum_{i=1}^{n} wi}$$

Where, W= weighted mean

n= number of terms to be averaged

wi= weights assigned to each respondent's perception

Xi= perception scores given by the respondents

RESULTS AND DISCUSSION

Socio-economic characteristics

Out of the total respondents (n=210), 64% were permanent residents and 36% temporary, 53% were males and 47 % were females. The age groups of 18-40 years (78%) and above 40 years (22%) were involved in the study. The majority of the respondents were educated: secondary level (47%), bachelor level (32%), and master level (8%). Only 13% of the respondents were uneducated. The socioeconomic status and profiles of the respondents are shown in Table (1)

Table 1: Socio-economic characteristics of the respondents

	Categories	%
Sex	Male	53
	Female	47
Age group	18-40 years	78
	Above 40 years	22
Education status	Secondary level	47
	Bachelor Level	32
	Master's Level	8
	Illiterate	13
Residency	Local	64
	Migrant	36
Occupation	Student	46
	Business	22
	Employee	15
	Wage labor/Unemployed	13
	Agriculture	6

Roadside plantation

For the city to stay green, roadside planting in the city has been established and sponsored by the ward offices, CFUGs, DFO, government organizations, private sectors, and educational institutions in Dhangadhi Sub-Metropolitan City. The Dhangadhi sub-metropolitan city has planted 3090 seedlings along the Bhansar to Geta road.

Knowledge about the benefits of urban forestry

The majority of respondents (80%) indicated that they were aware of the advantages of urban forestry. In contrast, 20% of respondents were unaware of these advantages of urban forestry. Additionally, it was found that respondents with education levels above higher secondary level had better knowledge of the advantages of UF and saw it as a crucial component of the creation of a sustainable urban environment.
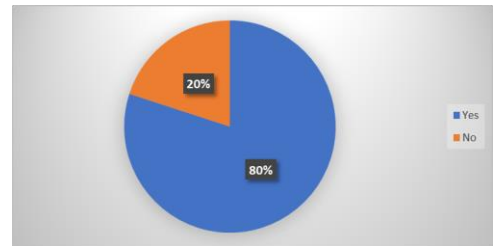

Figure 2: Knowledge about the benefits of urban forestry

Perceived benefits from urban forestry

Pollution control is viewed as the main benefit of the UF, according to the rank mean of 1.73 obtained from the respondents' responses. Similarly, ecological balance (2.14) and forest product (2.29) are ranked as the second and third most perceived benefits, respectively. Pedestrian shade (3.08) is evaluated as the fifth-ranked perceived advantage from UF according to the rank mean of the respondents' responses, which is displayed in Table (2).

Table 2: Perceived benefits from urban forestry

Benefits	Rank of respondent				Rank mean	Rank
	1	2	3	4		
Aesthetic	36	25	87	20	2.54	4
Pollution control	92	44	18	14	1.73	1
Shade to pedestrians	18	27	46	77	3.08	5
Ecological balance	41	83	24	20	2.14	2
Forest product	40	50	67	11	2.29	3

Land available for plantation in residential area

Only 29% of the respondents have enough space for plantation in their residential area, whereas 71% have limited area which makes it difficult to grow plants. With this limitation, respondents also believed that unavailability of open space as the greatest obstacle to urban forestry development in the city.
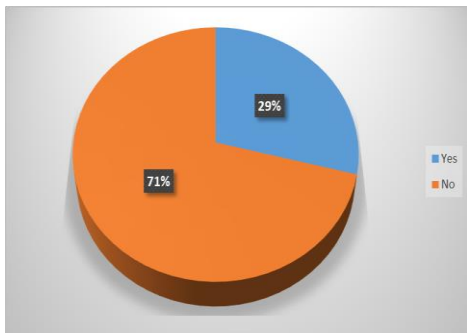

Figure 3: Response to land availability for plantation in residential area

Status of greenery in the surrounding area

55% of respondents identified a decreasing trend of greenery, 38% of them a growing trend, and 7% indicated no change (Figure 4).
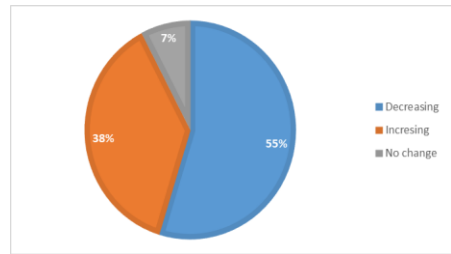

Figure 4: Response to the status of greenery in the city

Out of the 55% of respondents who reported that there is less greenery, 50% cited growing human settlement and population as the primary causes, 28% cited deforestation as the primary cause and the remaining 22% cited haphazard infrastructure development as shown in Figure (5).
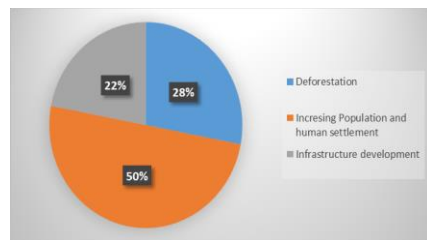

Figure 5: Decreasing cause of greenery

While 77% of the 38% of respondents who indicated that there is more greenery in the city cited afforestation and plantation activities as the primary cause, 23% thought that greater public awareness was the cause of the increased greenery.
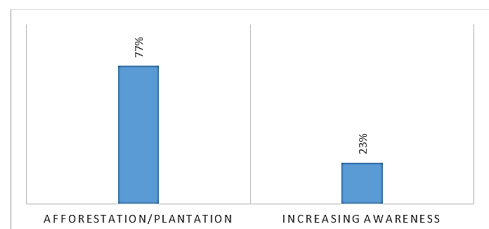

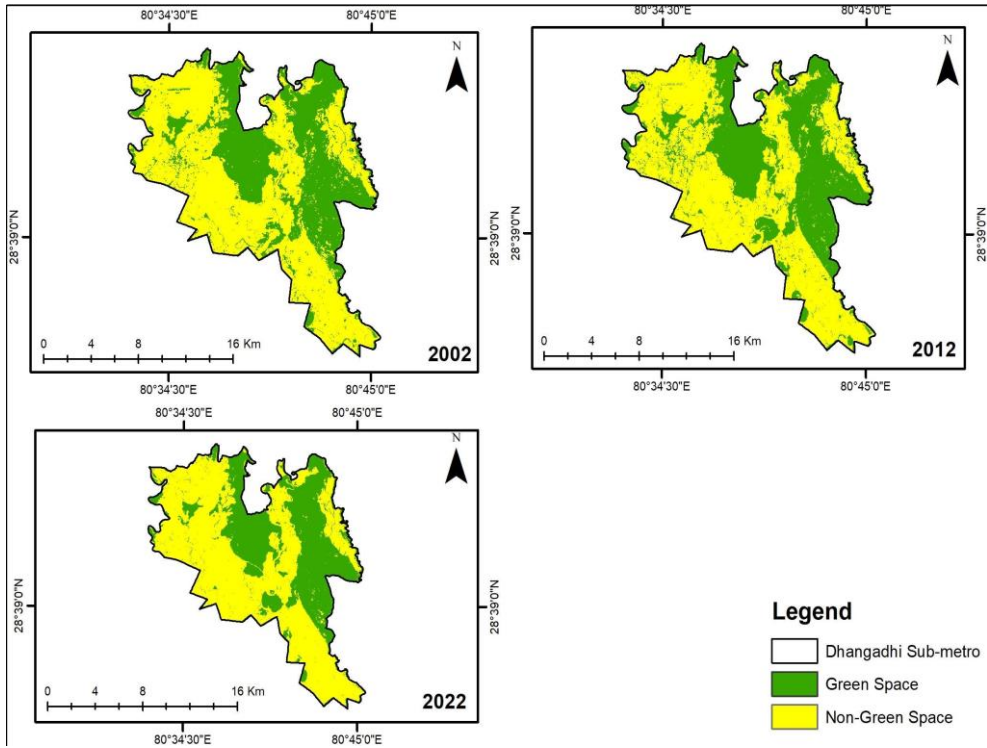**Figure 6: Increasing cause of greenery**

Figure 7: Greenery status of study area at three different time periods

Figure (7) illustrates the greenery status of Dhangadhi sub-metropolitan city at three different time periods viz. 2002, 2012 and 2022. Similarly, Table (3) shows the percentage of greenery changed over time. The greenery in the year 2002 was 40.21% which increased to 42.17% in the year 2012 following a minor drop to 38.42% in the year 2022.

Participation in urban forestry activities

We found that 35% of respondents had engaged in activities linked to urban forestry, while the remaining 65% had not as they lack a strong sense of ownership over their urban environment and also because of urban hectic life. This demonstrates the low degree of participation in urban forestry activities.

Table 3: Area statistics of temporal map

Status	2022		2012		2002	
	Area (Ha)	Percentage	Area (Ha)	Percentage	Area (Ha)	Percentage
Green	10024.04	38.42%	11003.37	42.17%	10492.76	40.21%
Non-green	16069.08	61.58%	15089.47	57.83%	15600.04	59.79%
Total	26092.80		26092.84		26092.80	

Participation with respect to age class, education status, and occupation

The majority of the respondents (69%) who have engaged in urban forestry activities are in the 18-40 age group. The table (3) shows the education level and occupation of the respondents who took part in urban forestry activities.

Table 4: Participation with respect to Age class, Education status, and Occupation

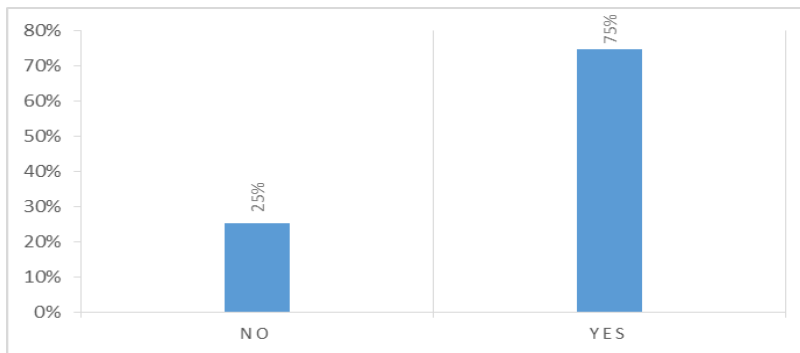| Category		% of Respondents participated in UF activity	Chi-square test
Age class	18-40 years	69%	There is a significant association between age group and participation (X^2: 3.9463, df = 1, p-value = 0.04697)
	40 above years	31%	
Education status	Bachelor's Degree	32%	There is no association between educational status and participation (X^2: 4.2447, df = 3, p-value = 0.2362)
	Higher Secondary	38%	
	Illiterate	7%	
	Master's Degree	9%	
	Secondary level	14%	
Occupation	Agriculture	11%	There is no association between occupation and participation (X^2: 7.9864, df = 4, p-value = 0.09208)
	Business	24%	
	Employee	18%	
	Student	35%	
	Wage labor/Unemployed	12%	

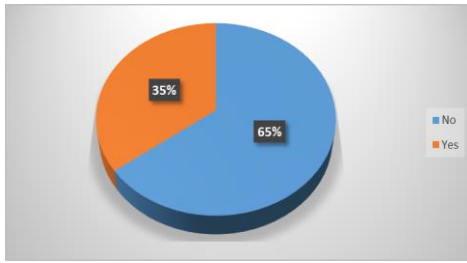**Figure 9: Plantation on private land**

Figure 8: Participation in urban forestry activities

Preferred species for plantation

Different people choose and prefer different species to be planted on their private property and in the area around it. Therefore, from the fieldwork interviews, it was discovered that 66% of respondents preferred fruit species, followed by 19% preferring ornamental species, 14% preferring shady tree species, and the remaining 2% preferring other species like medicinal plants and seasonal flowers.
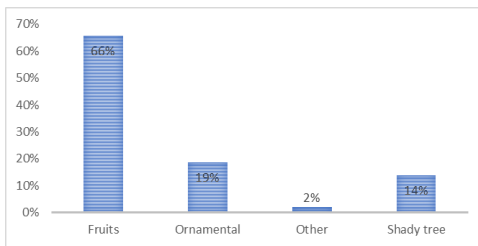

Figure 10: Preferred species for plantation

Activities for urban forestry development in the city

Thirty-three per cent (33%) of respondents stated that plantation activities should be considered the primary activities to be carried out as soon as possible for UF development. In addition, 32% of respondents stated that people must first be made aware of the importance of UF in the city.

Figure 11: Activities for urban forestry development in the city

Perception of people towards urban forestry

Respondents were asked to rate their level of agreement with statements about various aspects of urban forestry, using a series of Likert scales with ratings: 1="Strongly Disagree", 2="Disagree", 3= "Neutral", 4="Agree" and 5="Strongly Agree. To understand people's perception of urban forestry, the respondents were asked to rate the following statements and the results obtained from the analysis of the obtained data using the Likert scale are shown in Table 5.

Table 5: Statements for understanding perception towards urban forestry

Statement	Response of respondents					WM	Remarks
	1	**2**	**3**	**4**	**5**		
Trees in urban areas are beneficial to your health and life	0	0	14	84	112	4.47	Strongly agree
Trees in urban areas increase their beauty	0	0	0	80	130	4.62	Strongly agree
Trees in the urban areas reduce air pollution and bad smell	10	0	31	92	77	4.08	Agree
Maintenance and management of roadside trees in the municipality are poor	4	4	47	104	51	3.92	Agree
There is an urgent need to launch efficient urban forestry program in Dhangadhi	0	4	38	80	88	4.20	Agree
Satisfied with the existing status of urban forestry in Dhangadhi city	60	68	40	32	10	2.35	Disagree
Roadside plantations are necessary in the city	4	0	6	107	93	4.36	Strongly agree
There should be more trees along the roadside	0	12	43	121	34	3.84	Agree
People's participation is essential for urban tree management	0	0	0	50	160	4.76	Strongly agree
People feel ownership in roadside plantation.	44	94	34	20	18	2.40	Disagree

According to the findings in Table 5, it is clear that the respondents firmly believe that trees in urban areas improve not only health and quality of life (4.47), but also the aesthetic attractiveness of the city (4.62). They also believe that roadside plantations are essential for urban areas (4.36) and that citizens' participation is essential for efficient urban tree management (4.76). The respondents agree that trees in urban areas significantly reduce odors and air pollution (4.08). However, they express their disagreement with the municipality's poor maintenance and management of roadside trees (3.92), lack of an effective urban forestry program in Dhangadhi (4.20), and insufficient number of trees along roadside (3.84). According to the respondents, there is no sense of ownership of roadside plantations among residents (2.40). And they also express their dissatisfaction with the current state of urban forestry in the city (2.35).

Natural forests

There are altogether 33 CF within the sub-metropolitan area. Out of them, 12 community forests are located in the selected wards. These community forests cover 1079.91 hectares and serve about 3653 households in the sub-metropolitan. 28.57% of the respondents were the daily users of these community forests. These community forests have added extra beauty and greenery in and around the city area. People's reactions to community forestry in urban settings are frequently favourable, with acknowledgment of the many advantages it offers.

Riverbank plantation

Sissoo, Syzygium cumini, Bambusa, and Phyllanthus emblica plantations have been done along the Mohana, Khutiya Rivers and other streams. Different community forests have also planted different types of tree species along the rivers and streams located in their community forest.

Role of different institutions for urban forestry promotion

The expected role, existing role and gap for different institutions for urban forestry promotion were analyzed where expected roles and existing roles were based on questionnaire survey and key-informant survey respectively.

Table 6: Role of different institutions for urban forestry promotion

S.N	Institutions	Expected role	Existing role	Gap
1.	DFO	1. Provide technical advice on tree species selection, planting techniques, and urban forest management practices to local governments and communities. 2. Create and keep an extensive inventory of urban trees to track their diversity, growth, and health for planning and management purposes. 3. Work with community organizations, NGOs, and local government entities to advance urban forestry programs and create alliances for resource mobilization. 4. Conduct outreach activities to involve the neighborhood in tree care, promote tree planting campaigns, and inform urban inhabitants about the advantages of urban forestry.	1. Execute national forestry laws and rules pertaining to urban forestry. 2. Provide free seedlings.	1. Insufficient community involvement and participation in urban forestry initiatives 2. Insufficient funds and resources available for urban forestry projects and programs.
2.	Sub-metropolitan	1. Actively manage and preserve urban green spaces, such as parks, gardens, and roadside plantations. 2. Create and put into effect regional ordinances and policies that pertain to urban forestry and green infrastructure in their area of responsibility.	1. Frequently oversee urban parks and open areas 2. Implement national and local forestry policies 3. Initiate "One Ward, One Green Park" policy. Initiation.	1. Lack of finance, personnel, or equipment to manage and scale up urban forestry initiatives.
3.	Community Forest User Groups (CFUGs)	1. Actively take part in tree-planting campaigns in urban areas, ensuring the suitable species of trees are chosen and that they are maintained properly. 2. Interact with urban stakeholders, residents, and communities to inform them of the advantages of urban forestry and involve them in activities like tree planting and upkeep. 3. Increase the skills of CFUG members and urban inhabitants in urban forestry management, tree maintenance, and planting methods.	1. Roadside plantation, park establishment, riverbank plantation.	1. Lack of knowledge and experience necessary to handle the special potential and problems of urban forestry. 2. Difficulty to gather resources and secure funding for urban forestry projects.
4.	Non-government organizations	1. Promote urban forestry and educate the public on the value of trees and green space in urban settings. 2. Offer training and capacity-building programs for local communities, government representatives, and other stakeholders on urban forestry techniques, such as tree planting, care, and management. 3. Collaborate with government agencies, local municipalities, community groups, and other NGOs to implement urban forestry projects.	1. Actively bring urban forestry and other environmental issues to public's attention. 2. Frequently promote green space inclusion and sustainable urban development.	1. While NGOs promote urban forestry and create public awareness of it, there may be a gap in their ability to have an impact on government policies and regulations in this area.
5.	Private sector	1. Incorporate green infrastructure components, such as sustainable landscaping and green walls, roofs, and walls into their projects and enterprises, like building real estates. 2. As part of corporate CSR initiatives, they should devote resources and personnel to urban forestry projects, promoting environmental sustainability.	1. Private businesses maintain green areas on their corporate grounds, but they rarely participate in broader urban forestry initiatives.	1. There is a need to educate the private sector about the advantages of urban forestry and inspire them to take an active role in planting and caring for urban trees.

DISCUSSION

Out of all the interviewed respondents, 64% were permanent residents whereas 36% were temporary, which differs from the study of Blazevska et al. (2012) where 100% of the respondents were permanent residents of the city. The majority of respondents (80%) said that they were aware of the advantages of urban forests, which supports the research of Gurung et al. (2012). In contrast to findings of Bista (2009), who found ecological balance as the key benefit perceived in his research, pollution control is regarded as the main benefit perceived by the UF. Whereas, Hauru et al. (2015) found psychological restoration (at a personal level) and recreational experiences (at a societal level) as the major benefits residents perceived from urban forests. According to the respondents, the limitation of open space is obstructing the development of urban forests in the city, which contradicts with the findings of (Kabisch et al,, 2016), who found 41% share of open space in the city for urban green species and Chaudhry et al. (2011), who stated high population density as one of the reasons for the underdevelopment of urban greenery sector. 55% of respondents believe that the city's greenery is declining due to increase in population and human settlement. These findings are consistent with those of Sedhain (2010), Gurung et al., (2012), and Idris (2022). However, Tan et al. (2013) discovered the restoration of forest cover that had been lost due to urbanization and agriculture through managed vegetation in the form of urban green spaces. People's dissatisfaction with the city's current UF situation is consistent with the findings of (Gautam et al., 2006) and Dhakal (2019). This study concluded 35% involvement of the respondents in urban forestry activities, which is similar to the finding of the studies by Bista (2009) and Lamichhane and Thapa (2012), which showed there is little public participation in urban forestry initiatives. According to Faleyimu (2014), majority of respondents planted trees in the vicinity of

their homes to serve as a source of fruits, nuts, and vegetables, which is consistent with the results of this study. A major proportion of respondents prefer fruit species for plantations in their vicinity. This concurs with the finding of Xie et al. (2022), who stated fruit-bearing shrubby plants as the primary preference of residents. Making strategies and organizing different activities that are realistic and well-supported by the general population is essential for the sustainable growth of urban forestry. For the development of urban forests, 33% of respondents said that plantation activities should be the primary activity and should be carried out as soon as possible. This finding is consistent with that of (Bista, 2009) and (Devkota, 2018), but it is at odds with that of (Wirtz et al., 2021), who cited financial resources as most crucial element. In accordance with the findings of Lamichhane and Thapa (2012), the study concluded that UF is poorly organized and that people are very interested in participating in UF events. Majority of the respondents are not satisfied with the existing status of urban forestry in Dhangadhi whereas (Blazevska et al., 2012) revealed 73.8% of respondents were satisfied with the current situation of urban forests in their place of living. This study shows that 28.57% of respondents are daily users of the nearby community forest which corroborates the findings of (Hauru et al., 2015). They found that 32% of the respondents used their nearby forests daily in summer and 20% in winter. Similar to the sub-metropolitan office in Dhangadhi, the sub-metropolitan office in Lalitpur has created Manmohan Park and Shahid Smarak Park (Sedhain, 2010) and has done roadside planting on either side of the road that runs from Kupondol to Jawalakhel to Satdobato. The Forest Act 2019 and Regulation 2022 have the provision to develop and manage urban forests in areas like public roads and urban parks. Similar to the initiative "One Ward, One Green Park" policy of the Dhangadhi sub-metropolitan office, the Bharatpur metropolitan office began implementing "One Ward, One

Garden, One Ward, One Pond, and "One House, One Tree" policies (Dhakal, 2019).

CONCLUSION

Due to population growth, deforestation, and unplanned development, the amount of greenery in the city is declining in comparison to a few years before. The majority of people are aware of the advantages of urban forestry, but they are dissatisfied with the state and types of trees that are already present. People believe that the lack of land restricts the growth of urban forestry in the city. Roadside avenues, river banks, playgrounds, and office complexes are currently reported to be key plantation locations. Community Forest User Groups (CFUGs) are contributing to urban forestry through different activities such as roadside plantation, park establishment, riverbank plantation, and conducting awareness programs. Different NGOs and private sectors have contributed to the development of urban forestry by providing financial support. NGOs, CBOs, and the corporate sector are collaborating with the government to increase the amount of green space in the city of Dhangadhi. However, none of them were discovered to be completely devoted to UF, instead making sporadic efforts to further its advancement. The sub-metropolitan region should designate urban forestry as a priority sector and implement green structural planning for the city area.

ACKNOWLEDGMENT

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ANNEX:

Major species along the roadside

S.N.	Local Name	Scientific Name	Family
1.	Pipal	*Ficus religiosa*	*Moraceae*
2.	Gulmohar	*Oelonix regia*	*Fabaceae*
3.	Neem	*Azadirachta indica*	*Meliaceae*
4.	Litchi	*Litchi chinensis*	*Sapindaceae*
5.	Kalkiphul	*Callistemon viminalis*	*Myrtaceae*
6.	Aap	*Mangifera indica*	*Anacardiaceae*
7.	Ashok	*Saraca asoca (indica)*	*Legumes*
8.	Jackfruit	*Artocarpus heterophyllus*	*Moraceae*
9.	Kapoor	*Cinnamomum camphora*	*Lauraceae*
10.	Birendraphul	*Jacaranda ovalifolia*	*Bignoniaceae*
11.	Bakaino	*Melia azedarach*	*Meliaceae*

Tree species sited in parks

SN	Plant Species	Botanical Name
1	Ipilipil	*Leucaena leucocephala*
2	Toothed Dock (Baspate)	*Rumex dentatus*
3	Malaysian Sal	*Moringa olifera*
4	Rittha	*Sapindus mukorossi*
5	Gulmohar	*Delonix regia*
6	Kalo Siris	*Albizia chinensis*
7	Amaro	*Spondias pinnata*
8	Amriso	*Justicia adhatoda*
9	Sisso	*Dalbergia sisso*
10	Bakaino	*Melia azadirachta*
11	Amala	*Phyllanthus emblica*
12	Parijat	*Erythrin astricta*
13	Beth	*Calamus acanthospathus*
14	Tejpatta	*Cinnamomum tamala*
15	Sindhur	*Bixaore land*
16	Kalo koiralo	*Bauhinia species*
17	Seto koiralo	*Bauhinia varieagata*
18	Taaki	*Bauhinia malabarica*
19	Golden Dhupi	*Thuja orientalis*
20	Bhalu bas	*Dendrocalamus species*
21	Kade bas	*Bambusa spinosa*
22	Kapur	*Cinnamomum camphora*
25	Neem	*Azadirachta indica*
26	Supari	*Areca catechu*
27	Mangosteen	*Garcinia mangostana*
28	Mangosteen	*Garcinia mangostana*
29	Mangosteen	*Garcinia mangostana*
30	Litchi	*Litchi chinensis*
31	Mango	*Magnifera indica*

32	Guava	*Psidium guajava*
33	Kg Guava	*Psidium guajava*
34	Pine apple	*Ananas comosus*
35	Jackfruit	*Artocarpus heterophyllus*
36	Rani Bel	*Aegle marmelos*
37	Jamun	*Syzygium species*
38	Gulab Jamun	*Syzygium jambos*
39	Lemon fruit	*Citrus limon*
40	Pomegranate	*Punica granatum*
41	Khajuri Palm	*Phoenix dactylifera*
42	Tiger Palm	*Pinanga maculata*
43	Foxtail Palm	*Wodyetia bifurcata*
44	Chinese Palm	*Livistona chinensis*
45	Bottle Palm	*Hyophorbe lagenicaulis*
46	Neelkantha phool	*Clitoria ternatea*
47	Kapro	*Castonopsis indica*
48	Bar	*Ziziphus mauritiana*
49	Pipal	*Ficus religiosa*
50	Shami	*Prosopis cineraria*
51	chuiri	*Diploknema butyracea*
52	Orange	*Citrus sinensis*
53	Kumquat	*Fortunella japonica*
54	Ashok	*Saraca indica*
55	Loquat	*Eriobotrya japonica*
56	Kimbu	*Morus alba*
57	Harro	*Terminalia chebula*
58	Barro	*Terminalia bellirica*
59	Sitaphal	*Annona reticulata*
60	Avocado	*Persea americana*

List of different preferred species

Fruits species	Scientific Name
Lemon	*Citrus limon*
Papaya	*Carica papaya*
Banana	*Musa sps*
Guava	*Psidium guajava*
Jackfruit	*Artocarpus heterophyllus*
Mango	*Magnifera indica*
Litchi	*Litchi chinensis*
Ornamental plants	**Scientific Name**
Aloevera	*Aloe vera*
Bamboo	*Bambusa vulgaris*
Chinese Palm	*Livistona chinensis*
Foxtail Palm	*Wodyetia bifurcata*
Bunny pear cactus	*Opeuntia microdays*
Dhupi	*Juniperus indica*
Snake plant	*Dracaena trifasciata*

Flowers species	Scientific Name
Rose	*Rosa acicularis*
Marigold	*Tagetes patula*
Hibiscus	*Hibiscus rosa-sinensis*
Jasmine	*Jasminium sambac*
Kalki phool	*Callestomen viminalis*
Wild Geranium	*Geranium maculatum*
Sunflower	*Helianthus annuss*