

A STUDY ON THE PROBLEM ASSOCIATED WITH THE BUILD BACK BETTER (BBB) APPROACH ON PUBLIC SPACES FOR DISASTER RISK REDUCTION IN KATHMANDU VALLEY, NEPAL

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ABSTRACT

The study entitled "A Study on the problem associated with the Build Back Better Approach (BBB) for Public Space in Disaster Risk Management in Kathmandu Valley, Nepal" aims to determine whether DRR is effectively applicable in open space management and practicable in the context of Kathmandu Valley. It assesses the problems of public space, reason behind shrink & encroachment as well as management aspects. The three locations from Kathmandu Metropolitan City, Lalitpur Metropolitan City and Bhaktapur Municipality were selected for the study. The participatory approach and methods such as structure questionnaire survey, in-depth interview (IDI), focus group discussion are the tools used to collect the primary data. The current condition of public space is improving as compared to the previous one. Almost all the public space is either protected by boundary wall or fencing. This is because the illegal encroachment, legal hassle and public awareness have compelled the authority to include public space in their annual planning and budgeting. Though infrastructure like toilets, pavements etc. have not been maintained as per the standard. In disaster management aspect, there are limited infrastructure and requirements in public space. The plan to manage the public space in case of disaster has found unknown to the concerned authority.

Keywords: *Disaster risk management, public space, community participation, private sector engagement*

1. INTRODUCTION

A Public space is any area in which any kind of structures such as buildings are not developed and accessible to public. In urban context, the open spaces include parks, schools, streets, public seating areas etc. Public open spaces enhance the sustainability of city. It also increases the quality of life, aesthetic value, environmental health, economic growth and disaster resilience. These open spaces have multi-functionality, i.e. recreational, economical and managerial. Besides, from its socio-cultural benefits, it can be used for economic benefits of municipalities and citizen. In past few years open spaces had played a vital role in disaster management. Open space has served as a primary place to rescue, provide shelters, campsites and to provide other lifesaving supports and assistance.

The sustainable development goal 11, i.e. Make cities inclusive, safe, resilient and sustainable target has identified creating a green public space as the tool of tackling poverty, especially of urban slums in urban context (SDG 11). It also promotes average share of public open space for public use by all sex, age and person with disabilities [1]. [2] urges, a major initiative is needed to make city resilient and achieved through the increased collaboration among stakeholders and urban systems research. It also emphasizes on national resilient

cities initiative for natural hazard mitigation, likewise, [3] highlighted that the open spaces provided a need of residents and will enhance the pleasant needs of the community. The quality of open spaces is determining by functional factors, semantic factors, environmental factors, social factors and forms factors. There is actual need of expanding the actual standard of open space in relation to residential complex.

2. MATERIALS AND METHODS

This is non-experimental/exploratory research in which the findings have been based on the primary research. It follows a participatory approach, whereby a local case study of open space development in Kathmandu Metropolitan has used to illustrate current open space policies, plans and priorities for the municipality. This chapter provides an overview of the study approach, methods. The fieldwork that was undertaken, the interview process was followed the selection of data that has been analyzed based on the primary source of information.

2.1 Research Design

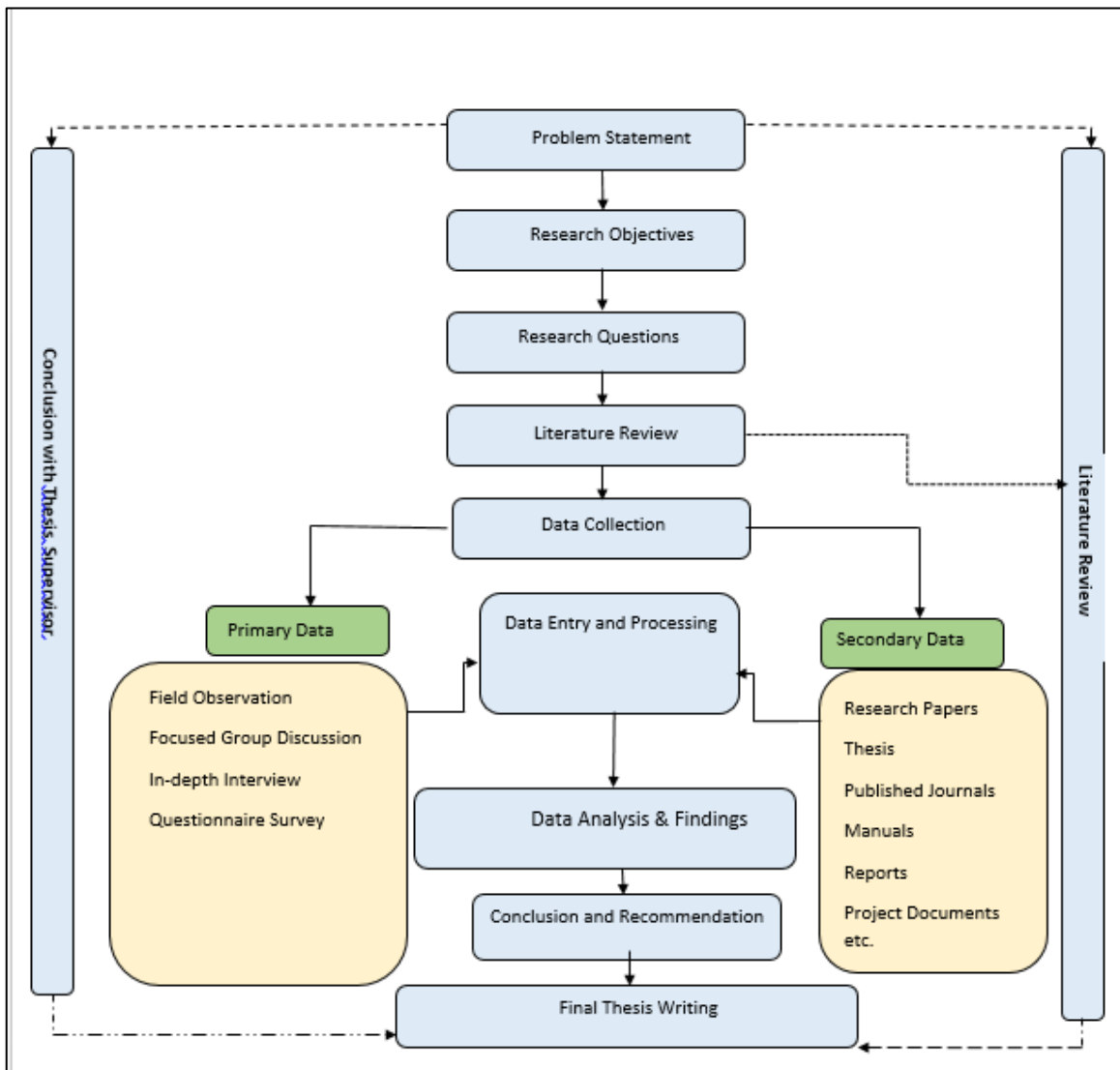


Fig: 2.1 Research Framework

This study has mainly consisted of theoretical analysis and cases study. The core logic here is to identify the role

of public space in disaster risk reduction. The research has started with theoretical study in public space in urban area. From the existing DRR theory, especially urban DRR to [4] conclude the whole view of DRR and its different dimensions. While the scope of public space is conducted by cases study. By reviewing urban public space in a practical way, this study is to make them reflect to the dimensions extracted from the urban DRR. With the research paths, one will be from DRR prospect and another will be from public space prospect. They will be match at common point for sustainability and urban resilience. Research design as a structure of research that holds all of the elements in research project together, in short it is a plan of all proposed research work. It is necessary to make possible the smooth sailing of the various research procedures, yielding maximum information with information effort, time and money. The designs, which consist of minimum biasness, smallest experimental error and maximum information, are considered good research design. There are four types of research design: exploratory, descriptive, explanatory and experimental [5]. It is a study of new phenomenon. Exploratory research is characterized by its flexibility. When a problem is broad and not specifically defined, the researchers use exploratory research as a beginning step. Exploratory studies are a valuable means of understanding what is happening; to seek new insights; to ask questions and to assess phenomenon in a new light [6]. Exploratory research has the goal of formulating problems more precisely, clarifying concepts, gathering explanations, gaining insight, eliminating impractical ideas and forming hypotheses. Literature research, survey, focus group and case studies are usually used to carry out exploratory research. An exploratory research may develop hypotheses, but it does not seek to test them [7]. This research is exploratory research because it has attempted to find out the in depth understanding of public space for disaster risk management in Kathmandu Valley and importantly not much research has been done. The goal of this a research is to explore the problem and around it and not actually derive a conclusion from it. It will enable to set a strong foundation for exploring ideas and finding variables that actually are important for the analysis. Most importantly, it save the time and resources, as it enable us to know if it worth pursuing further research or not.

2.2 Study Area

The field study area was determined based on the scientific approach. For selection of field study, municipalities in Kathmandu Valley were identified based on the government data using sampling technique. After the selection of municipalities based on different criteria and scenario, sampling technique was performed to identify the field study area. The location map of the field study area is as shown in Fig. below.

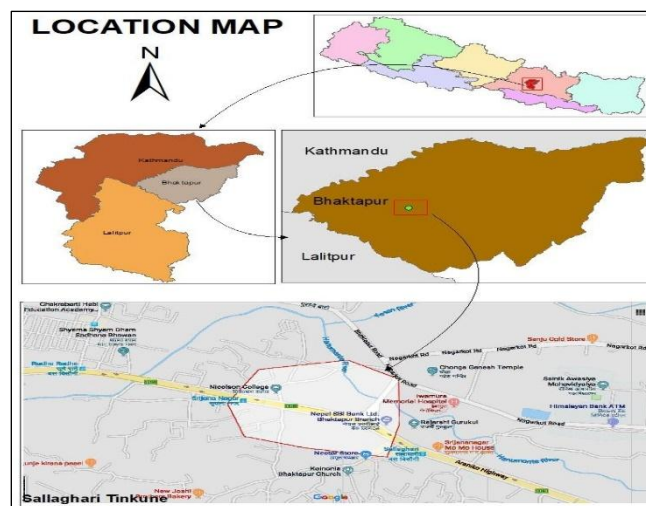


Fig. 3.1. Study Area

The sample size for population is estimated on the basis of [8]. Various factors affecting the sample size has been incorporated in this research. For populations that are large, [9], developed the Equation 1 to yield a representative sample for proportions. Which is valid where n_0 is the sample size, Z is the abscissa of the normal curve that cuts off an area α at the tails ($1 - \alpha$ equals the desired confidence level, e.g., 95%), e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is $1-p$. The value for Z is found in statistical tables, which contain the area under the normal curve.

Sample size for infinite population

$$n_0 = \frac{Z^2 qp}{e^2} \quad \text{Equation (1)}$$

After calculation of sample size of infinite population, the sample size is adjusted to finite population i.e. denoted by using the formula in equation 2.

Sample size for finite population

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} \quad \text{Equation (2)}$$

The three field study area identified for this research are namely Ratnapark in ward no 6 of Kathmandu Metropolitan City, disaster management park in ward no 5 of Lalitpur Metropolitan City and Sallaghari is in ward no 1 of Bhaktapur Municipality. Based on the above calculation, sample size for this study was calculated as 113.

2.3 Sampling Procedure

Sampling is a process or technique of choosing a sub-group from a population to participate in the study; it is the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected. The two major sampling procedures in research are probability and non-probability sampling [10].

Simple random, probability sampling which provides the base from which the other more complex sampling methodologies [11] is used to choose the municipalities for field study with replacement. As we have interest in drawing inferences from the sample to the population with minimum cost and time, purposive sampling, a non-probability sampling was used to arrive at a sample that can answer the research questions [12] is to determine the field study area after determination of municipalities.

[13] explain the sample size determination is often an important step in planning a statistical study and it is among the important hurdles to be surpassed, one must obtain an estimate of one or more error variances and specify an effect size of importance. So the case of this research, [9] is used as follows to steps of determining the sample size for infinite population followed by adjustment to finite population.

Steps A: Determination of Sample Size for Infinite population using the equation 1:

2.3.1 Numeric values:

$Z = 1.96$ for 95% confidence level

$p = 8\%$ (assumed that only 8% of total population use it for DRM)

$q = (1-p) = (1-8\%)$

$e = 5\%$ (assumed margin of error)

2.3.2 Calculation of sample size with numeric values using equation 1. A. $n_0 = 113$

Steps B: Determination of Sample Size for finite population using the equation 2:

2.3.2 Numeric Values

a. N= Population (Regmi, 2014)

i. Population of Kathmandu Valley of 2011 = 671846 [14]

ii. Growth Rate = 6.5% [14]

iii. No of years = 9 (as of 2019)

iv. Equation to calculate: $P = P_0 e^{rt}$

Population P = 1,165,411

Sample Size = 113

3. RESULTS AND DISCUSSION

3.1 Education Level

The educational level of the professionals is presented in the figure(Fig 3.1).

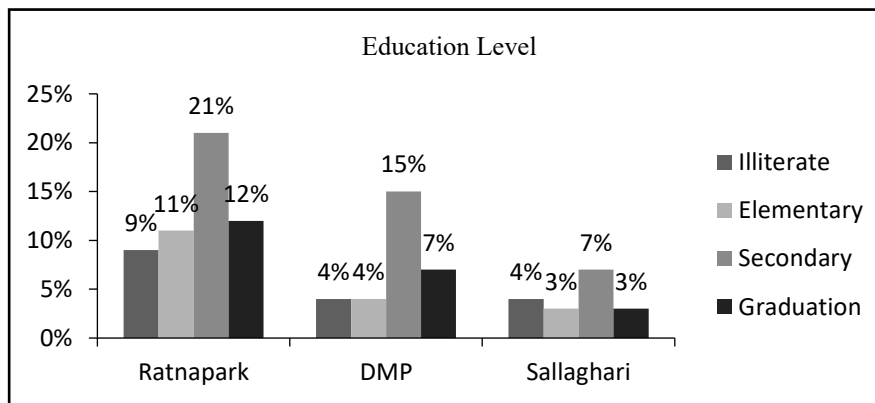


Fig. 3.1. Education Level

3.2 Occupation Status

The occupational status of the respondents are as shown in the figure (Fig 3.2).

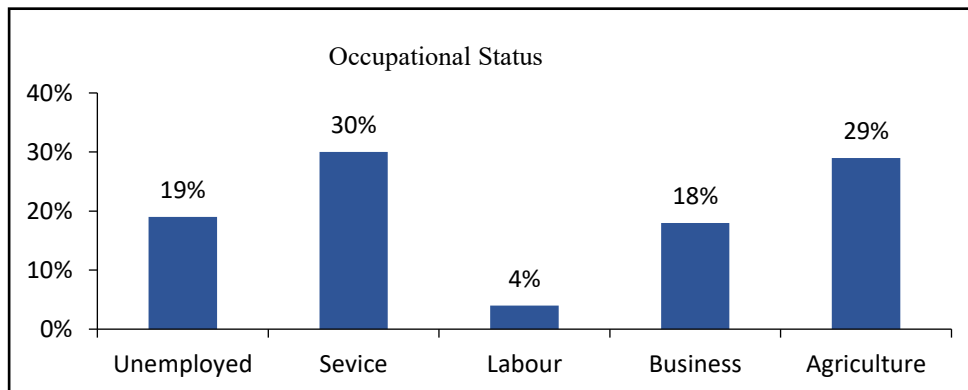


Fig. 3.2. Occupational Status

3.3 Current Status of Public Space

The survey was conducted in order to find out the current status of Public Space i.e. condition, construction, challenges & opportunities etc.

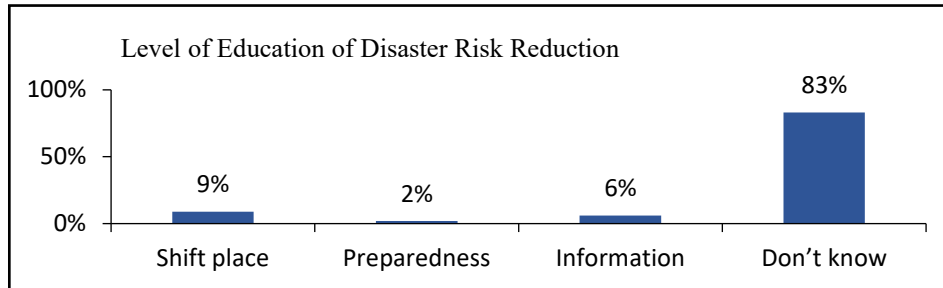


Fig. 3.3. Education Level

3.3.1 Life & Disaster Risk Reduction

The assessment of the awareness gained from the occurrence of the disaster is illustrated as shown in the figure (Fig 3.4).

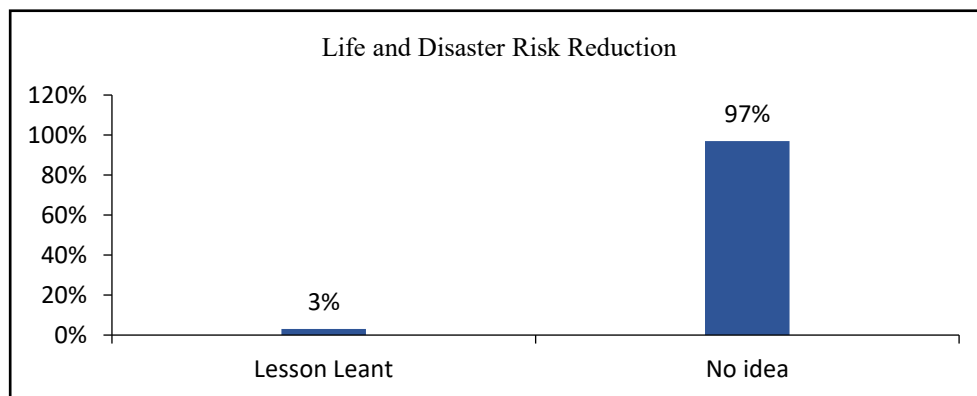


Fig. 3.4. Life and Disaster Risk Reduction

3.3.2 Safe Place during Disaster

The investigation found that the safe place during the disaster is open space. All the respondents unanimously agreed that open space was safest during occurrence of the disaster .

3.3.3 Concept of Open Space

The knowledge about the open space was assessed during the survey. And it was found that majority didn't understand about the concept of the openspace as shown in the figure(Fig 3.5).

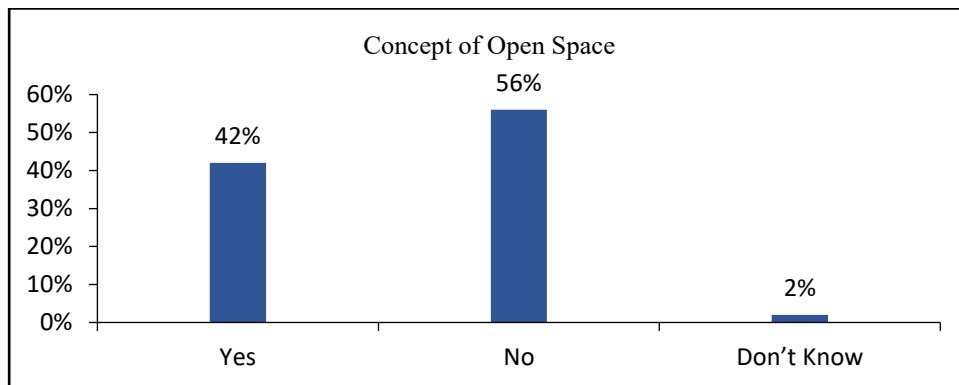


Fig. 3.5. Concept of Open Space

3.3.4 Public Space nearby Home

The status of Public space nearby home was also questioned during the survey and it was found that the public space wasn't available nearby as shown in the figure (Fig3.6)

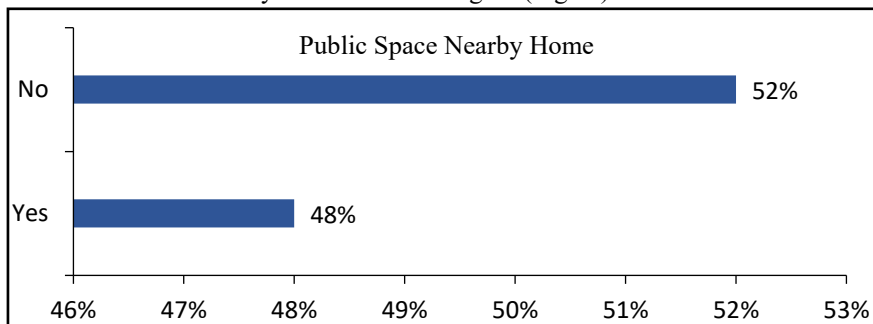


Fig. 3.6. Public Space nearby Home

3.3.5 Need of the Public Space

During the survey it was found that majority of the respondents agreed with the need of public space for the safety as shown in figure (Fig 3.7).

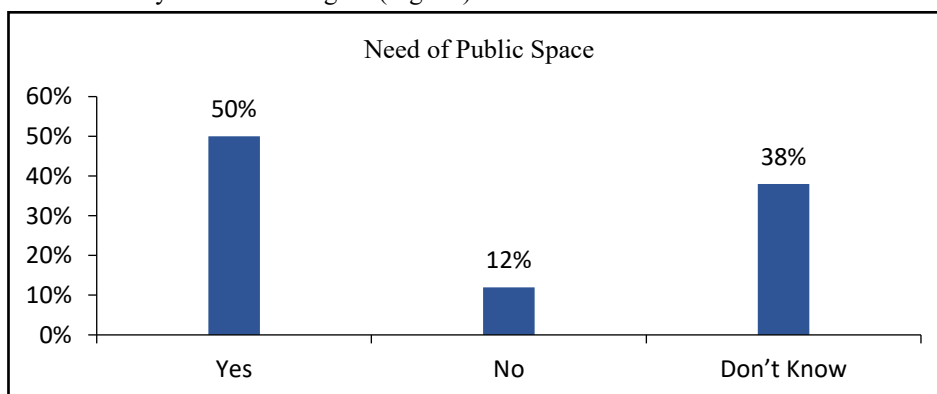


Fig. 3.7. Need of Public Space

3.3.6 Reason to Go to Public Space

The urban life is so hectic and tiring; thus, it is hard to squeeze to the leisure time in between. People are seeking different modes to be relax and joyful regardless of massive problems like unemployment, costly life

style etc. The survey revealed that 27% of respondent go to public space for spending time with friends, 26% to spend leisure time, 11% to get entertain, 34% have no specific reason be there and only 4% don 't go to public space at all as shown in Fig. (3.9) below.

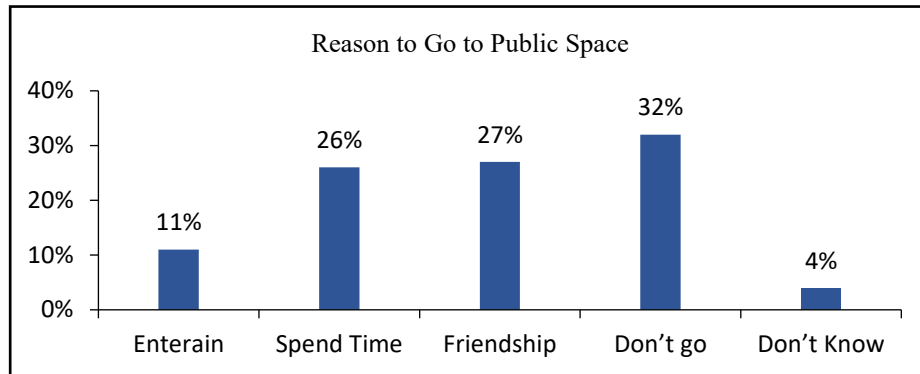


Fig. 3.8. Reason to go to Public Space

3.3.7 Level of Satisfaction among the Respondents

The field study area has chosen that they would represent the public space of Kathmandu Valley. Ratnapark has well managed by KMC, Disaster Management Park at Lalitpur is under makeover with the support of JICA & Sallaghari Tinkune is vacant and unmanaged area. Thus, the satisfaction with Ratnapark is very good, disaster Management Park is happy and Sallaghari Tinkune is unhappy in general. The result shows that 5% of respondent are very happy, 27% are happy, 21% are unhappy and 46% do not know at all as shown in Fig. 3.10 below:

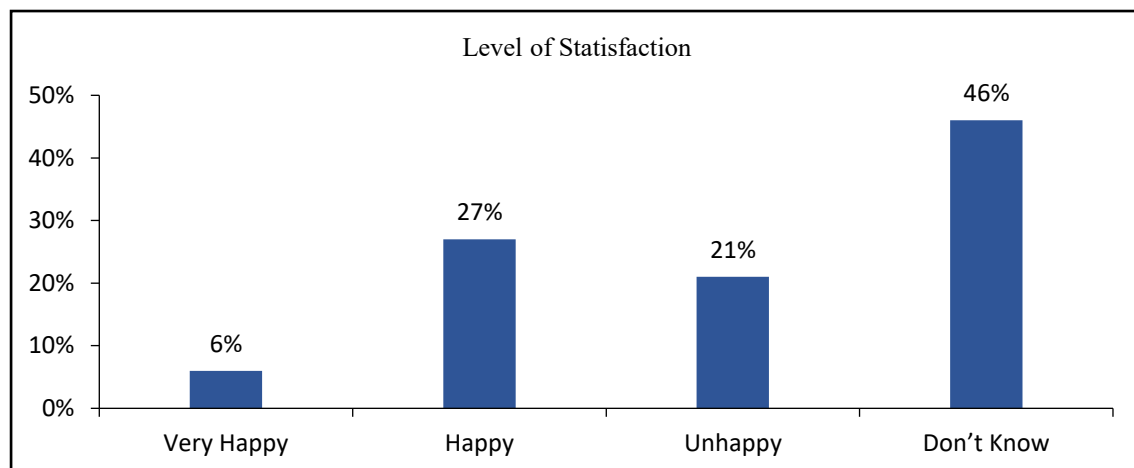


Fig. 3.10. Level of Satisfactions

3.3.8 Condition of Public Space

Although among three-study area, Ratnapark is only the place that is well managed; respondent found that the condition of public space is good. Most of the constructive response was heard in Ratnapark followed by Disaster Management Park and Sallaghari Tinkune respectively. Around 27% of respondent found the condition is very good, 28% good, 24% neutral, 12% bad and last 8% established it very bad as shown in Fig. 3.11 below.

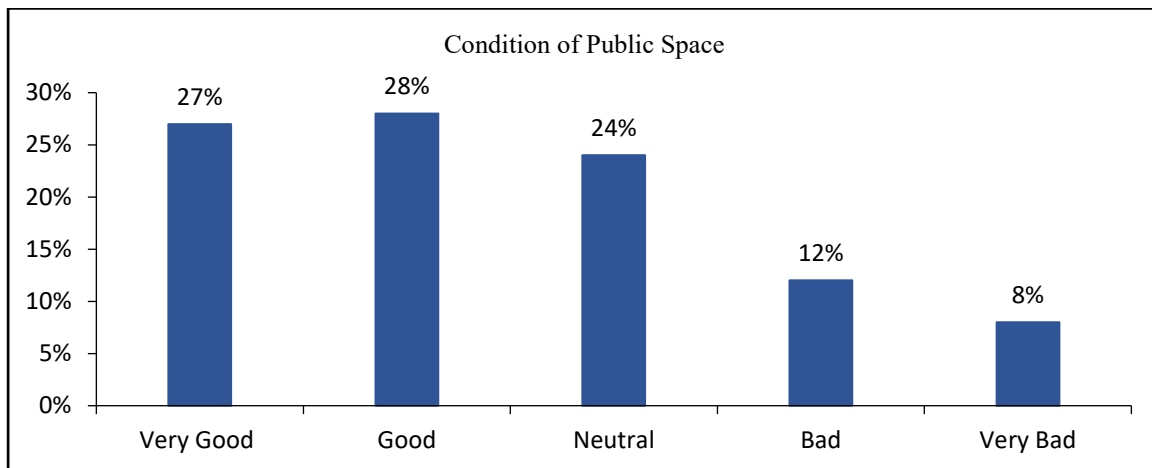


Fig. 3.11. Condition of Public Space

3.4 Discussion

The public space in Kathmandu valley has dominated by male visitors i.e. just more than 3 quarter of the respondents reported as male. The main reason behind the lack of women visitors includes security, confidence level & social restrictions and behaviors. It has also found that the most of the visitors having offspring i.e. more than half, that leads to conclude that the head of household have limited free time for recreation and private activities. Spouse count was less significant due to the busy schedule, openness & lack of willingness. Similarly, the more than half visitors has found young between age of 19- 40, mostly come with friends, which is polarized, as the adult and senior have no presence. This is because the senior citizen could travel longer, as always seek a company & adult are more focused in their personal stuffs. Interesting finding was that the half of the college or high school student was single, after school come to hang out with their beloved one irrespective for their employment history.

Mega Earthquake in 2015 is the last major disaster have faced in which they were in need of food & shelter respectively. This shows an alarming outcome that the person lacks the basic need despite the government & NGO effort in relief materials distribution. This also advised that the government & NGOs should focus on food items after disaster. The discouraging result has found that the no one could have understood risk management. More than three-fourth of people, do not know about it including some assigned authorized personnel. So that all the efforts made by stakeholders to disseminate the information of disaster management should be taken into reconsideration. They are also uncaring about the learning platform of disaster management. Therefore, the teaching approach is also under consideration. The clear concept of DRM is missing to every respondent. This is a disturbing finding that DRM is only linked to relief distribution only as per their understanding. Even the authorities had no clear idea about the DRM concept.

The public space is well understood by less than half, remaining do not understand about the public space & only few do not know about it at all. Although half of respondent considered the public space is needed but only less than half of respondents lives nearby public area whereas remaining more than half do not have public space nearby their home. This suggests that the public open space is quite scare in Kathmandu. The people goes to get entertain, hang out with friends and among them only few of respondent have found very happy, quarter are happy, and unhappy respectively and nearly half don't know. This can be related to the condition public space where a quarter establish very good and neutral and more than quarter institute good, only about 10% established bad and last 8% established it very bad, so most of the respondent spent the time around 1 hour.

Government solely manages the public spaces in Kathmandu valley. There is no involvement of any party in management but only nominal i.e. 3% conclude that government is good at management, 1% thought that the

community is better, almost none do not know who can manage the public space. The entry fee billed at one of the study area, Ratnapark is expensive, fair, cheap & do not know by 34%, 15%, 18% & 46% respondent respectively. Hence, the people have mixed view on the entry fee. The operation and management fee has not paid at any study area. However, nobody reported about Operation & maintenance fee. Similarly, nobody was involved in management process equally, more than three-fourth respondents was not member of management committee & approximately a quarter do not know about management committee. It has concluded that that the neither women nor disabled people have active participation in management of public space as well as there was no special encouragement for them to participate in management.

About the public space only a quarter of the respondent has found orientated, more than half were not oriented & less than half don't know about orientation which means that people are not aware about public space and its attributes. The quality of public space is good and it was establishing in survey where more than half respondents has found satisfied, a quarter has not satisfied, and quarter does not know about it. It has found that the three-fourth space has provided the boundary wall, 4% has live fencing, a quarter is open & 6% remained fenced. The government is quite serious about encroachment & plan to save the public space. The construction is ongoing in two sites and in one site, the construction is already completed. There is lack of regular monitoring of the public space in order to tracking the progress and

problems faced in the public space management system. Nobody could visualize the challenges & opportunities of government, community & private sector in management of public space. Nobody is fully aware about the sustainable public space management including local level government authorities and community people particularly focusing to use of public space during disaster situation. However, public space regarded as important venue for the temporary rehabilitation of disaster survivors during post disaster events. This study is relevant in disaster risk engineering and management point of view to save the life of disaster survivors.

4. CONCLUSIONS

The dominant numbers of visitors in all three sites are male based in gender and offspring established on household position. Most of the visitors come here to spend the time with friend and others come to pass leisure time. The numbers of visitors are high in Ratnapark due to the well-maintained condition and its centered location followed by Disaster Management Park and Sallaghari Tinkune. The age group of visitors varies from child to senior citizen but half count for teenager who normally comes after college or school to hang out. As most of the visitors are between the age group of 19-25, the education level of visitors is predominantly high school and university student and marital status is single. The occupation ranges from employed to unemployed, agriculture top the chart in this group.

Out of three-study area, Ratnapark is in good condition with good quality metal fences for illegal encroachment, black topped access road, nearby hospital for emergency, Ranipokhari in case of fire, government offices and security forces. The surface has covered with green grasses, dedicated pave way for commute and well managed sitting place. It is facilitated with toilet and designated entry and exit points. Disaster Management Park in going massive reconstruction, which in time will turn as disaster management hub with facilities like drinking water, toilet, office for disaster management, well-paved pathway, green surface and mostly importantly facilitated with black topped road and hospital nearby. Sallaghari Tinkune is undermined and lack of budget and vision of government authority has turned into a dumping site. Although the fencing work underway, but the surface filled with debris where the sitting place is literally hard to find. Adjacent to Arniko highway, it could be the livable public space and source of income generation.

The management of all three parks are handled by government, and to some extent in Ratnapark, government has provided the justice to it. Ratnapark has designated officers for management under Kathmandu Metropolitan where regular operation and maintenance as well as meetings, repairs and construction is carried out. With entry fee, Ratnapark is self-sustained in terms of budget to execute any plans. Disaster Management

Park owned by Lalitpur Municipality and has an officer to oversee the undergoing construction and its management afterward in planned to be executed by LMC with support from self-help group. Sallaghari Tinkune is under ward no. 1 of Bhaktapur Municipality and it is deemed by authority due to lack of budget and concerns. They have no concrete management plans until now and excepting the support of international and national NGOs for future development.

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