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Public Open Space Assessment and Management: A case of Damak Municipality, Jhapa, Nepal

Archana Maharjan[1], Sunil Kumar Yadav[2]
[1]*Graduate Student, Department of Urban Planning, Pulchowk Campus, Lalitpur, Nepal*
[2]*Under Graduate Department of Civil Engineering, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Avadi, Chennai, Tamil Nadu, India*

Abstract: ***Most of the public spaces are being used for the development of public buildings in the name of schools, hospitals, multi-purpose halls, temples, community buildings, etc. The lack of lively and quality public places is faced by all in recent years. There are several reasons why our city continues to encroach on public spaces. The public, even the city leaders are not well aware of the concept and importance of public space. A lack of capacity for development activities and a lack of competent human resources still exist in the establishment and management of public space. Political will and interest play vital roles in achieving lively and vibrant public spaces. The total area or percentage composition of public open spaces to the total area of the municipality illustrates how much people-friendly environment the municipality has been able to provide to its citizens. The aim of the research (which is based on the field survey of 2019 A.D.) is to identify the public open spaces in Damak municipality, assess their use and potentiality; and formulate policies regarding the management of these spaces. A combined strategies technique was considered for the facts series, which includes a self-administered questionnaire survey and observations. The research has identified 167 public spaces in this municipality and it concludes that the formulation of guidelines and laws, with their proper implementation, is a must to secure safe public spaces.***
Keywords: Open spaces, Encroachment, Management, Guidelines, Politics

I. INTRODUCTION

Public space is defined as a place owned by local people for the use of the public. While using this place, everyone should be able to access it, irrespective of age, gender, caste, ethnicity, etc. It should be safe all day and night. Public space is considered a place where people can carry out their daily social, cultural, economic, and political activities and functions without paying, apart from its management. A public space is an area that is typically accessible and open to the public. It consists of streets (including paved ones), town squares, parks, riverbanks, temple sites, etc. Public libraries, schools, hospitals, and ward offices are examples of government structures that are open to the general public; nevertheless, these facilities frequently have more restricted areas and usage restrictions. The public open spaces in Damak city can be seen as public and semi-public open spaces which can be categorized based on ownership, accessibility, and usability.

A public open space is a shared place that is not gated off or sealed off and allows for access by anyone. It is a communal area used by strangers for recreation, socializing, politics, religion, business, and sports. Its protagonist reflects the realities of civic engagement, public dialogue, and public life. (Woolley 2006). Depending on its size, location, accessibility, landscape design, and amenities, open space can provide a variety of purposes. Also, it can support the growth of commerce and tourism, which will aid in the process of urban renewal.

The quality of public open spaces is judged by their usage by people of different ages, orientations, and social strata. Therefore, the promotion of the essential elements for creating social life in public spaces has become a much-needed approach. To the research data, Damak municipality does not have any record of those public spaces neither it has a clear vision of their use for the wider benefit of the communities, environment, and economy. In this context, the consolidation of municipal public open spaces through proper documentation and formulation of policies for conserving and developing such spaces is of prime importance.

Management of public spaces is of the prime concern of the municipality but lacks the strategic vision and master plan for regulating public spaces. Regardless of the distress management, a dilemma of having common property syndrome i.e. “Everybody's property is nobody’s property” is another important challenge to address with collaborative efforts through partnerships and joint initiatives. It is important to preserve and protect the public space sustainably considering aesthetic values, and the management and operationalization in a sustainable and eco-friendly manner for urban life with greater economic prospects.

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II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

A. Open Space/Public Open Space

The standard dictionary definition of open spaces makes it as all land and water under the sky not covered by buildings (any standard dictionary). Tankel (1966), on the other hand, offers a more precise definition of open spaces as any land and water within and surrounding an urban area that is not covered by structures yet has space and light above it. Tunnard-Pushkarev (1981) has identified four functions of open spaces, namely, productive, protective, ornamental, and recreational.

Public spaces include any area that is owned or used by the government, open to anybody for free, and enjoyed without regard to personal gain. These spaces must be inclusive, consumer-friendly, appealing, and environmentally friendly, as well as socially, economically, and environmentally viable. Although public ownership frequently ensures more consistent access and pleasure over time, both publicly and privately owned public areas are taken into consideration.

We could comprehend two kinds of public open spaces. The first type is the open space in which people are aware, such as the spaces that can be used, viewed, and felt. The second type of open space which people are unaware of, such as urban works-protects the water supply, prevents floods, does environmental work, and shapes urban development patterns.

B. Management of Public Open Spaces

Randrup and Persson (2009) present that the sustainable management of POS is actually based on the policy and regulatory framework set by the national, provincial, and local levels. POS management also includes long-term and strategic plans including planning, design and construction, and maintenance. POS management relates to other larger organizations apart from the government level such as culture, health, education, children, youths, elderly care, lifestyles, etc. POS management policies are generally developed by the decision makers wherein the public interests and societal values must be considered.

Institutional and organizational capacity development of the local government, community-based organizations, and other related stakeholders on public space management is one of the key approaches for the management of public spaces. Besides, it also requires the development of critical masses for managing public spaces so that the public sector, community-based organizations, and related stakeholders will be aware, capacitated, and develop longer-term visions and strategies.

The public-private partnership model for public space development, management, and operation is another way of managing public open spaces. The involvement of civic society organizations will also ensure the sustainability of public spaces. This will ensure the participation of the beneficiaries in developing public spaces and also ensure that the benefits of those spaces go to the population. Public spaces intercross all sectors of development and have relations with different departments including forest, construction, agriculture, revenue, wildlife, urban governance, etc. Therefore, it needs a collaborative approach while the governance of public spaces linking all these sectors. There is a need for linkages between three levels of government, and a neighbourhood approach in partnership with the private sector and civil society organizations for conserving and managing public open spaces.

III. METHODOLOGY

A. Study Area

Located in Nepal's Province No. 1, Damak is one of the municipalities in the Jhapa District. With a population of 74,802 as of the 2011 Census, it is the biggest city in the Jhapa District. It covers a total area of 70.85 sq. km and lies at 170m height from sea level. The geographical location of Damak is latitude: 26.6717°, longitude: 87.668°. It begins at the convergence of the Ratuwa River and the Mawa River in the north and finishes at the Siwalik Hills in the south. Mahendra Highway almost cuts this municipality in half. The municipality is in the transitional phase of development with greater economic opportunities. This has created a greater population with scattered living conditions and inadequate needs for public spaces.

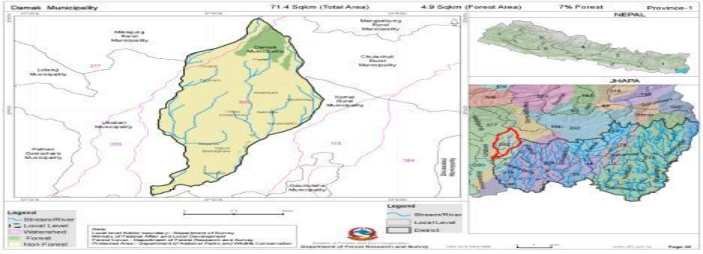


Fig. 1 Map of Damak municipality

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Damak is the prominent business hub of Province-1 and is strategically located to link upstream (hill) and downstream (terai) businesses. Public open spaces in Damak have been shrinking because of unplanned urbanization and encroachment. Most of the available open spaces were used for the market centers, hatt bazar, bus parks, public squares, etc. These open places are used by unsolicited groups of people with no proper planning. There are hardly any open spaces, where the municipal population goes and spends time for recreational purposes.

With recent changing structures of Nepal devolving power and authority to local government under the federal governance system, and the enactment of various acts and policy directives such as the Local Government Operations Act (LGOA), Basic Guidelines for Settlement Development, Urban Planning and Building Construction (2015), National Land Use Policy (2015), it has become imperative for the local governments, such as Damak Municipality to prioritize to manage the public open spaces within the municipality for the well-being of its citizens.

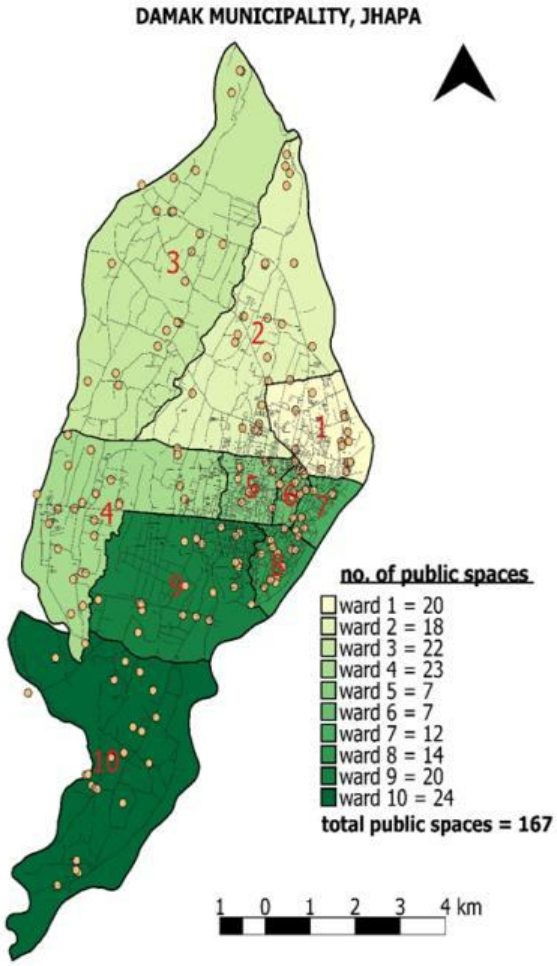


Fig. 2 Public open spaces in Damak municipality

B. Study Methodology

Figure 3 below shows a flowchart of the study methodology adopted. Literature reviews on public open spaces were done beforehand. Studies based on benefits and impacts of public open spaces on community people were also carried out. Identification of issues related to public open spaces in context of Nepal and especially Damak municipality were also studied. Analysis parameters of public open spaces were identified. The analysis parameters included availability of public open spaces, areawise analysis, ownership analysis, use pattern analysis, possible intervention analysis, accessibility analysis, development trend analysis, encroachment analysis and effect of natural hazard analysis. The study area is selected on the basis of rapidly growing city without any proper planning on public open spaces and their management. In early stages of the research, organization of public awareness campaign for public spaces and organization of capacity building workshops on institutional and operational management were conducted.

Only then after the data were collected through survey and assessment on the basis of the analysis parameters. Statistical analysis of identified public open spaces was presented in the tabular forms. Finally, the development of public open spaces management guidelines were proposed to conserve and preserve the identified public open spaces.

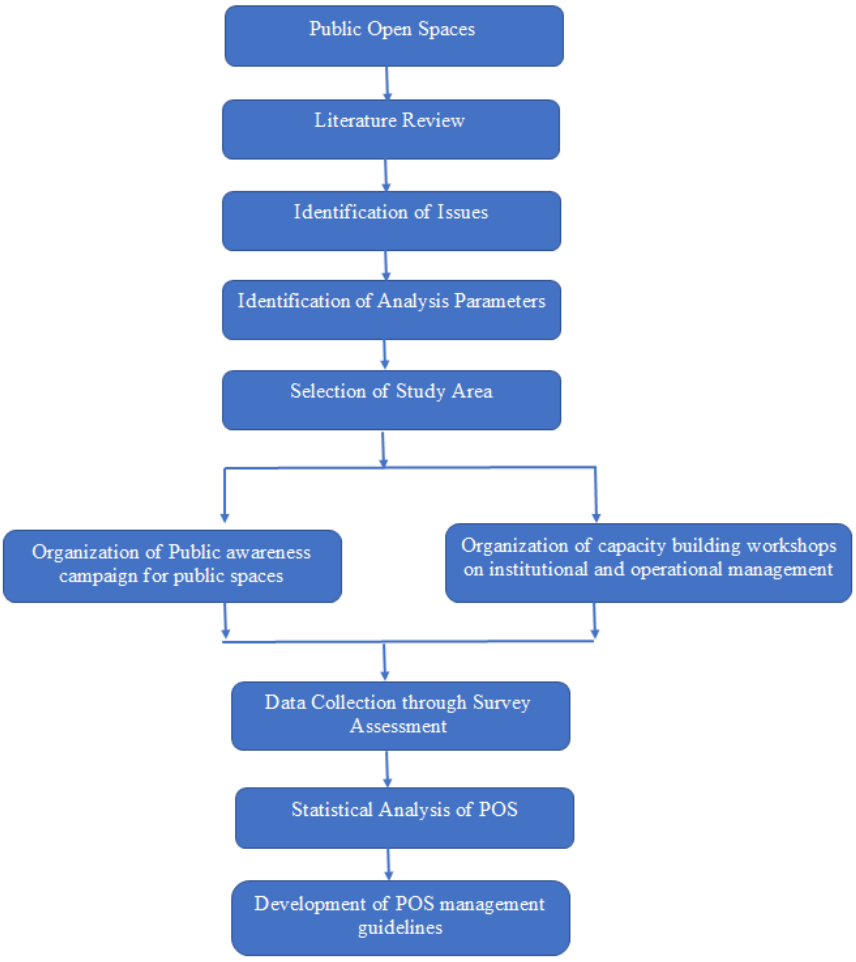


Fig. 3 Flowchart of the methodology adopted



Fig. 4 Capacity building workshop

C. Data Collection

The data for this research is collected by going to every site and getting information with the help of ward chairs and members, these data served as the primary source of the data. The ward chairs and members were asked questions related to the public space and answers were collected using the tool, called Kobocollect. The geo-location was tracked and photos of public spaces are collected, using the same tool.

Before conducting the survey, there was an orientation meeting held at the Damak Municipality, where the project description, objectives, and activities were briefly presented in presence of all ward chairs, members including the mayor, deputy mayor and chief administrative officer, and administrative members. Thus, they were made aware of the research.

The data collected were updated and verified through the capacity building and awareness workshop. The verification specially focused on the name of the space, its use, and its area. The ownership and encroachment issues were clarified and verified. The typology of open spaces was discussed.

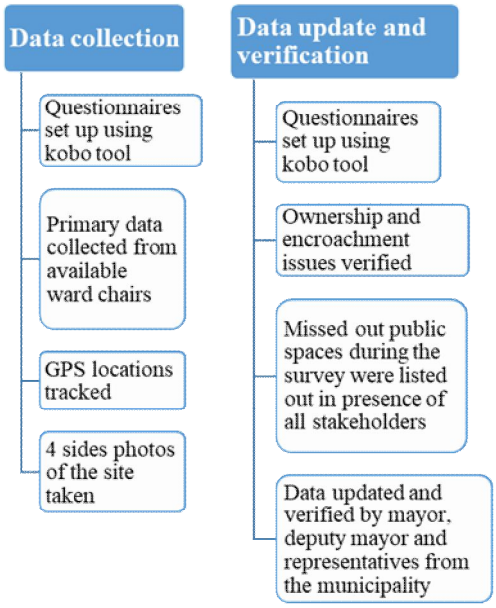


Fig. 5 Data Collection Method

For the formulation of a policy framework for the optimum utilization and management of public open spaces for the well-being of municipal citizens, a series of meetings were conducted with Damak municipality officials and local stakeholders. Municipal-level workshops and design charrette sessions were organized for the dissemination of knowledge regarding the definition and typologies of public open spaces within the municipality, their usage, and the perception of the municipal population towards the desired usage of certain public open spaces within the municipality.

IV. ANALYSIS OF PUBLIC OPEN SPACES

Public spaces include streets, footpaths, rivers, riversides, market centers, playgrounds, temple areas, public schools, open green areas, wetlands, gardens, bus parks, public squares, etc. Different types of public spaces have different values like economic values, health, and environmental benefits, social importance, etc.

Public spaces can be categorized on a different basis:

1) Ownership
2) Functions
3) Area-wise hierarchy
4) Land cover, etc.

In the context of Damak Municipality, we found four types of public spaces based on ownership as

a) Federal government ownership
b) Provincial government ownership
c) Local government ownership
d) Community ownership

Our country, Nepal has 3 layers of the governing system: Federal, Provincial, and Local governments. The public spaces under the federal government cannot be intervened by the local government without its permission. These spaces are meant to be developed only by the federal government. Similarly, some of the spaces come under the provincial government. Here under this research, those public spaces which come under local government ownership and community ownership were intervened and assessed.

According to their functional use, we have categorized these spaces as

- Spaces with public structures and facilities like wards, municipal buildings, schools, hospitals, children and elderly care homes, bus parks, etc.
- Open public spaces like barren land where we can carry out necessary intervention
- Recreational areas like playgrounds, gardens, etc.
- Cultural spaces like temples and churches
- Riverside areas, etc.

The area of public spaces is important to assess such that we can visualize the development elements to be incorporated while planning and designing. In this research, public spaces with an area of less than 1 kattha are not included. However, we found 2 such public areas in all 10 wards having less than 1 kattha area, serving as public spaces. From the view of area-wise hierarchy, it is classified as:

- Area equal to and greater than 1 kattha and less than 1 bigha (Area equal to and greater than 338.63 sq.m. and less than 6772.63 sq.m.)
- Area equal to and greater than 1 bigha (Area equal to and greater than 6772.63 sq.m.)



Fig. 6 Naya sabji bazaar (market area)



Fig. 7 Nawadurga mandir (temple area)

A. Availability of Public Space Analysis

If we look at ward-wise public spaces, there is the existence of public spaces in each ward. Wards 5, 6 and 7 are comparatively smaller in size, and thus, there are fewer public spaces compared to other wards.

The table below compares the area of public spaces with ward-wise areas. It also highlights that the total area of Damak Municipality is 75.85 sq. km whereas the total area of available public spaces is only 1.86 sq. km, which is only about 2.5%. This figure shows that the preservation and maintenance of public spaces are of high importance.

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TABLE I
THE TOTAL AREA OF THE WARD VS THE TOTAL AREA OF PUBLIC SPACES

Ward No.	The total area of the ward (in bigha)	The total area of Public Spaces (in bigha-kattha-dhur) without road/river/restricted forest
1	568 =3.85 sq.km	18-5-5
2	1840 = 12.46 sq.km	56-4-10
3	2847 = 19.28 sq.km	49-7-7
4	1448 = 9.81 sq.km	25-13-0
5	301 = 2.04 sq.km	4-0-10
6	92 = 0.62 sq.km	3-14-4
7	157 = 1.06 sq.km	18-9-13
8	253 = 1.71 sq.km	39-7-16
9	1412 = 9.56 sq.km	24-10-10
10	2282 = 15.46 sq.km	34-11-12
Total	11,200 = 75.85 sq.km	274-4-7 (274.25 bigha = 1.86 sq.km)

B. Areawise Analysis

Mostly, public space is used by many people at a time. From that perspective, the public space should be open and large and must include many facilities within that area to be convenient as well. Bigha-kattha-dhur is the Nepali system of land measurements in some places of the country. 20 dhur is equal to 1 kattha and 20 kattha is equal to 1 bigha. 1 kattha is equal to 338.63 sq.m. and 1 bigha is equal to 6772.63 sq.m.

If we think to develop a park or a playground in the developed ward of the municipality, then 1 kattha land is difficult to find. However, 1 kattha land is not of use for the development of parks or playgrounds. It requires bighas of land. From that aspect, the research has invented only the public spaces which have an area equal to and greater than 1 kattha.



Fig. 8 Chulachuli football ground

TABLE IIIII
NO. OF PUBLIC SPACES ACCORDING TO AREA

Ward No.	No. of Public Space with area equal to and greater than 1 kattha and less than 1 bigha	No. of Public Space with area equal to and greater than1 bigha	Total no. of Public Spaces
1	12	8	20
2	9	9	18
3	9	13	22
4	14	9	23
5	5	2	7
6	5	2	7
7	8	4	12

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8	9	5	14
9	12	8	20
10	18	6	24
Total	101	66	167

C. Ownership Analysis

The ownership aspect is a critical aspect everywhere in the world. In this research, only public spaces under the ownership of local government and community are assessed. From the research, 69 out of 167 public spaces come under government ownership and 98 public spaces are owned at the community level. Most of the cultural places are owned by the community. Similarly, some of the forests and public schools are also owned by the community. The riverside areas, wetlands, and other public facilities come under the ownership of the government. It can be seen that each ward has public spaces under government ownership and community-level ownership. The participation, involvement, and willpower of community people decide whether these spaces are taken as beautiful assets of the city.

TABLE IVVVI
NO. OF PUBLIC SPACES ACCORDING TO OWNERSHIP

Ward No.	Government	Community	Total
1	4	16	20
2	9	9	18
3	13	9	22
4	6	17	23
5	0	7	7
6	4	3	7
7	10	2	12
8	5	9	14
9	7	13	20
10	10	14	24
Total	68	99	167

D. Use Pattern Analysis

The research explores that many cultural places are being used as public spaces. 47 out of 167 public spaces are temples and churches. In such cultural places, it is found that some places have community building and party halls as multipurpose functions. Public schools also act as public spaces. 28 out of 167 public spaces are being used as public schools, providing education facilities to children and students. 5 of the public spaces are provided by forest users' groups for the betterment of the community. 21 out of 167 public places are left barren and are in the stage of fulfilling different requirements of each ward. Only 7 spaces are used as playgrounds in the whole of Damak city. 12 of the spaces are along riversides. From the research, it is found that all these riverside areas are to be developed into pedestrian and cycle-friendly lanes in near future. Disaster management buildings are also to be built near these areas in near future.



Fig. 9 Namuna marg (paved pathway)



Fig. 10 Ratuwa river corridor



Fig. 11 Dhukurpani secondary school

TABLE VIIV
USE PATTERN OF PUBLIC SPACES

Ward No.	Public infrastructure/ facility	Temples/ Churches	Forest	Barren Land	Play ground	Riverside/ Wetland/Pond	Completely Encroached land	Total
1	8	4	2	5	0	1	0	20
2	5	6	1	3	1	2	0	18
3	9	5	1	2	3	2	0	22
4	9	11	0	3	0	0	0	23
5	3	4	0	0	0	0	0	7
6	4	2	0	0	0	0	1	7
7	3	0	0	4	1	2	2	12
8	8	4	0	0	0	2	0	14
9	13	6	1	0	0	0	0	20
10	10	5	0	4	2	3	0	24
Total	72	47	5	21	7	12	3	167

E. Possible Intervention Analysis

The data were classified as the public spaces which are in use in the current situation and the spaces where further intervention is possible, wherein the land is still virgin. According to the data collection, 79 out of 167 public spaces are open, and possible interventions guided by the policy, as well as development, are possible. Thus, 88 public spaces are already providing public facilities from different aspects.

TABLE V
TOTAL NO. OF PUBLIC SPACES VS NO. OF PUBLIC SPACES IN WHICH INTERVENTION IS POSSIBLE

Ward No.	No. of Public Space	No. of Intervention/Development Possible	Total Area of Public Space	Area of Intervention/Development Possible
1	20	11	18-5-5	15-6-0
2	18	10	56-9-10	53-18-10
3	22	13	49-7-7	39-9-15
4	23	8	25-13-0	8-1-2
5	7	5	1-17-10	1-10-10

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6	7	0	3-14-4	0
7	12	10	30-9-13	29-11-8
8	14	2	39-7-16	30-0-0
9	20	9	24-10-10	13-18-0
10	24	11	34-11-12	29-5-10
Total	167	79	284-6-7	221-0-15

F. Accessibility Analysis

Out of 167 public spaces identified, 7 spaces do not have road accessibility, but there is the possibility of road access in near future. In the spaces which have road accessibility, the road width is either 30 feet or 50 feet. Out of 160 public spaces which have road access, 51 roads are in black topped conditions. Most of the roads have gravel roads that are 96 public spaces have gravel road access. As Damak is at a fast pace of development, all these gravel roads will soon be developed into blacktopped. Some of the places are agricultural land and have earthen and grass roads. 3 out of 160 roads have tiles as their accessibility context.

G. Development Trend Analysis

To have an idea of the surrounding buildings and their settlement types, the research also included the types and number of different buildings on their use basis. 84 out of 167 public spaces have only residential buildings around their periphery of 100m. 40 public spaces were surrounded by residential and mixed-used buildings at the periphery of 100m and 43 public spaces were in a commercial zone surrounded by buildings like residential, mixed-use, commercial, institutional, etc.

H. Encroachment Analysis

As discussed with all ward chairs and municipal members, there is a significant number of public spaces which are in the encroached state. But from mutual coordination, only those lands which are possible to reclaim, are surveyed. According to this, 3 public spaces are completely encroached on by squatters. Encroached land does not mean that there is no open space left in these lands. 8 out of 167 have partially encroached. 156 public spaces are free from any kind of encroachment.



Fig. 12 Encroached public land

I. Effect of natural hazard analysis

The map of Damak is north-south elongated and the biggest rivers are flowing, one in the east and the other in the west direction. Wards 5 and 6 are not intact to the rivers as these wards lie in between other wards. Otherwise, all other ward boundaries connect to the rivers. Therefore, the public spaces near the rivers are prone to flood hazards. From the research, it is found that 43 out of 167 spaces are near rivers and are prone to flooding almost every year. In such areas, there are some embankment works carried out. However, it is not possible to completely embanked the riversides as it is surrounded by the river on their east and west sides. 122 public spaces are out of flood danger.

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Fig. 13 Riverside public space

V. REGULATORY FRAMEWORK FOR MANAGEMENT OF PUBLIC OPEN SPACES

For the formulation of a policy framework for the optimum utilization and management of public open spaces for the well-being of municipal citizens, a series of meetings were conducted with Damak municipality officials and local stakeholders. Municipal-level workshops and design charrette sessions were organized for the dissemination of knowledge regarding the definition and typologies of public open spaces within the municipality, their usage and the perception of the municipal population towards the desired usage of certain public open spaces within the municipality.

Based on the discussions with the municipality for the preparation of a regulatory framework for the management of public open spaces within the municipality, and with the local stakeholders during various ward and municipal level meetings, the following policies are formulated:

1) Damak shall be developed as a sustainable city from the perspective of managed public spaces.
2) Municipal Public Open Space Inventory shall be prepared and updated regularly.
3) Public Open Spaces shall be categorized according to the area, use, and ownership.
4) A municipal-level land use plan that is compatible with efforts to develop the local physical infrastructure shall be developed and put into action.
5) By discouraging the inappropriate use of public open spaces, the best possible use and protection of Public Open Spaces shall be ensured.
6) Public awareness shall be enhanced on protection and optimum utilization of the public open spaces and long-term impact hereto.

VI. CONCLUSIONS

There have been several public open spaces in Damak municipality. These open spaces have neither been properly mapped out nor properly used for social and public consumption. The management of public spaces is now the prime concern of the municipality and is working on a strategic vision and master plan for regulating public spaces. The municipality has realized the importance to preserve and protect the public space sustainably considering aesthetic values, and the management and operationalization in a sustainable and eco-friendly manner. Hence, the identified 167 public spaces should be protected. Further encroachment activities should be completely controlled by the local government. If there are still some public spaces to be identified, it should be done further from each ward level. The detailed area demarcation should be carried out in coordination with Land Survey Department and proper boundaries should be constructed either with tree plantation or fencing facilities. Any further developments of public spaces should consider economic, social, safety, and environmental aspects. Each public space should promote the need for inclusive, safe, quality, and accessible perspectives. Every public space development should ensure the participation of citizens in all aspects from planning, design, resourcing, maintenance, and enjoyment. The policies of the regulatory framework should be strictly followed to manage public spaces. If we fail to conserve and preserve public open spaces, cities will soon be converted into chaotic, haphazard, and unplanned settlements. Therefore, we should promote the essential elements for creating social life in public spaces.

VII. ACKNOWLEDGMENT

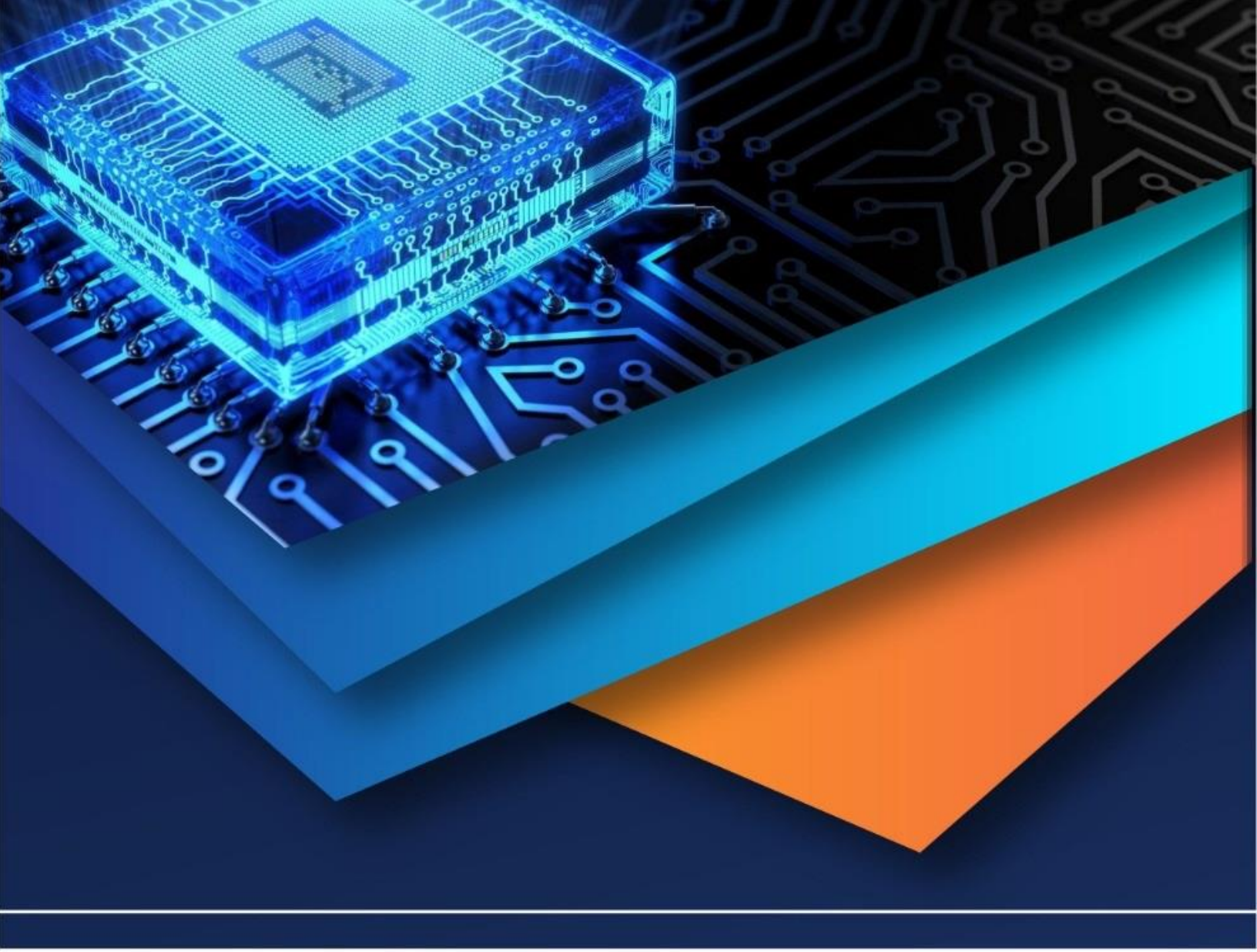
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