Design for All

Guest Editor : *Dr.Bijaya K. Shrestha* **, Nepal**

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Other Regular Features

GUEST EDITOR:

Dr.Bijaya K. Shrestha received Doctoral in Urban Engineering from the University of Tokyo, Japan (1995-'98) and Master in Urban Design from the University of Hong Kong, Hong Kong (1993-'95). Having professional experiences for almost three decades he had served to numerous organisations – Government of Nepal, educational institutions, private sector and United Nations Centre for Regional Development (UNCRD): Disaster Management Hyogo Office, Kobe, Japan, besides consulting works for ADB, UNICEF and UN-Habitat. His contribution in establishing Post Graduate Department of Urban Design and Conservation at Khwopa Engineering College in 2007 is noteworthy, where he served as Head of Department for two years. At present, he is engaged in ADB supported projects and research works in different Architectural Schools, besides editing international journals and conference papers. He is the recipient of numerous gold medals and prizes for his excellent academic performance. He was decorated by 'Calcutta Convention National Award 2006' by Indian Society for Technical Education for his best paper at the 35th ISTE Annual convention and National Seminar on Disaster – Prediction, Prevention and Management. He has already contributed more than ten dozen of papers, published in various

forms: book chapter, international journals, conference proceedings, local magazines and journals including in local newspapers.

Editorial:

It is my honour and privilege to be a guest editor once again for 'Design for All: A Publication of Design for All Institute of India,' September 2018 issue. This easily accessible publication is useful for students, researchers, practioners and policy makers and has become a common platform to share research findings, experiences and knowledge.

This September issue mainly covers the research works carried out by undergraduate and post graduate students particularly of Post Graduate Department of Urban Design and Conservation of Khwopa Engineering College, Bhaktapur, Nepal.

The technical education in Nepal especially in Architecture, Urban Design and Planning is a new phenomenon. With assistance of the World Bank, the Swiss government and the Canadian government, the first B. Arch. program was initiated at Pulchowk Campus of Institute of Engineering, Tribhuvan University some three decades back. In 1994, Nepal Engineering College (nec) was established as the first private engineering college offering B. Arch. course. So far, there are more than half a dozen of schools offering architecture course. Few of them also run master courses in urban studies.

Acknowledging the domestic need, global demand and changing nature of the specialisation within architecture, planning and development professions, Khwopa Engineering College (KhEC) under affiliation of Purbanchal University has started a Post Graduate course, Master of Science Degree on 'Urban Design and Conservation' (MSc. - UDC) - a combination of dual degrees into one

master program – the first of this kind in Nepal from February, 2007. It has defined its operation strategy by integrating the threefold activities of doing Research, Publication and Information Dissemination, developing new learning and teaching methods and providing consultancy, counselling and advisory services. It will strengthen partnerships and networking with related agencies, other academic institutions, local governments and community organisations, both at the national and international levels.

This issue includes six different articles associated with public realm. The first article entitled 'Transformation of 'Dharahara - Sundhara' Square in Kathmandu Metropolitan City: Lost Opportunity and Privatisation of Public Space' written by myself elaborates the privatisation of public spaces in ever growing cities and highlights the debate on post-earthquake reconstruction issues. The second paper on 'Planning and Design Principles of Catholic Church: Emerging Church Architecture in Nepal' is developed by Ms. Smriti Shrestha from her B. Arch. final thesis at Acme Engineering College, Kathmandu. She is the first person in Nepal to do B. Arch final thesis on church. She studies the historical development of church architecture, reviews both national and international case studies before coming up with some basic planning and design principles for Catholic Church design in Nepal. The third paper 'Revitalisation of Rajkulo of Bhaktapur' explores the traditional water network system of Bhaktapur that links rural and urban settlements. This paper was developed by Ms. Manju Manandhar from her master thesis on Urban Design and Conservation from Khwopa Engineering College. The fourth paper 'Cultural Heritage of Bajrayogini Chariot Festival of Sankhu' demonstrates the culture values of Bajrayogini festival and

analyses the damages caused by the 25th April 2015 earthquake before proposing some key recommendations. The fifth paper 'Developing Jadibuti as an Urban Node of Three Districts' explores the potential of city peripheral area for planned development as a node linking all three districts. This paper is contributed by Ms. Renu Maharjan, who has been practising as an urban designer in Kathmandu. The last paper is on'Social Sustainability of TemporaryShelters: A Case of Bungamati and Saku,' contributed by Ms. Julisha Pradha, a fresh graduate from Post Graduate Department of Urban Design and Conservation of Khwopa Engineering College. She has highlighted the present sorry condition of earthquake victims living in temporary shelters in Bungamati and Sankhu, both historical settlement.

I would like to thank all the authors for contributing valuable papers. All these paper address the emerging issues of development, planning and architecture in Kathmandu and Kavre valleys.

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26th August 2018 (Sun)

Transformation of 'Dharahara - Sundhara' Square in Kathmandu Metropolitan City: Lost Opportunity and Privatisation of Public Space

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Contextual background and study objectives

Public spaces in the form of squares and residential courtyards including street and pedestrian lanes are the most important urban design elements of 'Malla' towns (thirteenth to eighteenth centuries) in the Kathmandu Valley. Accounting for about 10-12% of built up area (Adhikari, 1998), these community spaces comprising of religious monuments and social amenities are the venue for numerous socio-cultural and religious activities in daily lives as well as in festival seasons. Networking of such public spaces together with harmonious balance between man-made structure and natural ecology, integration of open and built spaces, and architectural composition of buildings and monuments all have proved that those builders were extraordinarily skilful as well as capable of integrating visual and functional principles into the social needs (Hosken, 1974). The 'Rana' autocracy (1846-1951) added a new typology of urban form in the city peripheral areas by building riverfront promenades, greenery parks and construction of huge palace complexes with

extensive landscaping and gardening, covering the whole street blocks.

These public realms, the heritage of the past and part of vernacular architecture are equally significant for rapidly urbanising Kathmandu in providing respite from busy urban life. They complement in building community and creating liveliness, enjoyment and safer environment through merging public and private lives. They are the symbolic power of public and icon of democracy. The need of protection of such important spaces is yet to be realised.

Destruction (and degradation) of public spaces in Kathmandu metropolitan city (KMC) is taking place in many forms. Existing public open spaces are being converted into built spaces by the government itself. The central open space in Kathmandu originally measured two-third miles in length and about 300 yards in width.[1] However, only small fraction of it is left at present due to construction of 'Rani Pokhari' (pond with a temple at the centre) by King 'Pratap Malla' in 1671; development of 'Ratna Park,' 'Dasarath Stadium' and 'Shahid Gate' (Martin Memorial) and Nepal Army's office. Moreover, many shop owners have encroached the community spaces of residential courtyards, public streets and pedestrian lanes by extending their commercial activities and displaying the products. Illegal occupation of public lands along the riverfronts and in religious buildings (temple, rest house, etc.) either by constructing structures or by using them for private purposes is quite common. Pedestrian footpaths have been narrowed down while widening the vehicular roads in many parts of Kathmandu. The

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[1] According to Henry Ambrose Oldfield (in his book Sketches of Nepal) Tundikhel originally spread from Rani Pokhari in the north to the Dasarath Stadium in the south is one of the Asia's biggest parade grounds at that time.

city comprises of only 6% open space (compared to 10-20% in other metropolitan cities of the world) with per capita organised open space of 0.97 sq. m. (which is about 9.7 sq. m. in Delhi) (Pradhan, 2003)[2].

Numerous public spaces of historical and cultural importance in KMC have been transformed in the past few decades under public private partnership program with varying degree of implications. Among them, the 'Dharahara-Sundhara' (DS) square located in ward no. 22 of Kathmandu is crucial due to its location, historical context and the mode of redevelopment. The form and function of this square has been transformed many times in the past. Nine story 'Dharahara' tower was completely collapsed in the April 2015 great earthquake. There are confusion among design profession and KMC regarding redevelopment of DS square. Against such backdrop, this paper critically reviews transformation process of DS square before the earthquake in order to set a framework for post-earthquake reconstruction. The paper focuses on the pre-earthquake period redevelopment process carried out under public-private partnership program. Critical review of such transformation process is meaningful not only to evaluate the outcome of the public-private partnership program but also to formulate public policy on post-earthquake redevelopment. It first reviews literatures on public space in an urban setting to find out different dimensions of successful public space. It then studies DS square redevelopment process and then presents major weaknesses. Those shortcomings

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[2]*Caminos and Goehert (1978) recommended an open area of 150 sq. m per 10,000 sq. m of built-up area, while the World Bank housing project recommends 20 to 25% open space for a built-up area. For the safety of an individual, a 2 sq. m space is needed. In general, 5-10% open space is needed for housing purposes.*

were also linked with the existing legal and institutional framework. Discussion also sets a framework for post-earthquake reconstruction of DS square before drawing a conclusion and suggesting some key recommendations.

Study area

The 'Dharahara – Sundhara' square located in the heart of Kathmandu covers an area of 2,540 sq. m. The 'L' shape open space comprises two historical monuments: a nine storey tower known as 'Dharahara' (Bhimesen Stamba) built in 1825 and golden sunken stone water spout, Sundhara, constructed in 1928. Many important sites are in close proximity: Huge parade ground known as 'Tundikhel' (army parade ground) and Martin memorial (Shahid gate) on the eastern side (Figure 1.1a). The old Malla Palace (durbar square) and secretariat office (Singha durbar complex) are at walking distance from this place. On the north side of the site is the business centre (commercial and residential) whereas in the west and south sides are the mixed zones of institutions and commercial activities. Approachable from at least five different non-axial paths, this square spatially acts as a 'transitional space' between the 'transportation nodes' at 'Shahid-gate' and in front of 'Nepal Airlines Corporation Office (Micro bus and three wheeler stand) and 'commercial zone' of 'Khichapokhari,' 'Bhotebahal,' 'Baagh Durbar' and New Road areas (Figure 1.1b). The plaza itself is surrounded by institutional buildings from three sides except the commercial activities on the west side (Figure 1.1c).
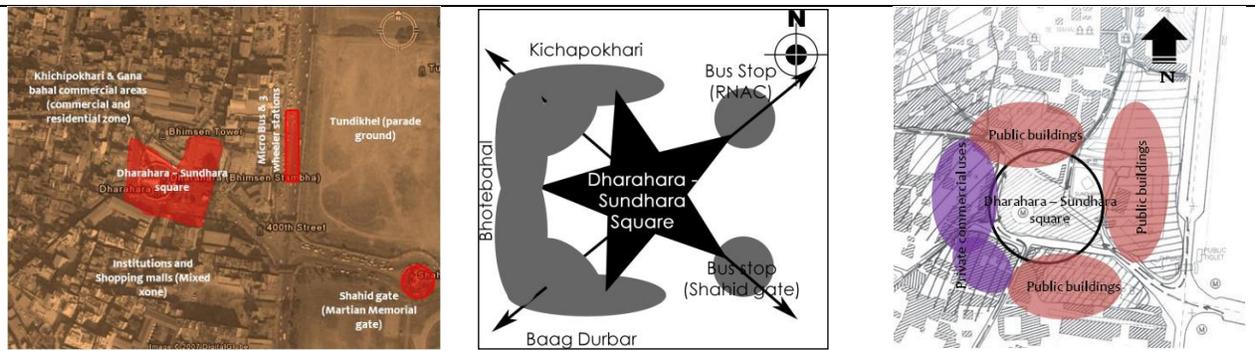
| (a) Major activities around the plaza | (c) Square located in the transition zone | (b) Buildings surrounding the plaza |

Fig. 1.1 Location and immediate surroundings of 'Dharahara – Sundhara' public space

Data collection and methodology

Different techniques were used for data collection and carrying out study. First, numerous literatures on public spaces were critically review to understand the features of public spaces. It constituted collection of information from books, articles, local newspapers including surfing of internet. Second, those features were critically examined in the study site. Most of the data and information particularly of the usages of public spaces were taken many years before the April 2015 earthquake. The DS square was observed in different time period in holidays as well as in working days. The site was also revisited after the earthquake to find out the situation of various facilities within the square as well as use of the open spaces by general public. While visiting the site, its immediate surrounding and adjacent areas were also observed to find out their spatial linkages. Third, the square users were also asked unstructured questions on the impact of redevelopment, differences between past and present state of the square and their suggestions for the improvement. Fourth, the local club members, private party engaged in the redevelopment and KMC staffs were consulted many times not

only to get the information on redevelopment work but also to get their views on specific issues. Both the general public visiting DS square and KMC and Department of Archaeology (DOA) staffs were also enquired on their views towards reconstruction of 'Dharahara' tower and its surrounding reconstruction. Various information and data collected through different means were analysed and synthesized to find out the strengths and weaknesses of the redevelopment process.

Successful public space and its different dimensions

Though historical spaces were the result of intuition, traditional rules of thumb, social conditions, and the limitations of available materials (Moughtin, 1992), understanding of different components along with their underlying complex mechanism together with conscious thought and application of pre-perceived set of design guidelines can produce 'responsive' public spaces (Bentley et al, 1985) with human feelings and sensibilities. Each particular place is the result of relationships between actions, conceptions and physical attributes and these three notions make the sense of place (Nenad Lipovac, 1997), which is embodied in the location, spatial configuration and articulation of a place (Norbeg Shulz, 1980).

A public square creates a gathering place for the people, humanising them by mutual contact, providing them with shelter against the haphazard traffic and freeing them from the tension of bustling through the web of street (Spreiregen, 1965). As public spaces are non-exclusive, available to all, and held as community property, they should not only allow maximum opportunities for socialisation and participation (Gehl, 1987; Marcuse, 2006) in festival, ceremonies,

parade and other forms of celebrations but should also be safe, comfortable and responsive to climatic and weather conditions to rejuvenate public life and entertainment (Lennand and Lennand, 1995). Accessibility, the most effective factors and deterrents to increased utilisation of and achievement of social interaction in a public space can be judged by its connections to its surroundings, both visual and physical (Whyte, 2000).

To be democratic public spaces, involvement of users (and citizens) in decision making process underlying the creation and management of them is essential (Paddison, 2003). Public spaces, the loci of power and politics (Gould, 1996) provide the playing field for dissent and protest, where diverse sets of users might declare and deliberate opposing options and viewpoints. There is diminution of a democratic public sphere than the actual reduction of physical public space (Sorkin, 1992; Mitchell, 2003).

With innovation of new technology and integration of national and international finance, development companies are becoming larger, more complex and more powerful (Madanipour, 2003). Positioning security guards, installing camera and in some cases even taking photographs for monitoring the movement of people while entering certain facilities in public and semi-public spaces have further reduced the privacy, freedom of access and free use of those facilities (Cohen, 1996). Such trend of privatisation of development with domination of business values has undermined an earlier pattern of social interaction by diverse groups and public political expression in cities (Davis, 1990; Zukin, 1995). Cities that focus on

bigness, profit and self-aggrandizement are anathema to the themes of scale and humanity (Davey, 1999).

Successful public space should perform four main functions: access and linkages; purpose and activities; comfort and image; and sociability. They pay dividends for cities, building civic pride, increasing tourism and economic investment, and contributing to health and quality of life (Rogers, 2003). As a result, they can contribute to the collective identity of the community (Franck and Paxson, 1989). The true public space should be responsive, democratic and meaningful and its formation process is guided by three 'critical human dimensions – the users' essential needs, their spatial right and the meaning they seek' (Carr et. al, 1992) under the influence of a number of sociological, environmental, planning, political and economic dimensions (Castells, 1989; Stilwell, 1993). Ownership of public space, control over access to it including the designated uses are the three major attributes that constitute the socio-political nature of public space (White, 1998). As public space is directly related to 'good local environment' and provides a tool with which quality of life can be measured (Williams and Green, 2001), its design and management is vital to the future of urban life and culture (Worpole, 2001). It can educate the city-dweller about the 'other' and can teach true urbanity (Lofland, 2000).

Redevelopment process

On May 2004, an agreement was done between KMC and Side Walkers Traders Pvt. Ltd. (SWT) for the redevelopment of DS square. As per contract, for leasing the site for 20 years, the SWT will pay

NRs 60,000[3] per month to KMC. In lieu of that, it will construct in the open space series of shops, a garden, souvenir shop, flower shop, communication centre and a restaurant with a public toilet including installation of a status of 'Bhimsen Thapa,' the first prime minister of Nepal, besides using the tower and sunken spout for commercial use. It will also hold the right to charge people a fee for observing the historic tower. In addition, if SWT gets embroiled in any legal action again, KMC will compensate it.

The redevelopment work was commenced from November 2004. It comprised of three phases. In the first stage, renovation and refurbishment of 'Dharahara' together with construction of a 'smoking free peace park' around the tower was carried out. The tower was insured with National Life and General Insurance Co. Ltd. (NLG) against NRs 10 million to cover damages by fire, earthquake, strike, malicious damage and other causes. The insurance also covers those who climb the tower. The SWT already completed all these works. The second stage comprised of demolition of incompatible structure, construction of reversible tourist rest place and building of retail outlets in the north side. All these works have also been finished. The last stage which is yet to be started is the renovation of 'Sundhara' and peripheral development.

However, the 'gorkha' earthquake of 25th April 2015 caused collapsed of 'Dharahara' tower killing altogether 180 lives. Except a small portion of lower part, the whole tower was turn over. It took many weeks just to clear the debris around DS square. Even after nearly two years of the earthquake, no one is sure about

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[3]US$1 = NRs. 73.5 on May 2004

redevelopment of DS square. Some people prefer to rebuild this tower as it was before the earthquake; others propose to plan this area for 'earthquake memorial park' without any tower. Discussion and controversy is also there on whether it should be rebuild by the Government of Nepal with tax payers' money or it should be done by the private sector, Side Walkers Traders (SWT) as per agreement with KMC. Some private sector companies had announced their willingness to reconstruct the tower on their own cost.

The prime minister while inaugurating the reconstruction process of 'Dharahara' in February 2016 announced to commit his one month's salary for the citizen's fund citing it as symbol of Nepalese unity, strength, and identity. The new design will retain the original style with underground parking provision. Also, the Department of Archaeology has sought a budget of NRs. 300 million from the government of Nepal for the reconstruction and expected to complete the work within 5-7 years. One of the local architectural firms has already development sketches of the redevelopment plan: multiple layers of underground parking, extension of park towards the east by dismantling the existing Post Office Building and building another similar 'Dharahara' just in front of the existing one. Except these progress, no work has been proceed so far.

Results and findings

Disintegration of physical form and of spatial linkage

Before the pre-earthquake period, DS square was a singular unit, anchoring the peripheral buildings with 'Dharahara' acting as a landmark. Instead of reinforcing this attribute, formation of a diagonal pedestrian path from 'Khichapokhari' to the 'Sundhara' and

the curved vehicular street from 'Sundhara' turning towards the north to Te-bahal has physically divided the square into three isolated units: one is the raised platform comprising 'Dharahara' and a greenery park encircled by boundary wall with a gate at the centre; the second is the recently opened retail outlets in the north-west corner and the last part is the neglected 'Sundhara' with small open space in the south side (Figure 1.2). The erection of ticket house, retail outlet, boundary wall of the greenery park together with the encircling vehicular streets in the south and west sides and the confusing edges in the north and south have not only reconfigured the physical form but have also isolated the square from the surrounding enclosing buildings.

The square can function as an 'outdoor room' with a strong sense of spatial containment in the vertical and horizontal planes if it maintains certain qualities on the floor and the enclosing buildings. However, the case of DS square lacks such qualities. The floor of the square has three different levels with two types of pavements. The 'Dharahara' and its immediate surrounding has greenery park at the highest level whereas the retail outlets and its front open space is stone paved at intermediate level and the remaining part, i.e., Sundhara area has also the flag stone paved floor at the lowest level (Figure 1.2).

| (a) Division of square into subspaces | (b) The greenery park – highest level | (c) The retail outlet – intermediate level | (d) Small open space – lowest level |

Fig. 1.2 Changes in level and different floor material in the subdivided spaces of the square

The buildings enclosing the square have large variation in terms of building bulk, volume and height, architectural style and detailing, materials used and colour combination. More than half of the peripheral buildings especially public buildings - Nepal Bank Limited and Department of Mint in the north, the General Post Office building in the east and Nepal Telecommunication Corporation Office and Controller Office of Ministry of Defence in the south - are isolated from the square and the surrounding buildings through a huge boundary wall thereby ignoring the existence and life in the square. Absence of continuous building façades and lack of unifying design elements together with poor articulation of rooflines against the sky has further diluted the feeling of enclosure and sense of containment.

Poor physical design such as construction of wall and gate, positioning of security guard at the entry gate and the surrounding vicinity, absence of well-defined and inviting entry points, visual obstruction combined with vehicle parking, Cobbler's activity and haphazard location of street vendors have not only made public

access (physical, visual and symbolic) difficult but also restricted the freedom and right of other people.

Domination of commercial spaces with reduction of free entry

Significant percentage of open space has been used for a singular purpose by building Greenery Park with a facility of toilet, restaurant and souvenir shop. The park together with the tower has been fenced keeping a security guard at the entry point. One has to pay an entry fee[4] even to go inside the park and on the periphery of the tower. The construction of new retail outlet in the north-west corner and extension of new shopping arcade of Kathmandu Mall (Sundhara Mart) towards the square from the east side has further reduced the free use of open space but has increased the business activities within the square. The remaining triangular shape two open spaces – one in front of the retail outlet and another on the south of 'Sundhara' with temporary stalls and few wooden benches – are free to use.

Pedestrian movement and vehicular traffic has been found the most dominating activity within the square in the morning and evening. In the morning (around 8:00 am), the park is watered and shops start to open (Table 1.1 and 1.2). Few persons can be seen standing in the triangular open spaces. At noon (12:00) more people are found to be engaged in these subspaces: customers shopping in the retail outlets; people climbing the tower; and others sitting on the benches

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[4] *An entry fee of NRs. 99 for Nepalese and NRs. 299 for tourist is charged with 50% student discount (only on Tuesday) and free of charge for senior citizen aged 65 and above. The structural analysis allows 15 persons to climb the tower at one time.*

and boundary walls of 'Sundhara' for Sun bathing, reading newspapers and enjoying the street view. Flow of pedestrian and vehicular traffic has been found increased in the noon but the volume exceeded on the working days. On holidays, the 'Dharahara' has been climbed by maximum number of people compared to other days.

Table 1.1 Changes in activities in the subspaces at different time period on Saturday and holidays

Particular	Dharahara & greenery park	Sundhara & southern space	Retail outlets on the north
Saturday and holidays			
8:00 am (morning)			
12:00 noon (noon)			
6:45 pm (evening)			

Huge area covered by the Park is used by few people in most of the time. General public feel that the small triangular open spaces are also dedicated to customers due to their small size and location adjacent to commercial activity. As open spaces outside the boundary wall has no shed (except the footpath of the recently opened retail outlet) and lighting provision[5] at night, these spaces are hardly used during rainy season and at night.

Table 1.2 Changes in activities in the subspaces at different time period on working days

Particular	Dharahara & greenery park	Sundhara & southern space	Retail outlets on the north
Working days			
8:00 am (morning)			
12:00 noon (noon)			

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[5]*Electricity is available inside the Park*.

| 5:00 pm (evening) | | | |

The open spaces just outside the plaza are occupied by either Cobbler (in the east and south of a greenery park) or bikes and cars (west and south of Dharahara). In the morning on all days, the number of Cobblers and parked vehicles is small, but it increases in the afternoon and evening. The vehicle parking activity dominates most of the spaces (in the east, south and west sides) during the working days which is reversed on Saturday and holidays with concentration of Cobblers (Table 1.3). By renting this space to private sector for vehicle parking, the KMC has gained some economic benefits but at the cost of blocking the physical access and separating the activities of the square into two parts – one inside the boundary wall and other at the periphery of the streets along the embracing buildings. These functions are replaced by street vendors at night. Lack of street lighting coupled with mixing up of haphazardly spread vendors (selling cloths, utensils and fast foods) with parked vehicles (few in number) has created a confusing crowd particularly at the entry points (General Post Office and Khichapokhari sides).

Table 1.3 Changes in activity just outside the Square at different time period

	Periphery of green park (east)	Periphery of green park (south)	Periphery of Dharahara (west)	Periphery of Dharahara (south)
Saturday and Holidays				
8:00 am (morning)				
Working days				
12:00 noon and 5:00 pm (evening)				
6:45 pm (night)				

More than half of the encircling buildings are office buildings with boundary walls whereas the ground floors of the remaining buildings have retail shops, restaurants and trade and tour offices. Activities on the edges of these buildings are not physically, visually and psychologically separated from the functions inside the plaza due to boundary walls and parking provisions at the edges of the plaza.

Degradation of historic and symbolic meaning

The nine storey tower (Dharahara)[6] and the 'Sundhara,' one of the biggest and artistic water spouts of the Kathmandu Valley are significant in many ways. Moreover, this square used to be an intercity bus park with many ticket counters encircling the complex and development of lodges and hotels in the surrounding vicinity[7]. In 1986 under city beautification campaign, the bus park was shifted to the eastern side of 'Tundikhel' and the whole square was simply raised with brick pavement from the encircling streets. People of different age groups used to engage for multiple functions at different times of the day in different seasons. Thus over a long period of time, many people have developed a 'meaning' to this place with 'connection' at various levels. However, the reconstruction work neither recognises the importance of the meaning and connection nor assists the development of associative meanings that are special to the present time and place and the experience of the emerging culture. The renovation and reopening of the tower – revitalisation of urban heritage and boosting of civic pride – is limited to those who are willing to pay at the cost of isolating the tower from the surrounding spaces through fencing. There is already loss of two taps of 'Sundhara' (eastern and western taps) and cessation of water supply from the artistic taps. Instead, dirty water is logged in the bottom layer due to blockage of water source and drainage, all due to heavy construction of 'Kathmandu Mall'[8], next to the square. In such situation, it is doubtful that the

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[6] *Though the tower was originally 76.2 m high, it was kept only 61.9m in reconstruction after 1934 great earthquake.*
[7] *There still exist some ticket counters as well as lodges or hotels towards the south and west sides of the square.*
[8] *This new commercial complex is owned by Provident Fund.*

revitalisation of 'Sundhara,' which is yet to be done, addresses the historical background and community's sentimental feeling.

Discussions

Lost opportunity of creating a truly public plaza

The opportunity to extend the square up to the peripheral buildings through demolition of the boundary walls and allowing the ground floor of those buildings for public uses so that the whole area can act as a unifying singular plaza has been lost. The KMC could have designated this area as a 'comprehensive redevelopment zone' and through urban design guidelines and provision of incentives, the square could have developed as a new address as well as integrated with the surrounding buildings. Staffs working in various surrounding buildings could have used this plaza during lunch time.

Instead of developing this square as an urban park with provision of today's urban culture (festival, performances and concerts, ceremonies and celebrations and other events[9]) and public art to retain users' interest and commitment to the place, the present design has converted the previously developed different meaning, experiences and collective memory of the place into shopping and entertainment activity for limited people. The experience of urban space – combined interaction of visual, acoustical, thermal and tactile information – has been weak due to fragmented nature of space without well-defined buildings, walls, arcades or pavements

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[9] *Large display screens in the public space act as windows broadening the potential of use and participation. Moreover, the presence of art increases the appeal of spaces as well the experience of the city, acting as a goods for consumption in the form of culture and entertainment.*

and boundary. As a result, the earlier experiences and memories of individuals or groups connecting them to the site have been lost forever. The sense of belonging, ownership and pride in the space could not achieve.

Privatization of public spaces

The present development has converted the whole DS square into the place that serves retail and business interests with exclusion of other uses. It has conferred direct benefits (mainly economic) to the private sector (investor) and elite group but the indirect benefit (mainly social and environmental) to local communities and society as a whole is doubtful.

Significant reduction of public space has adversely affected the people's relaxation, socialisation, communication and celebration of events at regular intervals thereby weakening the social ties and public life in the square and hampering the scope of bringing people from different walks of society together at city level. It is the lower income and working class people who has suffered a lot as they rely on public space for recreation, socialising and symbolically staking their claim over a piece of the city. Vulnerable section namely women, elderly and physically disabled or mothers pushing carriages have found difficult to use the square.

The contractual nature between the two parties clearly reveals that the ongoing construction is different modes of privatisation of the public square. First, the KMC allowed the SWT to use the tower, water spout and 2,540 sq. m. of public open space for commercial purpose by taking monthly rent of NRs. 60,000. Second, it gave

planning, maintenance and management authority to SWT including power to charge entry fee for not only climbing the tower but also for entering the peripheral greenery park. Last, the KMC has transferred its ownership of the site to SWT by leasing the site for 20 years. In addition to these, the extension of business activity – new retail outlets of Kathmandu Mall (Sundhara Mart) from east side and the construction of new retail shops in the north-west corner - has further intensified the commercialisation in the square with numerous negative consequences.

Inadequate legal and institutional framework

As planning standards and urban design guidelines for the redevelopment of public square do not exist in Kathmandu (and Nepal), the existing building bylaws, which is mainly concerned with individual buildings and applicable for only new construction is the only legal vehicle to regulate the transformation of DS square.[10] The bylaws categorise DS square into two zones[11]: 'Dharahara' and 'Sundhara' including enclosing buildings of east and south as 'Open greenery sub-zone (Tundikhel)' and the reaming enclosing buildings of the north and west sides as 'Preservation Sub-zone' both under the 'Old Urban Area' (KVTDC, 2050 BS). Though the clauses regarding construction of buildings in both the sub-zones are vague and confusing, nonetheless, the redevelopment work at the square does not comply with the existing bylaws in many ways. Construction of retail outlets on the public space is against the existing bylaws. Development of Greenery Park and fencing the

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[10] *The existing building bylaws require the quantitative area of the open space based on the total development size in new development; however, there is no mention regarding qualitative aspects of public space design.*
[11] *Urban plaza is not a space in two dimensions but it is the space together with the surrounding embracing buildings that give the enclosure to the square.*

whole complex excluding ordinary people who do not pay entry fee and allowing vehicular entry within the square no way complement the preservation of square. Moreover, KMC's decision to allow paid parking and Cobbler's activities on the outer periphery of the boundary wall is not logical.

This project has been carried out under the state of controversy and confusion. The site was leased to SWT for 20 years without inviting tenders. None of the concerned people namely officials of Environment Department within KMC, Chairman of ward no. 22, board members of KMC, 'Sankata Sports Club' members including local community was familiar with this secret contract between the mayor and the promoter of SWT (Himalayan Times, 2004). Intense protest on the KMC's earlier attempt of developing a Greenery Park and constructing a café by leasing the site to the same private party in 1998 clearly reveals that the local community is against the present development. No appraisal was done on the technical and financial aspects of the redevelopment. The KMC which enforces the implementation of the bylaws and advocates for conservation of cultural heritage is in fact doing something opposite that degrades the public space and erodes the value of historical monuments. Instead of upgrading the outdated and ineffective bylaws, it has facilitated the commercialisation of public space for the short term economic benefit. Its activity encourages the individuals to neglect the cultural artefacts and to default the building bylaws.

Setting framework for post-earthquake reconstruction
The rebuilding 'Dharahara' tower in post-earthquake period needs to address three interrelated issues, which requires extensive public

discussion and urban designer's opinion. First, the destroyed 'Dharahara' measuring 61.9m was rebuilt after the 1934 earthquake with change in architectural design and addition of round balcony with reduction of two story (originally 11 story) by Juddha Shumsher in 1936. However, from November 2004 after an agreement between KMC and SWT Private Limited has changed the earlier function of 'Dharahara' from military use to viewing tower. Thus, the function and design of the destroyed 'Dharahara' was not original one and such changes were carried out in the past. Second, there were a lot of controversies while leasing the whole complex to STW for 20 years: inadequate transparency in the deal, lack of financial projection on KMC part and destruction of public plaza by building commercial structures as well as Greenery Park through provision of entry fee in public open space – all clearly demonstrated the privatization of public spaces. As a result, direct benefits (mainly economic) to the private sector (investor) and elite group are visible with social and environmental benefits to communities and societies are not apparent. Hence, this trend must be reversed and the lost public spaces must be regained in reconstruction proposal by cancelling the earlier agreement. Third, the DS square comprises of 'Sundhara' and public open spaces altogether around 2,540 sq. m not only represent the heritage of 'Rana' period achievement but it has also become different meanings and experiences for individual and groups due to its transformation from military tower, intercity Bus Park, waste land, simply raised platform, political protest point to present state of domination of shopping and commerce. The destruction of the tower in the recent earthquake has added another important layer in this place. Such collective memory of the place with heritage value must be acknowledged in redesign process.

Conclusion and recommendations

Though the initiation of public-private partnership between KMC and SWT for redevelopment of DS square is appreciable and the redevelopment work was successful to bring some visual changes in the previously neglected site, the whole program carried out in the state of controversy and confusion lacked in depth contextual study analysis, consisted of numerous planning and design shortcomings and exemplified the lost opportunity. Poor technical capability of KMC coupled with lack of urban design guidelines and existence of ineffective building bylaws has further accelerated the privatisation of public spaces.

In terms of architecture and urban design, the subdivision of spaces through changing the floor level, fencing the park and building retail outlets has not only created a chaotic and confusing landscape but also disintegrated the square from the surrounding fabrics. Socially, the earlier multi-functional spaces used by all age groups in different time period are under transformation into a more circumscribed and regulated place with reduction of effective open spaces but intensification of business activities. Economically, the cost-benefit calculation has overridden the community's needs undermining the public dimension of the public square. Politically, the privileges of free civil expression, mobilisation and organisation of rally and processions available for any citizen at any time has been curtailed and the democratic 'civil sphere' is being reduced merely to a sphere of consumption. Finally, in the whole redevelopment process, those facilities which can be commercialised and give economic returns are first developed: renovation of 'Dharahara' and development of a greenery park; construction of retail outlet and so on.

To reverse this trend, a threefold strategy of developing a mechanism in public private partnership program to use private money for fulfilling the public needs as well as ensuring the investment return, formulation of urban design guidelines ensuring social and political needs of public place and support from local people and clubs including strengthening of the City is essential.

Due to its location in the transitional zone between 'commercial hub' of New Road and Khichha Pokhari and 'transportation nodes' of Shahid Gate and NAC (Nepal Airlines Corporation), the reconstruction of 'Dharahara' must consider this site context and human scale integrating Sundhara, the public open spaces along with the peripheral public buildings (Nepal Bank Limited, Department of Mint in the north, the General Post Office in the east and Nepal Telecommunication Corporation and Controller of Ministry of Defence in the south). The DS square should be designed as an urban plaza by preserving the remaining structure of the dismantled 'Dharahara' in its present state within a triangular glass structure. Above it, a new 'Dharahara' shall be built with modern steel structure (up to 11 story in its original state) with style exhibiting present day's development of science and technology but with modern facilities such as viewing spaces, earthquake gallery, and souvenir shops within the tower itself.

All the earlier commercial shops along with Greenery Park must be replaced by urban plaza design with provision of today's urban culture (festival, performances and concerts, ceremonies and celebrations and other events) and public art to retain users'

interest and commitment to the place. Numerous surrounding public building must be designed responding to DS square with dedication of ground and lower floors for public facilities. Such well-defined buildings and pavements will further enhance experience of the plaza through interaction of visual acoustical, thermal and tactile information. As a result, the earlier experiences and memories of individuals and groups connecting them to the site can be regained thereby achieving the sense of belonging, ownership and pride in the complex. Use of tax payer's money and pedestrian focus in design will further enhance its publicness in democratic society.

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Planning and Design Principles of Catholic Church Emerging Church Architecture in Nepal

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Background and study objectives

Church architecture is generated from the fundamental believes, historical evolution and traditional practice, and the activities, services and liturgy of the Christian congregation. Christians believe that the 'Bible' is the Words of God, it is one of the ways for God to reveal thyself to human and it is the guideline for people working out of Christian life. The majority of Christians consider their church to be either a place for fellowship, or a place where they can refocus their lives and enhance their spiritual growth, mainly through worship on Sundays. Christianity entered into Kathmandu valley in 1628. However, their activities in social and development works as Christian mission organisations were visible from the 1950's. The Churches begin to flourish spiritually and physicallyafter the political change in 1991 in general and declaring Nepal as a secular state in 2007 in particular. As per population census of 2011, Christian

constitutes 1.4% of total population which was only 0.5% in 2001 census. As the attempt of the National Churches Fellowship of Nepal (NCFN) established in 1959 to keep all denominations under one umbrella was not realised, many Churches belonging to different sects are visible throughout the country: Pentecostal, Assembly of God, El Shaddai, Presbyterians, Conservative Baptist, Evangelical, and Independent Church. They have been running their various activities in most cases in adapted buildings. The numbers of trained priests, fathers, parishes and other staffs are inadequate in many churches. Though Churches are struggling for their authenticity, meaning and relevancy in the present changed global context, it is emerging as a new vocabulary in Nepalese architecture. Against these backdrops, this paper aims to explore on Catholic Church architecture with threefold objectives. First, it studies the philosophy, theology and design principles of Catholic Church. Second, it compares and contracts the Church design in Nepal and abroad. Third and last, it draws a conclusion and proposes some key design framework for future Church design in Nepal.

Catholic Church architecture

Church architecture started from worshipping stone and earth alter to the tabernacle (tent of meeting) of simple courtyard form has been transformed into monumental scale with elaborative decoration in Baroque period (1600-1750) (Fig.2.1). The relation between human and church underwent a radical change after the industrial revolution. Many churches built since the 1960s in different parts of the world were designed in a secular modern architecture form rather than traditional church design passed down from the Roman and Byzantine empires.
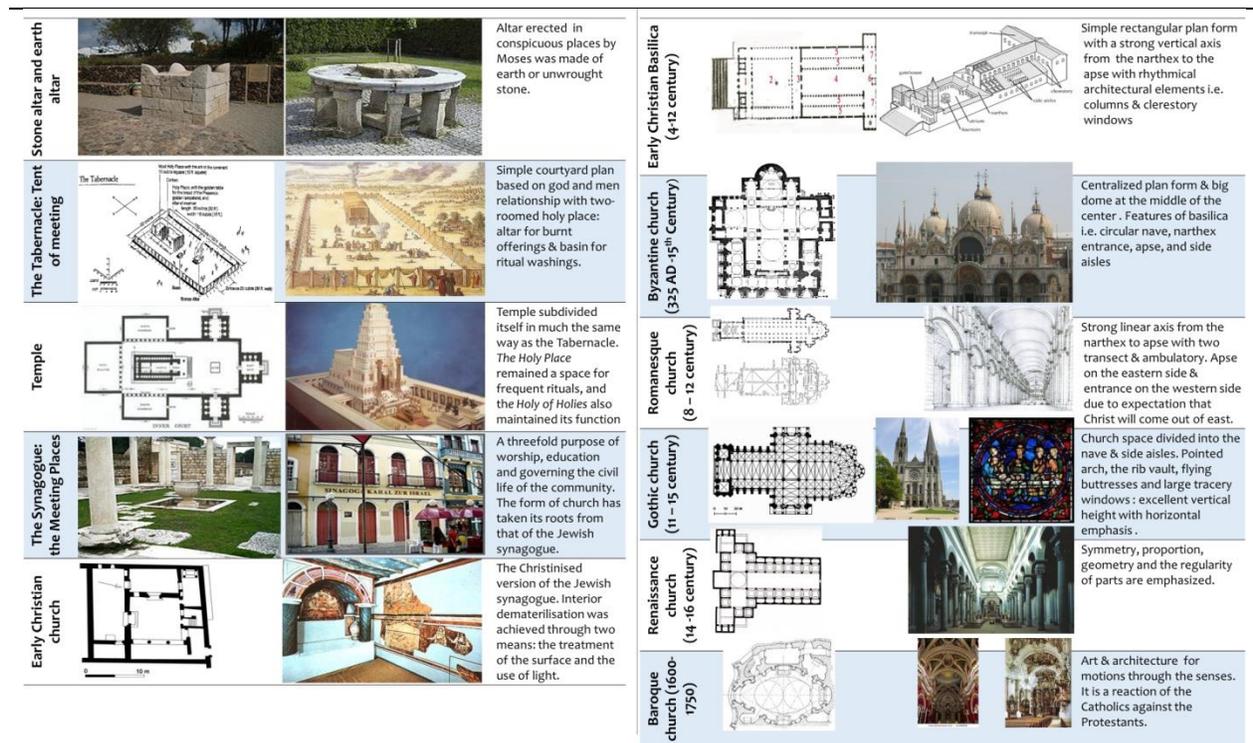
Fig. 2.1 Evolution of worship places of Christianity

Philosophy of Catholic Church can be perceived from different angles. Biblically, it pleases the Lord Yahweh to break unjust fetters and undo the thongs of the yoke, to let the oppressed go free, to share one's bread with the hungry and to shelter the homeless poor, to clothe the man you see to be naked. Historically, it was mandated to both spiritual and physical needs to its faithful as well as to those within its reach: through schools, hospitals, the creation of jobs and networks, the establishment of technical centres and small handicraft industries. Theologically, the Christian ideal of 'diakonia' developed in concert with that of the Old and New Testament origins, especially as regards the connection between practical service and public worship.

Design of a Catholic Church needs to be considered three elements. 'Verticality' symbolises reaching for Heaven and creating a cavernous space, physically dwarfed reminding God whereas 'Permanence' denotes Church serving generation after generation. Transcending time and culture must be constructed of durable materials. Iconography represents the visual reference points for contemplation, to serve as a teaching point about the faith. It is often analogues with the Christ's body (Fig. 2.2).

Social teaching of Catholic has four elements. *Human dignity*: all people are created in the image and likeness of God, and each individual maintains an inherent dignity and infinite worth. *Community and common good:* Human are depended upon each other to meet basic material needs. One must look to fulfil not only one's individual well, but work to build a society to benefit all people. *Participation and subsidiary:* at all levels of society people have the right to participate in the decision making process concerning issues that affect them directly. *Preferential option for poor:* Christian community at every level engage actively in struggle to overcome the social injustices.

Christs head		Ape – seat of governance represented the bishop's cathedra
Christ's choir		Throat – the chants of the monks issue forth the praise of God
Christ's transepts		Extended arms
Christ's torso and legs		Nave
Christ's body		Gathered faithful
Christ's feet		Narthex, where the faithful enter the church
Christ's heart		Crossing of the alter
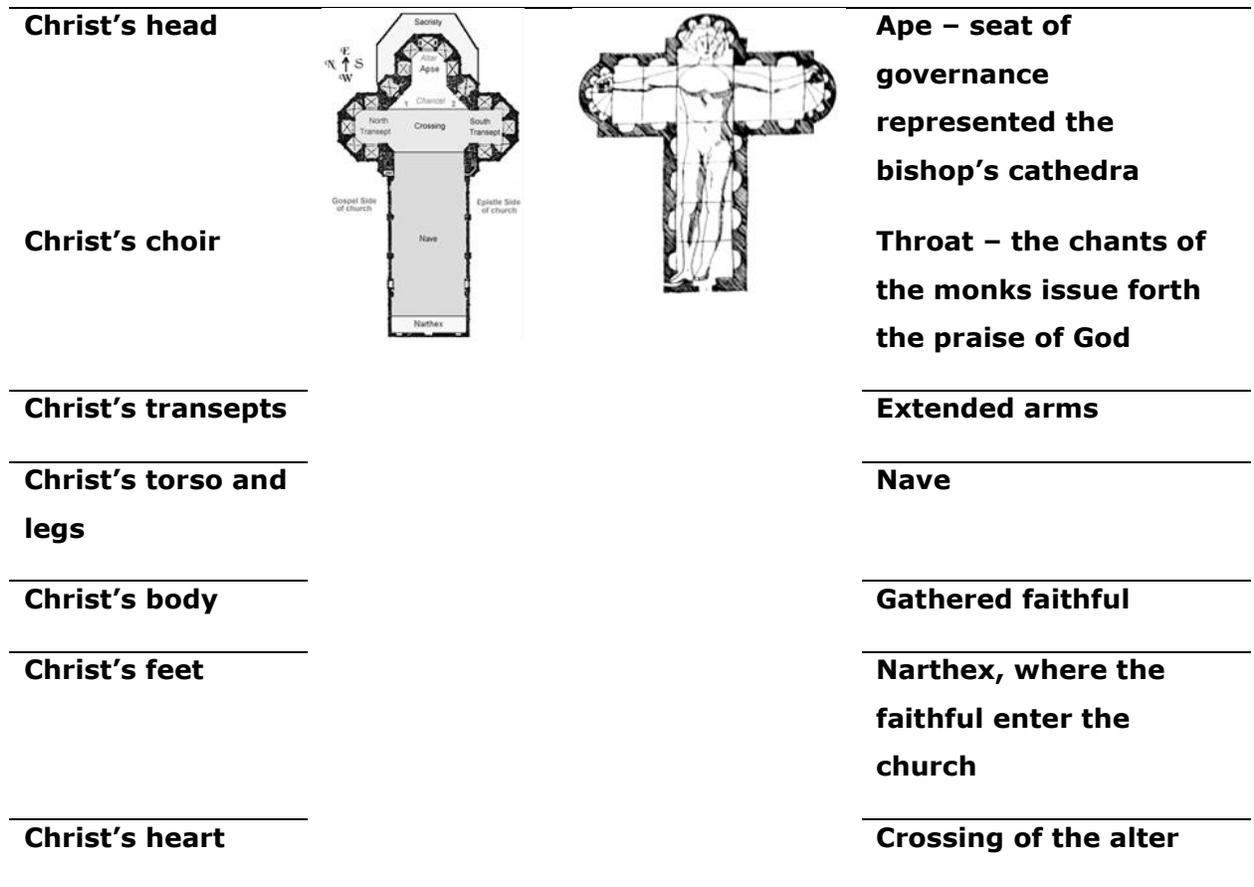
Fig. 2.2 Church design based on Catholic theology

Many modern liturgists use 'people of God' without and 'the body of Christ' and additionally 'the temple of the Holy Spirit.' Church needs to bridge the gap between the material world and the spiritual world. Church design must look to the spiritual use as well as the physical use of the buildings. In many church design, circular form has been used for people's assembly and the rectilinear form as 'body of Christ' and 'people of God' (Fig. 2.3).

| Traditional hierarchical structure | People of God hierarchical structure | Form symbolising body of Christ and people of God |
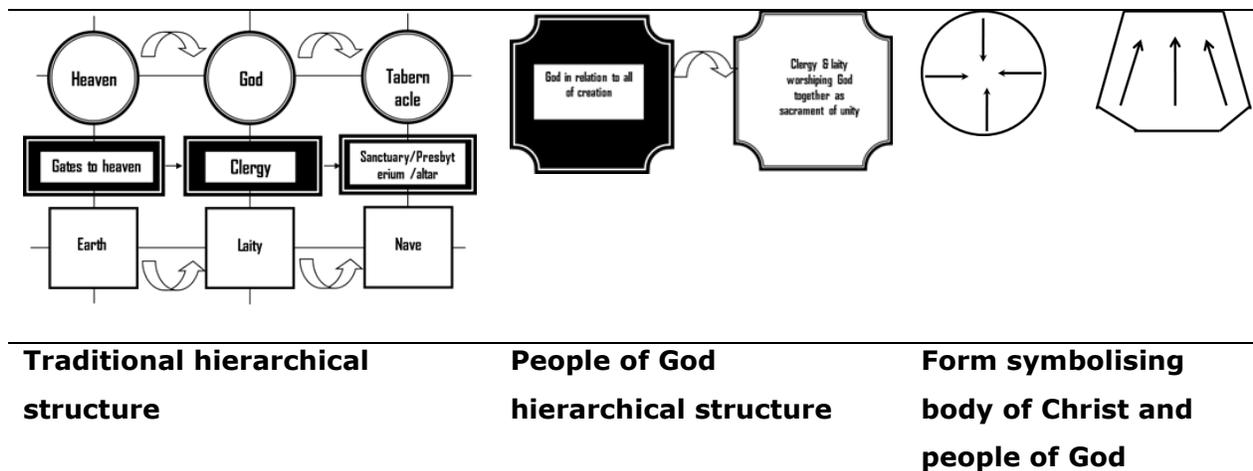
Fig. 2.3 Various forms symbolising different parts of Church

Communal and sacrificial elements exist in the Eucharist but a few modern theologians and liturgists dwell on only the meal aspect. Orientation in regards to the liturgy, hierarchical structuring, and past precedents allow all participants in the liturgy facing in the same direction towards God (Fig. 2.4). Traditionally, one would enter the church from the west and face east during the liturgy. Many modern liturgists has no importance on orientation the apostolic tradition of facing the east, both in the building of churches and in the celebration of the liturgy. Since Vatican II, in the name of 'active participation,' priests have begun to face the congregation. Prior, the Tridetine Mass (Latin Mass) was said with the priest and congregation facing the same direction. In this case the priest's back would be towards the people.

| During liturgy of the World | During Liturgy of Eucharist | Orientation of Priest & parish | Versus populum |
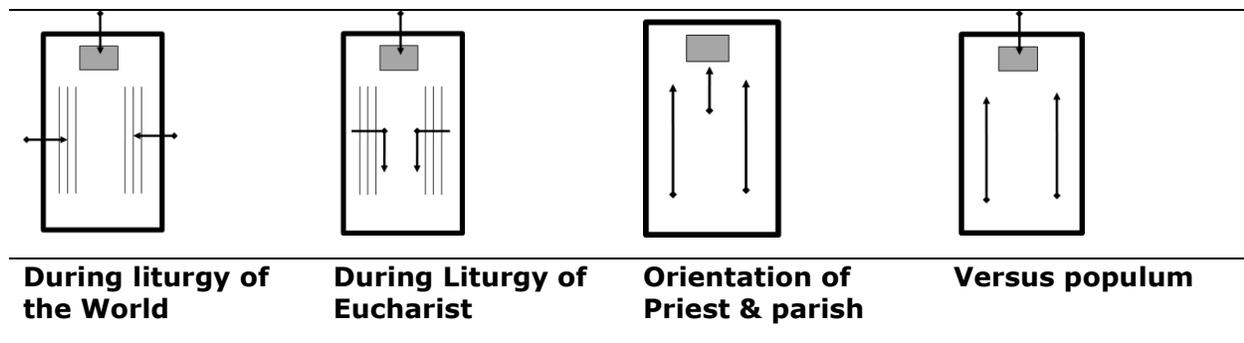
Fig. 2.4 Changing form of the gathering

The relationship between the God, Spiritual leader and the mass inside the congregation hall has been changed (Fig. 2.5). In the past, the spiritual leader received word from God and communicated that message to the congregation during Sunday service (Fig. 2.5a). In other type, spiritual leader is not more important than the individual forming part of the congregation, who can take part in the preaching of the Gospel in the form of speech, music and dancing (Fig. 2.5b). However, in modern churches, the emphasis is not on the building but the activity, the well-being of the congregation thereby forming modern commercialized church building (Fig. 2.5c).

| (a) God-Spiritual-Mass | (b) God in equal relationship with spiritual leader and mass | (c) Emphasis on activity in modern church |
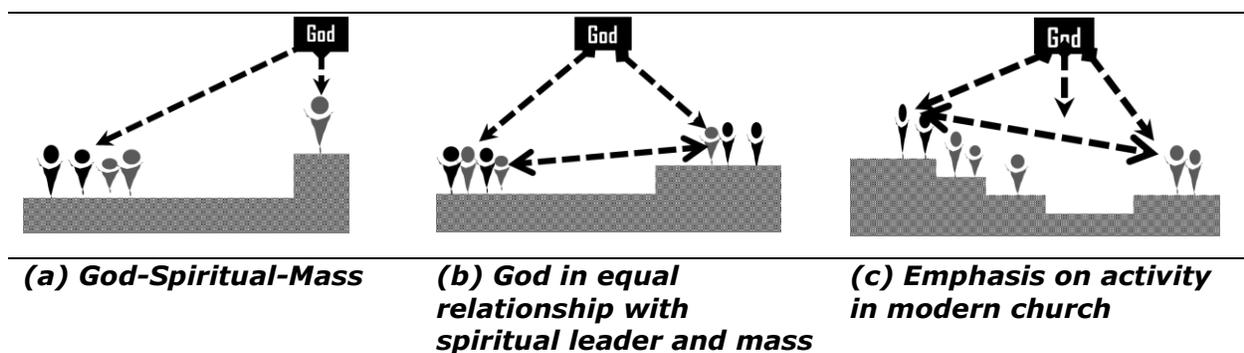
Fig. 2.5 Transforming the relationship between God, Spiritual leader and Mass in the hall

Acknowledging the growing distortion on the Catholic Church planning and design, the Vatican II gathering confirmed the

following facts, which facilities future Church construction (Table 2.1).

Table 2.1 Church design principles after Vatican II

Principle 1	The Church is a people before it is a building: the church is not a place but a person, the Body of Christ, member for member.
Principle 2	Worship spaces exist to serve the assembly's liturgy, not vice versa. Although environment (space, furnishing, ritual objects such as ambo, altar, and font) inevitably shapes the assembly that uses it, the 'full and active participation by all the people is the paramount concern, for it is the primary, indeed the indispensable source from which the faithful are to derive the true Christian spirit.'
Principle 3	Participatory liturgy requires a participatory Church.
Principle 4	Christian workshop is not 'altar-centred' or 'ambo-centred' but both, the two parts which go to make up the Mass, viz, the liturgy of the word and the Eucharistic liturgy, are so closely connected with each other that they form but one single act of worship.
Principle 5	Christian worship is the starting point, not the destination: Liturgy is actively with a profoundly eschatological character, it is food for the journey, but not eh journey's final goal.

Different interpretation of the principles of Vatican II Council has posed challenges in the Christian faith and church design. Religions to many people became a subordinate matter to consider in their daily life or simply ignore it. Moreover, with increased population in communities, government agencies and commercial adventures addressed other functions the church once facilitated.

Catholic Church architecture – International cases

Among the five internationally famous architects, including Frank Gehry, Peter Eisenman, Tadao Ando and Santiago Calatrava, Richard Meier won the competition for the design of the Jubilee Church (Dives in Misericordia), located in the vicinity of a working class neighbourhood, some six miles east of central Rome. Completed in 2003, this Church covering a 108,414 square-foot complex (having a church and a community centre) is an example of a modern church design (Fig. 2.6).

Fig. 2.6 Site plan and location of the Jubilee Church

The plan relates to the triangular site. The weekday chapel is separated from baptistery by a rectangular block of three reconciliation rooms which are entered directly from the chapel (Fig. 2.7). The sacristy is arranged vertically with the workroom at the western vertical translucent glass wall of the nave. A stained glass oculus above the sacristy provides a natural back light for a cross surmounted by a figure of Christ. The two courts are expressly provided to accommodate both formal and informal communal assemblies. The other court is enclosed and paved for formation and

various processional assemblies that are an integral part of the annual church ritual. The entire complex is a site for both formal and informal celebration. The main nave seats 240, and a day chapel seats 24. The four level community centre functions as a key gathering place for social, educational, and recreational activities. The proportions of the complex are based on a series of displaced squares and four circles. Three circles of equal radius generate the profiles of the three shells that, together with the spine-wall, make up the body of the church nave- and discretely imply the Holy Trinity. The three concrete shells define an enveloping atmosphere in which the light from the skylights above creates a luminous spatial experience, and the rays of sunlight serve as a mystic metaphor of the presence of God. At night, light emanates from within creating an ethereal presence and animating the landscape. On the main facade, there is a tower with five bells, corresponding to the five continents. The church interior is as impressive as its exterior is spectacular. The light bathes the curved walls of the space, offering ever changing experience to the visitor. A prism placed in the altar area, and fenestrations using inclined planes to achieve indirect lighting, recalling the effect of the church of Notre Dame du Haut, Le Corbusier, which Meier is declared admirer.
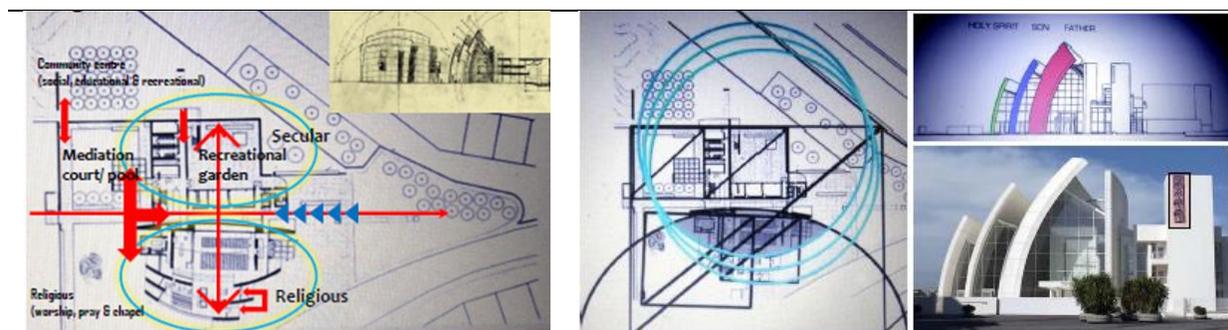

Fig. 2.7 Jubilee Church – Layout plan and symbolism

Architecturally, the building complex is very impressive, nonetheless, it has some flawed particularly in fulfilling traditional symbolism of Catholic Church. First, the building, though iconic in nature, is not easily distinguishable from any other secular masterpiece. The church is oriented towards the west, a typical mistake. Even though the entrance is in the west, the people seated in the nave would be facing west too. The church could have easily been oriented so that the Mass would be said facing the rising sun. Second, looking at the sanctuary area from the nave there is no distinguishing transition; this clearly de-emphasises the hierarchal structure of Church as well as the religious importance to what liturgically occurs in the sanctuary. There is also no defining door or transition that demarks the transition from the world into God's house. This is because many of the spaces flow freely together with only partition walls separating spaces. Third, as interesting as the asymmetrical space is within the church, many issues arise with the placement of certain elements. First, even though the altar is centred on the aisle, it is not centred in the space. The crucifix, ambo, and tabernacle are not given any sense of hierarchy or greater importance than anything else in the space. The crucifix is not axially connected to the altar which creates a disconnection between the two items. The tabernacle is not located in the sanctuary as well, which makes it difficult to say that it is in a most worthy place of greatest honour. The confessionals do not allow for privacy because the priest and penitent can be seen while in the confessional. Even though this allows for a connection between the nave and the confessionals, it really does not allow the privacy a penitent should have during confession. Second, the baptistery is

located just to the left of the nave which allows for easy connection to the altar; the problem is that it is not located near the entrance reducing its symbolic nature of being the entrance into the Church. Though the simplicity of the space seems quite contemplative it lacks one of the basic parts of Catholic architecture, iconography. This eliminates any distraction from the liturgy, but it is truly a modern day iconoclasm. The church has consistently stressed the importance of images and statues to portray the incarnation of Christ as well as connect each parish to the greater Church of saints and angels. While the Jubilee church is a beautifully designed building that draws worldwide attention, it seems to beckon to architectural pilgrims rather than Catholic pilgrims looking for God's eternal truths.

Church of Water, Hokkaido, Japan

Designed by Tadao Ando in 1985, this Church is a small chapel covering about 6773.00 sq. m. site with 520 sq. m. of floor area. Ando believes that spirit of culture and the feeling of presence of nature in contemporary society is important rather than copying the past building form and style. According to him, a sacred space must be related in some way to nature to create a microcosm that combines brilliantly concepts on the profane and the sacred, the artificial and natural, the enclosed and the exposed, the emptiness and the infinity. The composition of the Church is based on the intersection of two volumes (a prism with a square based on 15 sq. m. and a cube of 10m per side) that share a corner in an area of 5X 5 m. (Fig. 2.8). Use of light, and the ascetic aesthetic of Zen Buddhism has further enhanced the symbolism of the Church.
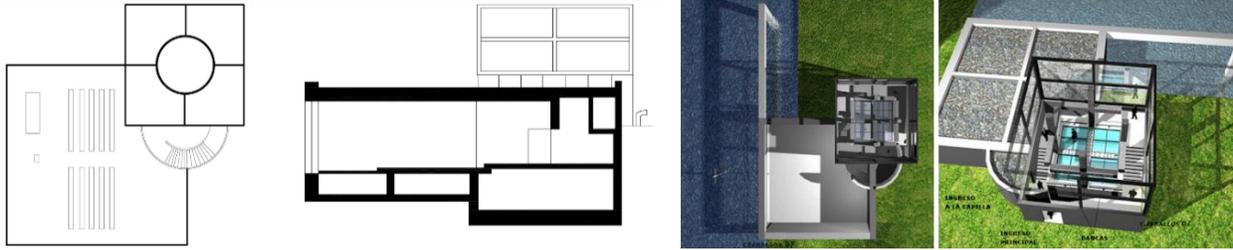
Fig. 2.8 Church planning – form and shape

Next to the chapel lies a concrete porch of 6.2m high, holding a beam that extends a span of 9.15m. The visitor enters under a glass and steel cube leading up and around the crosses, and then down the connecting dark spiral stairway before entering the chapel – transition space between profane and scared spaces. The chapel is separated from the waiting area by a semi-circular step that helps define the cylinder entry. From there the visitor is lead to the waiting room and is inscribed below the square of the 4 crosses. Visitors are struck with the view of the pond with a steel cross placed in the middle of the pond, a rectangle of 45 X 90 m, divided into four 15 meter platforms, that provides a virtual compound which connects the church with nature, clearly visible water square but with which the user can not establish physical contact (Fig. 2.9).

Fig. 2.9 Inside and outside spaces of the church linked with nature

Architecture tries to dominate emptiness and emptiness also dominates the architecture. It is not God but, rather, man in nature

that is the focus of this chapel. To experience God in this natural setting, perhaps, is to experience the encounter with one's own spirit. The sanctuary is essentially an open ended shallow box, overwhelmed by a flat artificial pool, when the only separation between the two territories, a large glass wall, is rolled to the side, it erases any distinction between interior and exterior. In this church, the altar area is depressed rather than raised, a gesture that increases the sense of spatial continuity and that is echoed in shallow terraces in the pond. An external 5 cm and an internal 60 cm thermal coating were added to the 25 cm concrete walls, achieving a thickness of 90 cm. The walls of the chapel housed fenestrations that provide a light source while establishing a pattern next to the exposed concrete grid, a typical signature of the buildings of Ando.

Assumption Church, Lalitpur, Nepal

Designed by Tom Cris in 1994, this Cathedral dedicated to 'Our Lady Virgin Mary' covers about 1552 sq. m. with main building of about 590 sq. m. and is located in Lalitpur. Its design is characterised by crucifix layout plan along with use of geometry, natural light, vernacular building materials and traditional Nepali style. Axial planning of altar, nave and narthex has been maintained (Fig. 2.10).
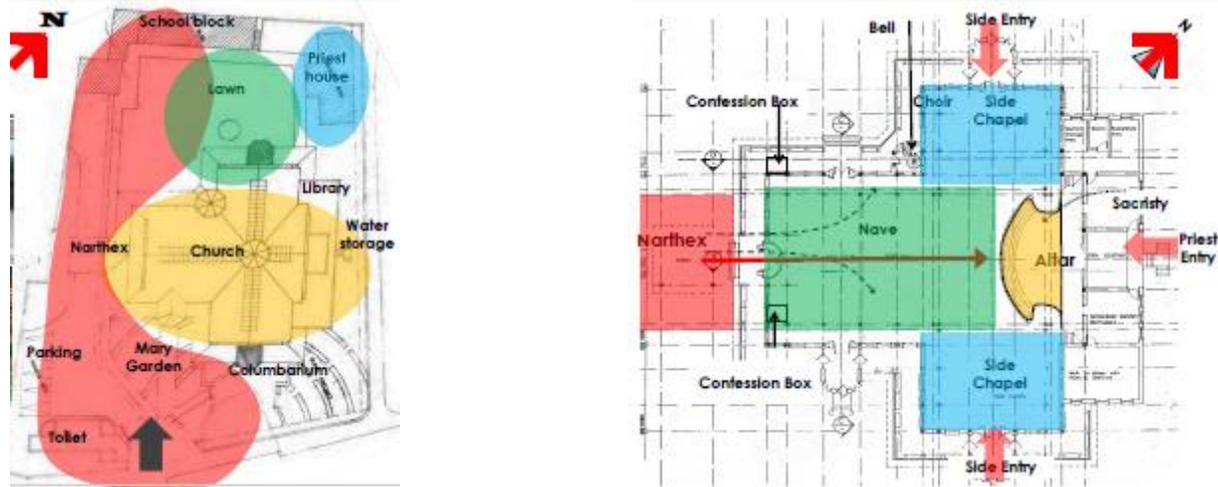
Fig. 2.10 Plan and layout of the Hall

The liturgy requirement has been considered for the layout of different spaces of the church. Mass gathering and prayers are facing towards the east. There is separate entry for priest. The lawn anchors the church, school and priest house, whereas a Mary garden acts as a transitional space between secular and sacred spaces. The spire and the five wounds of Jesus symbolise the elements of Mt. Meru whereas biblical icons, statues and decoration are being provided to bring heavenly presence of God. Ten steps in pulpit symbolize ten teaching of Jesus.

No window has been provided at eye level to focus on the players in mass gathering (Fig. 2.11). Diffused light allows as mental peace but clerestory windows are provided for the diffused light and ventilation. The architectural reflects the vernacular tradition of Nepalese architecture with reference to Christian typology. Despite all these design features, no space is apparent for baptismal font. Placement of confession box could be better. The mass distribution path is crowded at narthex. About 33.2 sq. m. of alter area for

twelve clergy might be congested. Due to lack of spaces, kitchen and other gathering area are lacking.
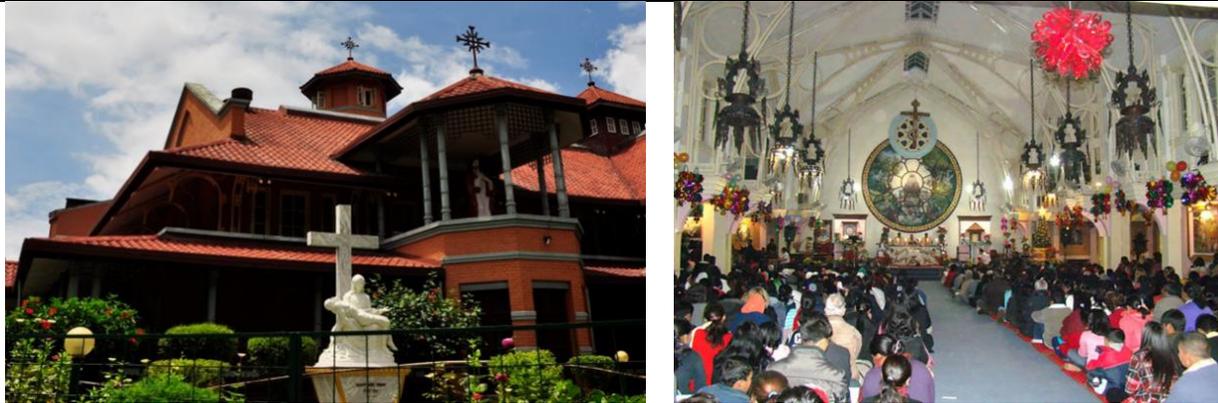
Fig. 2.11 Architecture and interior of the gathering

Conclusion and design framework for future church design

Catholic architecture should be sensitive to the tradition and history of the church, and incorporate aspects of this tradition that are still pertinent today. However, the architecture should also convey sensitivity to the needs of the people in present times. In order to do this, the building must relate to local culture. It should also use symbols and images that connect Catholics to their sacred Tradition and at the same time, create new images and symbols that relate to modern men and women. The architecture should be beautiful and well detailed, inspiring wonder and awe of God; a place where people can encounter the divine. However, this detail should not call attention to itself, but be directed to the purpose of drawing attention to the ritual sacrifice of the Mass and to truths that are being expressed.

Church must fulfil the gap between the two design styles and create an environment for integration of religious celebration and social activity. Church architecture should fulfil the liturgical environment for faithful participation in ritual celebration by retaining the architectural and symbolic relationships between important pieces of the buildings. Consideration of acoustics, lighting, building material and modern technology should be used to complement the sacred environment for worship. It should be, in all and one, that pays the interactive role in encouraging new attitudes and perspectives to our daily existence and the necessary role for the interaction between the public and the users, care-givers and receivers, love and beloved; a place where re-integration of the fragmented and disjointed world of the present is possible and a hospitable place where community can be found. It should act as monuments to community cohesion and physical markers of a sense of place in the city besides evoking visual and social as well as religious sentiments. Church should always be the pioneer of the society and shape the future of it; it should response to the God's justice and love, to sacrifice herself for the poor and for those being pushed about. All these facts can be put in the abstract form as shown below (Fig. 2.12).
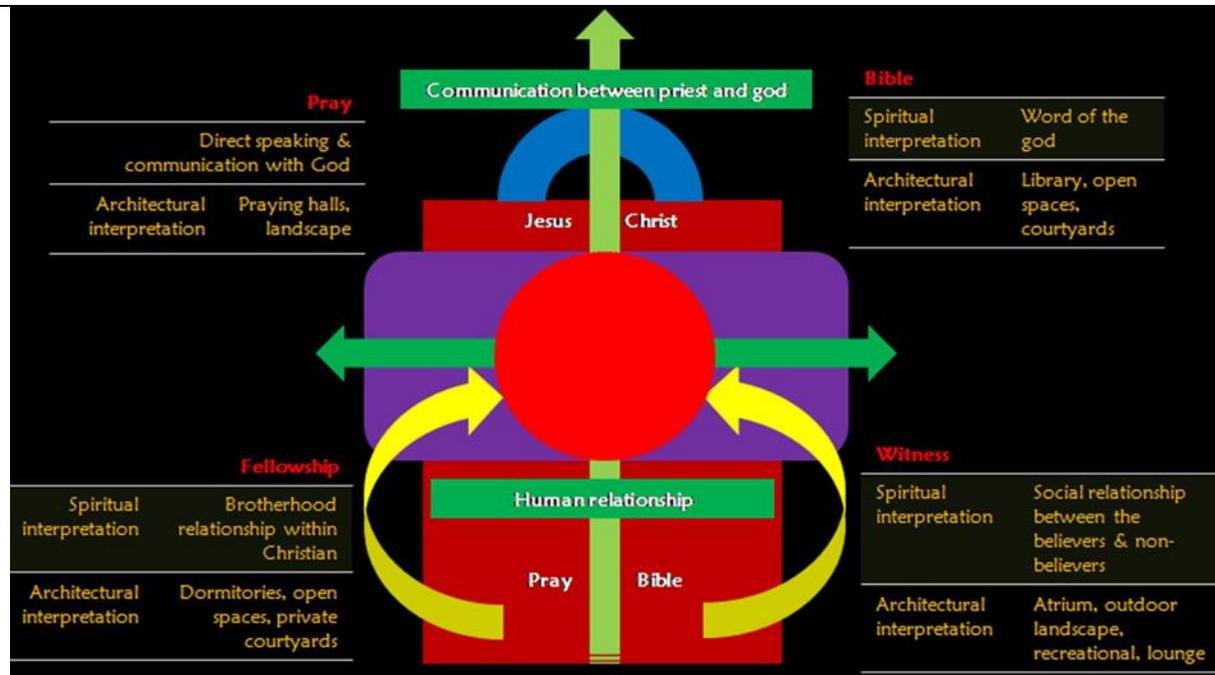
Fig. 2.12 Proposed principle of the Catholic church design

Church design shall combined various aspects: liturgical environment of church, worship place and modern requirements of church (Fig. 2.13). In Catholic Church, the buildings must first meet the liturgical requirements and maintain of tradition and the faith handed down by Christ to the disciples. The Church has the eschatological significance. To enter into the house of God, one must cross the threshold, which symbolizes passing from the world wounded by sin to the world of new life to which all men are called.
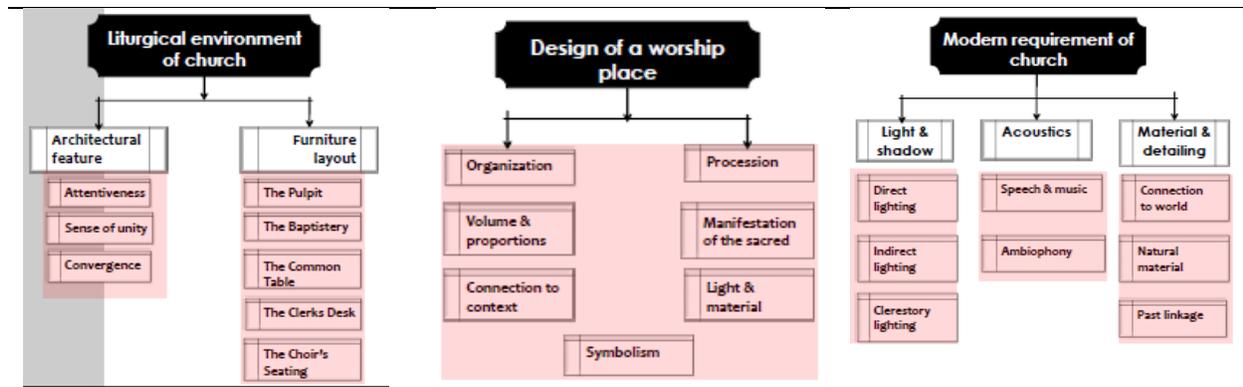
| Liturgical environment of Church	Scared environment of worship place	Modern requirement of church

Fig. 2.13 Combination of various aspects in church design

Church shall be understood from various aspects: as an event, as a place, as a group as an institution (Fig. 2.14).
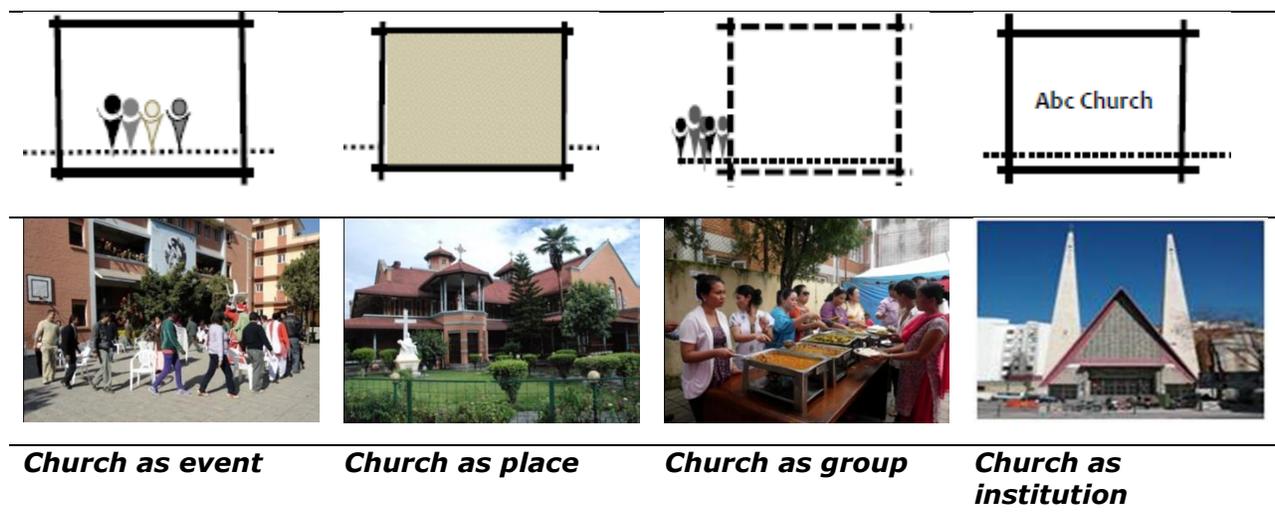

Church as event	Church as place	Church as group	Church as institution

Fig. 2.14 Church having various meaning

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Revitalization of Rajkulo of Bhaktapur

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Contextual background

Ancient cities of Kathmandu valley have well-developed system of water supply network consisting of 'Rajkulos' (royal canals), ponds, 'hitis' (sunken water spouts) and system of canals that carry water from source to these 'hitis.' Each ancient cities like Kathmandu, Bhaktapur, Lalitpur, Kritipur, Banepa had a separate 'rajkulo.' Rajkulo as a traditional engineering innovation serves both rural area for irrigating agricultural lands as well as drinking water in the urban areas (Fig. 3.1). Water tapped from the foothills of the surrounding mountains are brought up to neighborhood level through 'rajkulo,' ponds, aquifer and sunken water spouts and wells. Such water considered as holist and sacred has cultural value. Sunken stone spouts, wells and 'jharu' (water tank with tap) were built by the then kings and wealthy persons mainly for travelers and pilgrims.
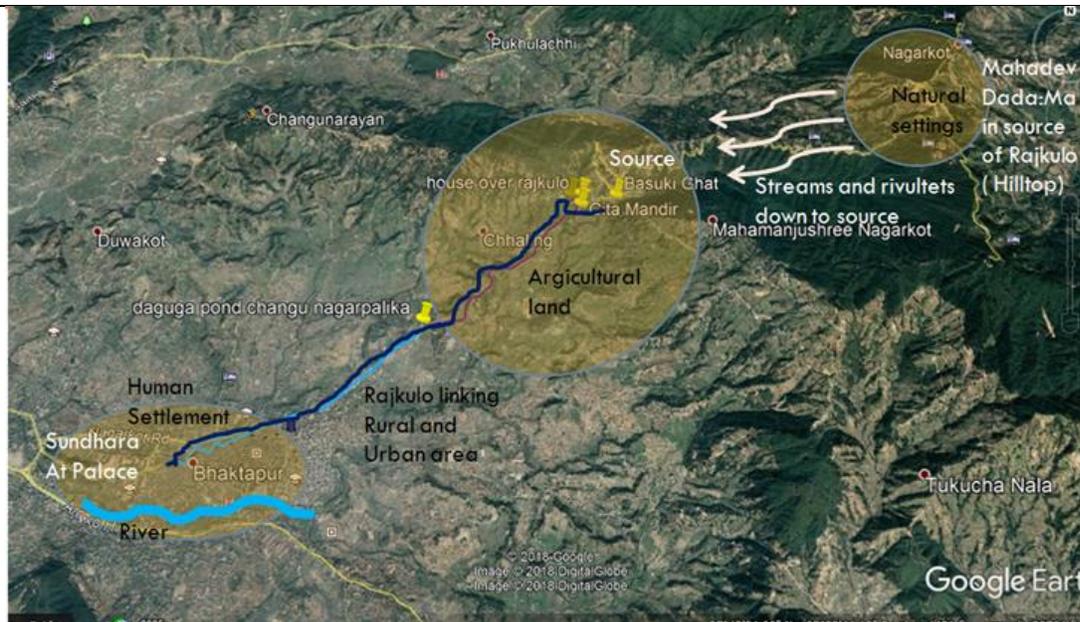
Fig. 3.1 Irrigation and water supply system to settlement of Bhaktapur.

Rajkulo of Bhaktapur was believed to have been built by Tula Maharani and the system was extended by King Jitamitra Malla. The main source of Rajkulo of Bhaktapur is Mahadev Pokhari near Nagarkot. The water from pond then flows down to Kharipati in the form of small rivulets irrigating the nearby farmlands. The system was then carried down to different ponds and 'hitis' of Bhaktapur through underground canal system.

King Jitamitra Malla extended Rajkulo to carry water from Mahadev Pokhari to the golden water sprout (Sundhara). The holy water from Sundhara was used to perform Puja of Taleju Bhawani (royal goddesses). The custom was carried for many years until the water at Sundhara dried due to extensive modernization, pavements of road and construction of houses. Later, modern water pipes were added to feed it. Pujari (priest) of Taleju then carried water from

'Basukighat' to perform 'puja' (pray) at Taleju. Two years ago, a small well of Lichhivi Period near Sundhara was cleaned by officials from Department of Archaeology (DOA) and this water is now being used to for the same purpose. There still are 103 'dhunge dharas in Bhaktapur though many have disappeared in the last decade round. Among them, Dhunge dhara at northern part of Bhaktapur was fed by rajkulo.

Rapid urbanization of the valley together with introduction of pipelines in individual houses from the 1960s has accelerated the negligence of 'rajkulo' and its associated water infrastructure. Against such background, this paper aims to explore the situation of 'rajkulo of Bahktapur' at present condition with threefold objectives. First, it establishes different components of traditional water network system in Bhaktapur and then presents its significant in multiple ways. Second, it elaborates present condition of water network system and finds out the reasons behind negligence. Third and last, it attempts to establish the possible layout of 'rajkulo' in urban area of Bhaktapur.

Components of traditional water network

Traditional 'newari' towns of the Kathmandu valley were located in highlands. Water from relatively highlands and natural settings was brought to lower settlement area through series of rajkulo, ponds, aquifers supported by gravity flow and was finally distributed to settlement area via sunken stone water spouts or 'hitis' (Fig. 3.2). The location and settlement pattern of the town was carefully planned to support flow of water with compact settlement on higher land and agriculture and irrigation facilities on lower land.Water was

brought to the settlement through development of open canal at rural area and closed underground channel at urban area.
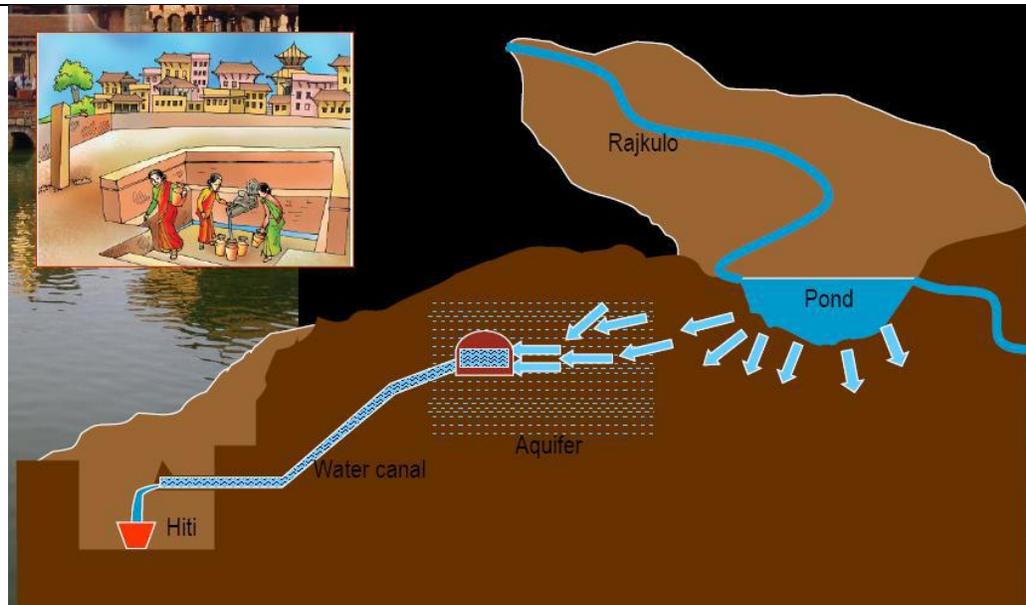

Fig. 3.2 Components of traditional water network system in Kathmandu valley

In general traditional water supply system consists of five major components. The intake is the main sour of 'rajkulo.' It is generally located at highlands. Water is transmitted to the lower irrigated land and urban areas through gravity flow. Rajkulos are generally built to carry surface water such as stream or pond water located at rural natural setting to downhill irrigated land and urban settlement. The sunken stone water spout (dhunge dhara or hiti) is the most elaborate part of water supply system. Shallow aquifers or hiti system not only consist of water spouts but whole complex consisting of various deities and statues representing water like crocodile, 'pati' (rest house) and some hitis also consist of temple nearby thus making it a social and religious space. These hitis were generally started during licchavi period (500 - 800 AD) and was

further developed in the malla period (1420 - 1768 AD). The lichhavi period hitis were less decorative compared to malla period. The oldest existing stone spout is 'Mangaldhara' of Lalitpur, and the most recent one is 'Sundhara' built in Kathmandu. These hitis are generally square or rectangular in shape and placed symmetrical. They are mainly built of stone and in some places wooden hiti are also found which are rare. While the Royal Palace of Kathmandu, Bhaktapur and Lalitpur and some other places have gold gilded spouts popularly known as Sundhara.

Aquifers are underground layers of rock that are saturated with water that can be brought to the surface through various means. Generally aquifers recharge hiti and wells inside the settlement. Ponds (pukhus or pokharis) are constructed in relatively depressed areas so as to achieve good quantity of water from the surface flow. Ponds are one of the major elements of traditional water system. These were fed by water canal (rajkulo) and it in turn feed the sub surface aquifers and then 'hitis' and wells. They are the integral part of ecosystem and important element of traditional landscape.

Ponds are generally of three types: located upstream the settlement, inside the settlement, and downstream the settlement. The pond was constructed for its functional use, for irrigation, fire fighting, cleaning purposes. External ponds are used for recharging aquifer, as ponds to store overflow from 'hitis' and for irrigating fields. Ponds inside settlement are smaller in size and are used for household purpose like cleaning, washing, cleaning of domestic animals, dying of cloths, grey water treatment ,buffer to the down pours during rainy season. It also helps to recharge the ground water. Similarly, ponds downstream the settlement is for controlling flood and

landslide. It consists of used water from other ponds and hiti. Finally, drainage system is considered as the system of disposal of waste water from the household, ponds and storm water. In traditional drainage system, these surface water drainage through the streets were directly disposed towards the fields at lower fertile land.

Rajkulo and its linkage to irrigation cannel and drinking water

Water from the Mahadev Pokhari reaches to the footstep of 'Nagarkot' at 'Ghatekulo' via various streams and rivulets and takes the form of 'Mahadev Khola' or 'Champa Nadi' (rivers).The water was then stored into artificial reservoir known as 'Dangal pukhu.' People were dependent on agricultural land hence these water were previously used for irrigation of nearby farmland, for water mills (for grinding grains) and even for fishing. Later, King Jita Mitra Malla saw the potential of this source and he constructed 'rajkulor to serve drinking water for the Bhaktapur town. This water was carried to Bhaktapur city and fed many 'hitis' and ponds. The overflow waste water from the 'hitis'was also used to irrigate the lowlying nearby farmland of 'Karipati' and 'Challing'adopting the gravity flow technique. The waste water of 'Pulan hiti' and 'Kamal Binayak' are still being drained to irrigate the farmland.

Religious and cultural linkage of rajkulo of Bhaktapur

King Jitamitra Malla made provision for bringing precious water from Mahadev Pokhari to Bhaktapur through the earthen canal. The legend has it that the King had dream and instructed by a deity to

solve the water crisis of the city by managing water from 'Mahadev Khola' (river) at the foothill of Nagarkot. The next morning there was a fog guiding the track of Rajkulo and the canal was dug following that fog.[12] This water was used to worship the Goddess Taleju in the Thanthu royal palace. Before construction of 'rajkulo,' holy water for the deity was brought directly from Mahadev dada.

Since the water from 'rajkulo' were used for holy purpose, ordinary people were not allowed to cross the rajkulo or walk over it. Similarly buffaloes were also not allowed.[13] There was a ritual of worshipping Basuki Nag (serpent) at Basukighat in case water stopped flowing through 'hitis' due to obstruction. If water did not flow even after this ritual, there was another ritual of in form of throwing stones to 'Basuki nag' and it is believed that this ritual opens any obstruction to open up flow of water to Bhaktapur. [14]Also it was believed that there was a steady flow of water from Basuki ghat (crimination ground) to Bhaktapur city that a Duck kept at Basuki ghat will be seen at Luhiti at Thanthu Palace, Durbar Square.[15]'Pani Parne Jatra' is celebrated by locals worshipping god and playing various instruments, asking for rain for cultivation. If there is no rain fall for large period of time. This festival is still celebrated at 'Anantalingeswor mahadev' at Gundu.

It is believed that during the festival of Janai Purnima, if one eats nine different crops, wears nine different kinds of cloths and bath at 9 holy 'Hitis' facing east, one will gain incarnation. [16] Water from

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[12] As per discussion with Mr. Prem Prasad Kafle
[13] From the book entitled 'Bhaktapur Ko Rajkulo'
[14] As per discussion with Mr. Lila Nath Bastola, local at Basuki ghat
[15] A per discussion with Mr. Om Dhaubadel, Historician
[16] As per discussion with Mr. Purshottam Lochan Shrestha, Historian

Thalachhen hiti is used to worship Goddess Mahalaxmi whereas water from Bolachhen hiti is used to pray Mahakali. Water from Indrayani hiti is taken for worshipping Indrayani temple. Water from Sallaganesh hiti is used daily to clean the statue of Buddha. Water Ruche Pukhu at Duimaju complex in Durbar square is believed to cure children

The water necessary for the worship of the goddess Taleju would get foremost preference over irrigation. Later, Bhupatindra Malla, following the footstep of his father Jitamitra, built new 'hits'and renovated the old ones. The inscription of 1740 by Jitrmitra Malla mentioned about system of management of rajkulo. This inscription mentioned numerous charges that one should pay for using water from rajkulo, punishment for defaulters and involvement of citizen for maintenance. The 1775 inscription has mentioned of donation of 10 ropani land by him as homage for Taleju Bhawani and for maintenance of rajkulo and Sundhara.[17]

Present condition of traditional water system in Bhaktapur
The alignment of rajkuko of Bhaktapur can still be seen up to Gita mandir (temple) (Fig. 3.3). The water source has been gradually declining and is inadequate to fulfil the needs of irrigation and urban drinking water. Illegal construction of houses without building permit from the municipality can be observed at this point which has destroyed the 'rajkulo' and stopped its flow (Fig. 3.4). Construction of Nagarkot road has also obstructed the flow of the canal.

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[17] mentioned in the book entitled 'Bhaktapur Ko Rajkulo'

Fig. 3.3 Rajkulo stretch between Ghattek khola (stream) and Gita Mandir (1980 left and 2017 right)

Fig. 3.4 Illegal construction of school over rajkulo at Kharipati and construction of road to Nagarkot

At present, there are 39 ponds within Bhaktapur municipality. They are of two types: one directly fed by rajkulo (inlet ponds) and other fed by discharge from 'hitis' and ponds (outlet ponds). Out of them, 9 ponds have been found fed by rajkulo (Fig. 3.5). Unlike 'hitis, most of the ponds are in good condition. About 16% of them are completely dried and 8% are in neglected condition. Bhaju Pukhu and Bhelukhel Pukhu are completely dried and have been converted

into playground.Kumari Pukhu is also completely dried condition. Bhagwan Dyo Pukhu and Nha Da pukhu are covered with dirt and algae.
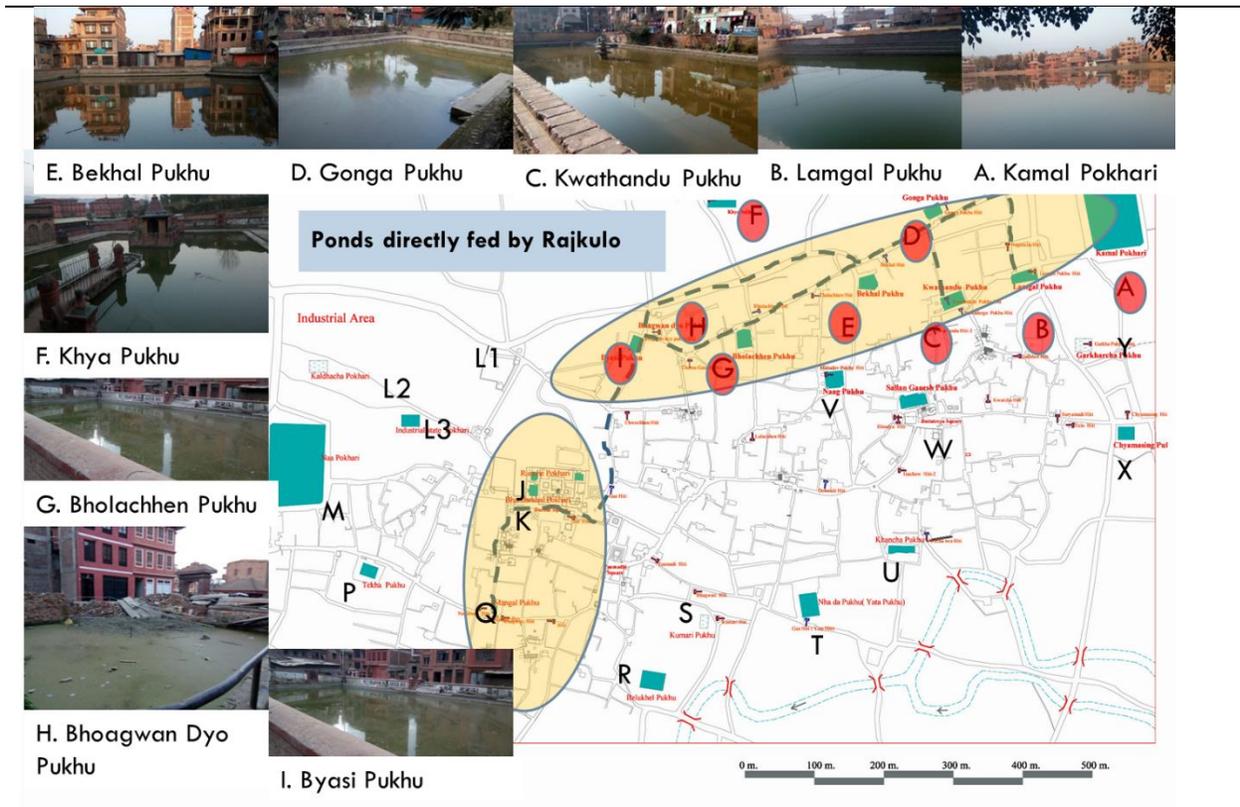

Fig. 3.5 Ponds and hitis within Bhaktapur municipality

But in case of 'hitis,' most of them have stopped flow of water (40%) and no more serves its original purpose. Others are even neglected and in depredated condition (19%). While about 38% of 'hitis' have modern pipeline installed to them and are still in use.

Reason for destruction

Destruction of 'rajkulo' is due to combination of many reasons. First, traditional water network system was damaged by in the 1934 great earthquake. Instead of rebuilding the traditional water infrastructure system, the then autocrat Rana regime diverted water from 'rajkulo' to their palace gardens. During 1970 while implementing Bhaktapur Development Project, water pipelines was installed at individual houses thereby not only reducing the importance of 'hitis' and 'ponds' but also disturbing the underground nature gravity flow system. Second, rapid urbanization and haphazard urban growth led to haphazard construction of individual houses, some of them with basement floor thereby disturbing the water network system. In some cases, even houses were built over rajkulo. Such illegal construction was failed to regulate by the municipality and the concerned agencies. Third, with gradual changing economic base from agriculture to business, the peripheral lands have been quickly converted into urban area with construction of road network and buildings. Fourth, those concerned agencies like Department of Archaeology and local municipality have failed to acknowledge traditional water network system as national heritage and hence little work has been done so far even to find out the network of rajkulo and its connections with various ponds and hitis. At present, numerous agencies such as UNESCO, Department of Archaeology, Bhaktapur municipality, Changunarayan municipality, Department of Water Supply and Sanitation, Department of irrigation are responsible for management and conservation of rajkulo, hitis and ponds. Guthi sansthan and local community based organisations have also been engaged. Department of Archaeology is the main national organizationfor conservation of monuments.

However, rajkulo along with hitis and ponds are yet to be declared as a national heritage. Though Bhaktapur municipality has renovated numerous hitis and ponds, revitalization of 'rajkulo' is being neglected. Surprising, the Department of Irrigation has renovated a part of rajkuko of Bhaktapur from Basuki ghat to Gita Mandir for irrigation purpose. As rajkulo flows through different municipalities, those municipalities without adequate coordination have set different setback for the same rajkulo: 4.5 m from the centre of rajkulo at Nagarkot municipality whereas Changunarayan municipality has put this figure only 4m. Fifth, guthi[18]was responsible for the maintenance of these historical water systems.The political upheaval of 1950 weakened the Guthi system which used to manage land and other historical and cultural heritages. The land owned by Guthi was mismanaged and no resources were left for the maintenance of these heritages. Guthi Sansthan at present has turned blind eyes towards these spouts.

Alignment of rajkulo and ancient settlement of Bhaktapur

Rajkulo as an important element of traditional water network system is the lifeline of the people supporting rural agriculture and urban drinking water. It is an engineering innovation of the past as well as part of ecosystem and landscape. This life line links the permanent source of water (foothills) to aquifer and ponds.

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[18]*Guthis are the institutions formed for the conservation and preservation of public heritages like Hiti, pond, temple etc. as well as for carrying out different religious and social events. The adequate acres of fertile land were allocated for Guthis and the income generated through them would go to the maintenance works and social functions. Community members would also contribute cash and kind in the Guthis.*

It has been found that alignment of rajkulo from Bashuki ghat to Gita mandir still exists and was recently renovated by Department of Irrigation (Fig. 3.6). However, the canal from Gita mandir to Daguga pond has been destroyed due to haphazard building and road construction. Its reminisent can still be seen in the school premise as well as in the form of road side drain. The urban portion of rajkulo from Daguga to Durbar Square (old royal palce) is underground. It has been blocked in many location due to haphazarrd construction of high rise modern structures.
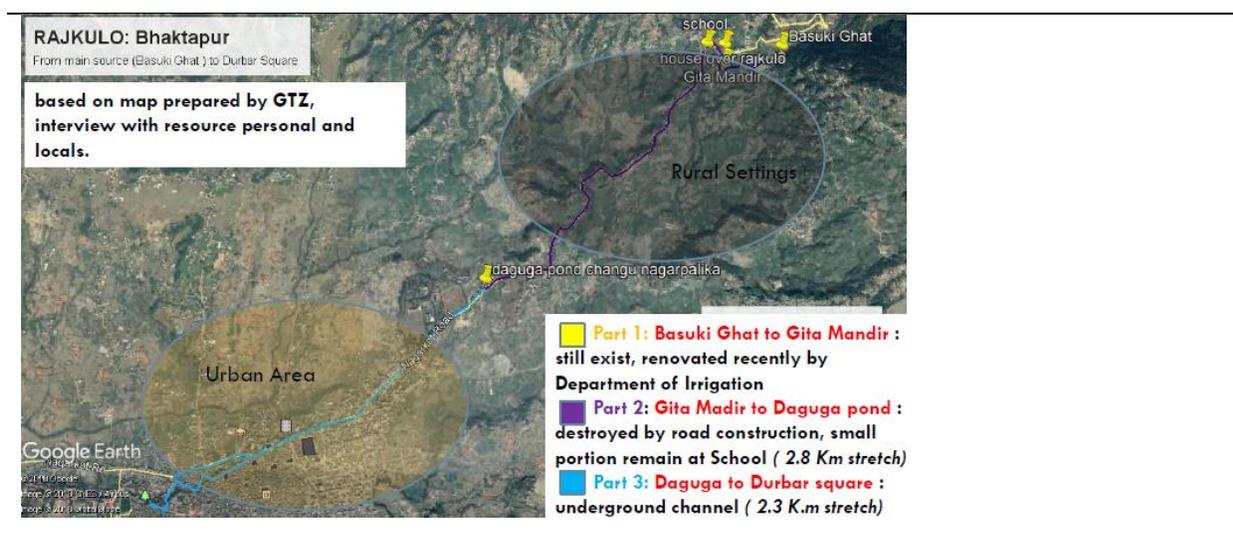

Fig. 3.6 Rajkulo alignment connecting rural to urban areas

Existence of numerous lichchavi period 'hitis' and ponds around Mahalaxmi area and direction of rajkulo from the east towards the west confirms that rajkulo was built up to this area during lichchavi period, which was also mentioned in 'Gopal Vamsawali' (Fig. 3.7). Rajkulo was extended to the west at Chanagal area at the time of Jayasithiti Malla. Main streets were developed along the major line of rajkulo whereas secondary streets were built along the sub distribution system. Hitis and ponds were placed along these

secondary streets. Two major ponds were built at that time: the inlet ponds recharging hitis and outlet ponds. Outlet ponds were generally placed at low land area near river to discharge overflow. Temples were located at strategically important points for protection of rajkulo. Ponds were designed following 'vastu.' Outlet of ponds placed on NE corner towards the streets.[19]
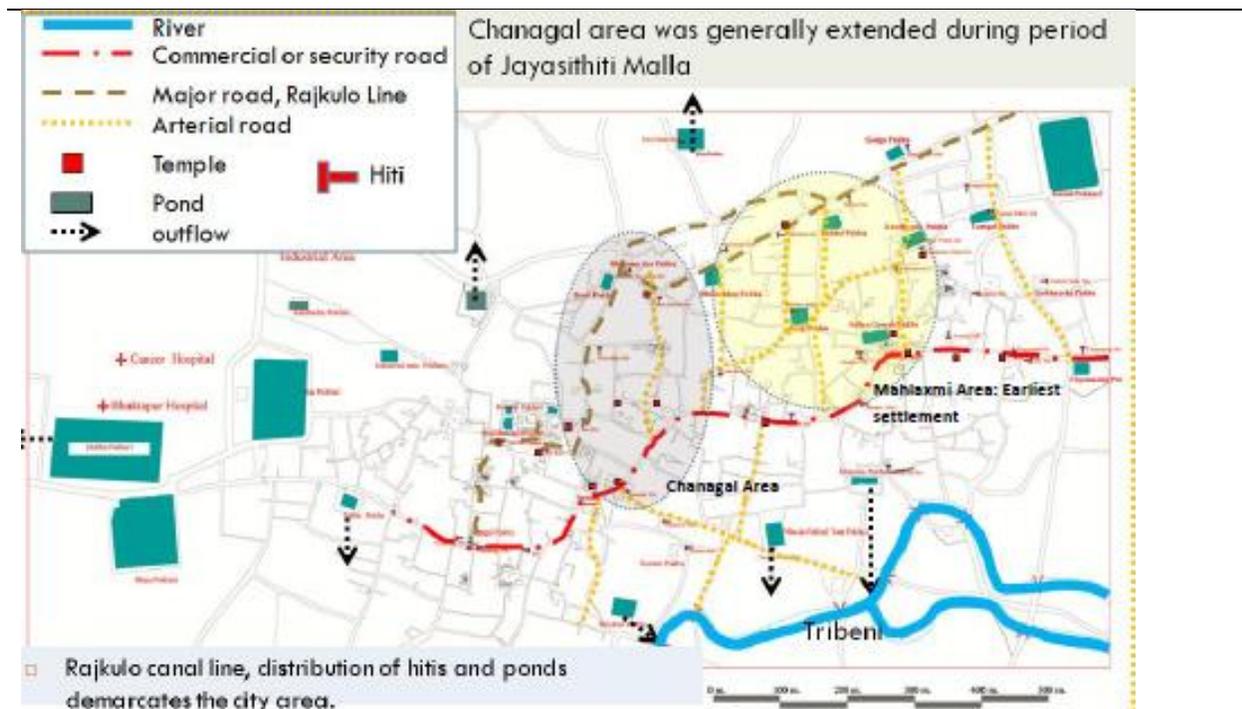

Fig. 3.7 Demarcation of rajkulo and ancient settlements during lichchavi and malla periods

[19]*as per discussion with Dr. Sudarsan Raj Tiwari*

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Cultural heritage of Bajrayogini chariot festival of Sankhu

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Introduction

Located at the foothills of Manichud mountain range, 16 km towards North East of Kathmandu, Sankhu has a unique identity being a typical newari settlement rich in socio cultural environment. With the abundance of clay in those times, houses have been uniformly built of burnt and un-burnt clay bricks. The streets are mostly brick paved and the houses, of rather uniform height seldom exceeding 3 ½ stories, built on either side of the streets have at least the brick walls of the compounds adjoining. Houses are closely spaced and built back to back with only a narrow lane between the two buildings. It has already been listed into Tentative World Heritage Site.

Numerous names can be put forward those represent Sankhu. Among them, Bajrayogini Temple[20] is synonymous to Sankhu. To

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[20] *Bajrayogini Temple is a* Tantrik *temple which is known as* Bodhisattva*'s Temple. The temple is sacred to both Hindus and Buddhists (*Ugra Tara*) which has been built by King* Pratap Malla *in the sixteenth century. The main temple is a three-story high building, which was carefully constructed with the utmost attention and its feature is a red face with three eyes as well as hands, which have the thumb and middle finger carefully, decorated and ornaments surround her statue.*

honoring this goddess, every year Sankhu celebrates Procession of Bajrayogini with Chariots. The procession has special route that passes through core areas of Sankhu, thus inscribing many buildings and places to its procession. Needless to say, Bajrayogini temple and its route got damaged by the earthquake. Even after three years they are yet to be conserved, or saved, if not renovated. The somber reality is that neither of the concerned authorities are showing adequate attention on this aspect. This study intends to explore cultural heritage of Sankhu's Bajrayogini festival with threefold objectives. First, it states the heritage features of traditional settlement of Sankhu. Second, it presents the cultural heritage associated with Bajrayogini Jatra and then elaborates the jatra routes. Third and last, it analyses the impact of earthquake damages before proposing some key recommendations.

This study has been conducted by combining different techniques. Plenty of literatures related to Bajrayogini Jatra has been taken in consideration. Numerous site visits has been conducted, especially for exploration of cultural heritages, rituals and social life. During these visits, situation of tangible and intangibles heritages have been assessed. The local people from different walks of life were interview for study related issues. More than 30 hours of interviews was conducted, recorded and later transcribed accordingly. The depth interview included local politician, conservation activists, journalist, Gurujus, Pujaris, social activist, teachers. Similarly, about 80 people were included in small survey conducted purposively for knowing local people"s awareness on maintenance of Bajrayogini Jatra.

Features of traditional settlements of Sankhu

The old settlement has been planned in gridiron pattern, in the shape of Shankha (conch Shell). Being a historical and old town, still there exist lot of temples, statues, patis, hitis, rajkulos, inscriptions, as well as intangible cultures likely several guthis and 58 festivals. Sankhu is said that it was planned mainly to celebrating Bajrayogini chariot festival. Ashtamatrika Yantra has been used for both the outer settlement consisting of seven peripheral villages forming the ancient Sankhu kingdom as well as the inner settlement of Sankhu town itself.

Sankhu is a parental-home of Goddess Bajrayogini. The bell at Bajrayogini is played at two occasions: once to indicate the started day of jatra and second next is to give signal of some natural disaster. Troup is sent to Bajrayogini temple to invite Bajrayogini into Sankhu during a jatra by playing traditional instruments. This also informs dwellers of Sankhu about rituals to be followed during jatra like prohibition of using leather belt, shoe, jacket, horse riding and taking umberall.

Sankhu is divided into 8 'toles' (neighbourhoods) (Fig. 4.1). For Bajrayogini festival, two toles conduct puja (pray) in Sankhu. Each 'tole' consists of various ethnic groups of 'newari' people. Tamang are also involved in this place.Rajkulo of Sankhu is considered as one of the important historic element which is known as traditional irrigation canal and said that there was no houses without such water canal in the past (Fig. 4.2). Hence it is passed through each 'toles' of the Sankhu. As like as rajkulo, historic ponds also possess dual values like functional as well as cultural values.
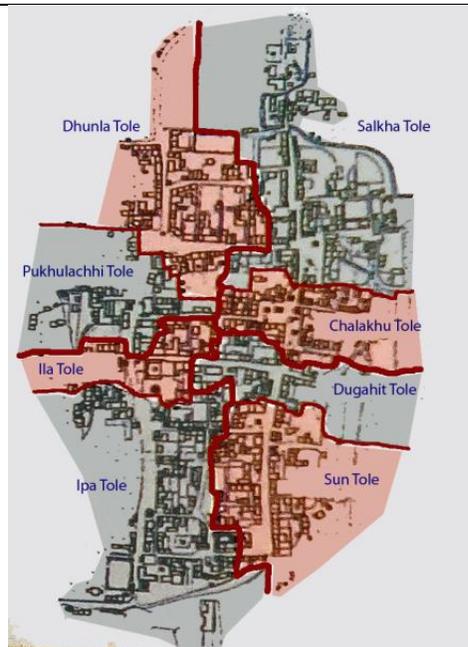
Fig. 4.1 Division of toles (neighbourhoods) in Sankhu

Fig. 4.2 Rajkulo of Sankhu still exist

It is said that there was 8 gates on periphery but some said there were 9 gates on periphery of Sankhu. Among them 5 are still newly constructed in recent decades in their original position. They are still used for different purposes: Dyo Dhwakha (god gate) for procession, Bhau Dhwakha for entering to newly married bride and so on (Table 4.1 and Fig. 4.3).

Table 4.1 Traditional gates of Sankhu and their function

S. No	Gate	Function
1	Dyo Dhwakha	Gate for Lord Bajrayogini during Bajrayogini

		festival
2	Bhau Dhwakha	Gate for entering to newly married bride
3	Mhyaymach Dhwakha	Gate for exiting to the newly married daughter
4	Magh Dhwakha	Gate for entering Mahadev Narayan during Magh Bajrayogini festival
5	Si Dhwakha	Gate to go for funeral purpose which is also known as Mahadev Dhwakha
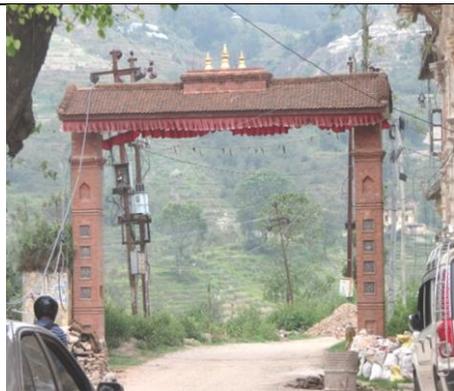
Dya dhwakha

Bhau dhoka

Mhyaymach Dhwakha

Si Dhwakha

Fig. 4.3 Gates to Sankhu's historical core

Heritage of Bajrayogini festival

Bajrayogini Jatra (festival) of Sankhu is symbol of coherence among ethnic groups, metaphor of cultural unity, pillar of religious souls

and a bell that tells history of Nepal.The establishment of Sankhu is inherently links to Bajrayogini. According to the 'Manishail Mahabadan, Swayambhu Puran' the Bajrayogini Jatra dates back to at least 3300 years in the lichchavi period. Nepal's prominent kings/rulers of every era up to Rana regime are directly active on activities of Bajrayogini Jatra. Even today, the Jatra procession of Bajrayogini does not begin until the Maha: who carries Khadga brought from Hanuman Dhoka as Royal representative does not permits to proceed.

It is believed that after Manjushree drained off the Kathmandu valley lake, the first settlement began at Sankhu. All caste found in 'newari' ethnic groups are found in Sankhu. Notably, the Bhaktapur which is believed to develop after decline of power of Sankhu has other castes not found in Sankhu. All castes found in Sankhu participate in Bajrayogini Jatra with various responsibilities. The Bajrayogini Jatra has tied these castes into single thread of unique cultural unity. Vajrayogini patronized the people of Sankhu in different ways. The initiation ceremony of Buddhist 'newar' boy is being held in the premises of the temple. In another occasion, there is a compulsory representation of at least one person in the 'Khat yatra' procession from each house. On this occasion each participant must carry the lamps hands. The procession of the deity is managed by a group named 'Chhewadi.' People show their respect to the deity using the word 'Mai,'mother to address her. It is done to justify the mother status or protector of the inhabitant of Sankhu. Despite her spiritual compliments,the goddess Bajrayogini is also considered as the earthly guide to the people of Sankhu. This is testified by a big bell hung in front of the temple that is rung three times a day. The

inhabitants of Sankhu, therefore, set their time and fix their working period according to the sound of the bell. All these attributes have also been acknowledged by local people. About 36% of the responded considered Bajrayogini Jatra as a cultural heritage of Sankhu whereas another 13% mentioned it as a big festival of Sankhu.

Bajrayogini has many other names too. These various names suggest that the deity Bajrayogini is not uniquely Hindu deity alone. It used to call by the name of 'Guvihar.'Dhanavajra Vajrachary, a prominent historian says the word 'Gu' is originally derived from the Kirati language meaning 'hill with jungle.'On the western side of the present temple of Bajrayogini, there are several rock-cut caves which visualized the ancient shelter for the Buddhist monks, more commonly, used at the time of Barshavyash or could be the religious practicing places for the initiation of the boy into monkhood. One of the caves is carved in a huge stone 1.80 meters high and having two rooms of 1.81x2.18 and 1.5x1.65 meter size respectably. These must be the dwelling place for the meditating person.

This evidence suggests that Sankhu has been an important Buddhist center from the time of the advancement of Buddhism in Nepal. The rock-cut caves of Sankhu presumably indicate the residence of Hinyani monks at the time of the beginning of Christian era.Some ancient types of small Chaityas which are lying about the ground on the eastern edge of Bajrayogini, exhibit the ancient structural fragments of Viharas. According to Manishaila Mahabadan there was an ancient Vihara named "Padmamala" on the hills of Manichuda.The construction of the various Viharas as undertaken when the

Mahasangika tenet in Buddhism was popular in this area. In the eighth century A.D. Padmasambhava, one of the popular spiritual teachers of Buddhist tantra, also visited Sankhu and stayed in the cave with his mudra/ consort.Padmasambhava is still regarded as Guru Rimpoche in Tibet.Consequently, Sankhu was regarded as the important educational center and got popularity at that time in the advancement of Buddhism. Many such Viharas built in different corners of Sankhu town visualized the regular support of the people in the development of Buddhism. Manishaila Mahabadan, however, described nine Viharas as having been built in Sankhu town.Not a single Vihara remains now, except for their locality names being used by local people along with the Buddhist devotees who pay solemn offerings in the full moon day of Shrawan month every year (July – August of English calendar).

Manishaila Mahabadan narrated that there were Siddikula Maha Vihara (Thathu Baha) in Dhunla Tol, Vajrachakra Maha Vihara (Opi Baha) in Sankhu Tol, Gyan Chakra Mahavihara (Yam Bahi) in Durgahiti Tol, Dharmadhatu Maha Vihara (Sui Baha) in Dathunani, Gunakat Mahavihar (Ko Baha) in Sun Tol, Jayanakar Mahavihara (Mansu Baha) in Chalakhu tole, Dharmachakara Mahavihara (Om Baha). In Durgahiti and Henakar Mahavihar (Duchen Baha) in Dathu Chok. Some writers also narrated the name of Padmagiri Dharmadhatu Mahavihara to Yogeswore Baha and Kirtipunya to Guvihara.In this regard, the writers have listed Padmagiri and Kirtipunya names in a single number stating both Viharas were built side by side on the present temple complex of Bajrayogini.

Gellner opined that in the monasteries of Nepal some of the practices have descended from that of the Buddhist Hinayana doctrine (Gellner 1993:221). In this same manner Guvihara of Sankhu has many special traditions reflecting the ancient Therabada Buddhist tradition. The serving priest of Vajrayogini, who functions on rotational basis now, must renounce his family and home throughout the period of worshipping the deity. During this limited period he must stay in house near the temple entirely as a monk, reminiscent of ancient practices of Buddhist monkhood.Moreover, as Gellner inferred, the beating of the wooden gong is an ancient tradition of Buddhist monasteries.Bajrayogini of Sankhu has been following the tradition of beating the log of wood in three times a day, exhibiting more or less the continuity of old tradition.Similarly after Hindus started dominating the Buddhism in Nepal, Bajrayogini has been adopted by Hindus as their own deity. Many Hindu religious activities are conducted in Bajra yogini Jatra. So Bajrayogini Jatra and its route symbolizes importance of religious values too. It is notable that 24% of survey people take Bajrayogini Mai as their savior indicating its religious value.

Bajrayogini Jatra has social importance too. It brings every walks of people around Sankhu together. The 32% respondents of survey takes Bajrayogini Jatra as event that take bring them together. It is able to create strong bonding and harmony between people.

When the Nepal- Tibet trade opened during the time of the lichhavis, Sankhu acquired and important commercial status as a trade route between Nepal and Tibet. From the time of King Amshuvarma, Buddhism penetrated into Tibet through Bhrikuti, a daughter of the

royal family from Nepal. This gave a new form to social and economic relations between the two countries. One inscription at the time of Siva Deva II gives some references about the trade relation in the lichhaviperiod. The route that passed through Sankhu was perhaps the shortest one to Kuti from Kathmandu.The relation was nourished by the rulers throughout the medieval period.

During the late 18th century, the Nepal - Tibet war took place on the ground of trade dispute. Later, a treaty was signed by both the countries in 1789. The second article of the treaty obliged Tibet to pay an annual tribute of 300 dosed to Nepal. According to this treaty, Nepal received a large amount of silver from Tibet imported through the route of Sankhu. This is testified even by the oral tradition narrated by the old peoples of Sankhu. It is also said that the huge bags carrying silver were called 'Toda' made from sheep's leather. The Todas were carried by the people on their backs, and the carriers rested on the pati (resting place) of Inla Tole, Sankhu. These bags were again lifted by the people of Sankhu up to Thali village, that is, west of Sankhu. Thus Sankhu was on the main point of Nepal-Tibet trade, benefiting it economically before the opening of Banepa-Tatopani route. Another aspect of trade through is the trader at that time first used to pray to Bajrayogini before they leave Kathmandu and again arrive at this place. Many temples and Sattals were constructed by those traders.

Establishment of Sankhu town with oracle of deity Bajrayogini is cause of trade through Sankhu. These days, Nepal is trying to penetrate through Himalayas to reach to Tibet for its strategic strength thus promoting trade. One such penetration is planned

through Sankhu, so it has become important place. Another aspect of its economical values can be evaluated by its tourism importance.Many people visit Sankhu mainly at two events via: Bajrayogini Jatra and Salinadi Mela.

Procession of Bajrayogini jatra

Bajrayogini Jatra is one of the oldest Jatra of Nepal. According to Manishail Mahabadan: whole description of genesis of Sankharapur (Sankhu) and Jatra, this Jatra started in 'Kaligat sambat' 1818. Current 'Kaligatsambat' is 5316, so it can be guessed that this Jatra is about 3318 years old. According to Bhasa Vanshawali part 2 and Devmala Vanshawali the establishment of Sankhu differs by 1500 years but they both indicates the settlement established on regime of Shankhardev being same. ManishailMahabadan writes that the Sankhu was established in the 'Kaligat' era 1801.Manishail Mahabadan is chronicles of Vajracharya. The Bajrayogini Jatra started on 'Chaitra Purnima' (Fullmoon day) in the Kaligat era 1818, seventeen years after establishment of Shankharapur. It has continuously conducted for 3300 years except for a year. In the NeaplSambat 794, the king of Kantipur Pratap Malla passed away. Sankhu was under his regime, so in that year, this Jatra could not occur. The kings used to participate actively in this Jatra at that time but during last period of malla regime, then king Jayprakash Mall could not attend Jatra due to blockade imposed by Prithvinarayan Shah during unification campaign. King Jayprakash sent a Khadga as his representative in the year Nepal sambat 850. Since then, khadga is brought from Hanuman Dhoka (old royal palace of Kathmandu) as symbol of king for Jatra.

Major days of jatra

This jatra is celebrated for many days. The first task is 'inviting Bajrayogini Mai.' On the Chaitra Shukla Astami, 4 days prior to Jatra, 5 Thakali Gurjus (priests) and local residents go to Bajrayogini temple to invite the goddess for Jatra. They bring 'gye da' or 20 nuts and NRs. 8.00 for Chaitya and 10 nuts and NRs.8.00 for yellow faced mother or Bajrayogini as invitation. On the same day to inform the beginning of Jatra, 'Nayakhin' is played along paths of Bajrayogini. Through Nayakhin some royal message is also delivered to prohibit: (a) wearing leather shoes, (b) taking umbrella out, (c) to carry construction of new building and repair works of buildings, (d) to hold defaulters by lender, (e) to quarrel, (f) to mount on horse or elephant, (g) to mount in doli, and (h) to disturb on Jatra activities not participating.

About 4 to 5 days prior to Jatra, youths of Sankhu go to the forest of Bajrayogini playing musical instruments and fell dry tree so as to use burning during Jatra from the fourth day. They drag big logs or 'chyakesinh' by tying with ropes and brought to Pahuna Ghar (guest house) of that year.On Chaitra Shukla Dwadashi, Khadga is brought from Hanuman Dhoka as royal representatives. The Khadga is carried along paths of Sankhuan is handed over to local representative or person related to this task. During the Rana Period, the khadga was kept with Dware.

Fig. 4.4 Bajrayogini jatra route

On the first day after 'Nitya puja' (daily worship) by 5 Gurju Thakalis, special 'puja' is done by them again. It is followed by offering of Dresses and ornaments provided by State: Guthi Sansthan.The person who carries Khadga as Royal Representatives orders to carry the sculpture of Bajrayogini or to mount the Sculpture on Khat. While carrying Khat, the khat of Sighini, Bajrayogini, Swayambhu Chaitya and Byagini are placed in order. The Singiniand Byagini is carriers of Bajrayogini. It is believed that while getting down to Sankhu, the Bajrayogini mounts on back of Singhini where as she mounts Byaghini while getting back to its temple after visiting Sankhu (Fig. 4.5).
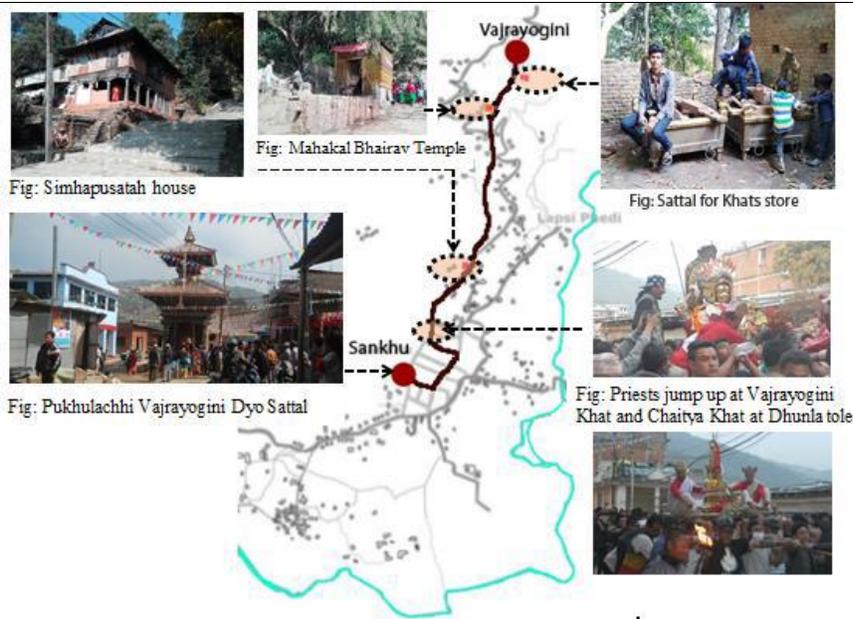
Fig. 4.5 First day of Bajrayogini jatra in Sankhu

While carrying Khats to Sankhu, at a place named Swalla, near to DhullaTole, 4 Gurus get up to Khat of Bajra Yogini and 2 Gurus get up to khat of Chaitya. This procession is known as 'Bare Thahawanegu'. At the same place the deities are offered Silver Eyes provided by State, it's known as mikhakane or opening eye ceremony. These Gurus carry cap symbolized of Pancha Buddha. The task of these Gurus is taking care of Sculpture and entertains pula offered by disciples. When the khat procession enters to Sankhu, these khats are kept in side PahunaGhar (Guest House). Actually there are 4 such houses where the khats are kept at one place a year. This year this occasion is carried out at Inllatole. Other PahunaGhar are at Dhulla, Chalakhu, Inlla and Suntole.

From Second day to eight day, bathing of deities are done by carrying holy water from stream 'Takki' near Shalinadi River. The second day of Jatra is known as 'Shunyaka.' In newari, it means rest or peace. On this day people of Sankhu carry cleaning, bathing and

washing like purifying activities. People also manages necessary items/grains for 'Nakha' (festival). The third day is known as Nakha: or feast day. People of Sankhu organize feast on happy occasion of Bajrayogini Jatra on this day. Animal Sacrifices are made at Mahankal Bhairav, just beneath on the way to Bajrayogini Temple. People also invite their guests from Sankhu for feast from this day. The fourth day is the main day of jatra. On this day, after nitya puja, mul puja or main puja is done (Fig. 4.6). Mulpuja follows the offering of dresses and ornaments provided by state once again.Then all deities are mounted on their respective khats and brought for roaming around city of Sankhu.

Fig: Goddess Basundhara
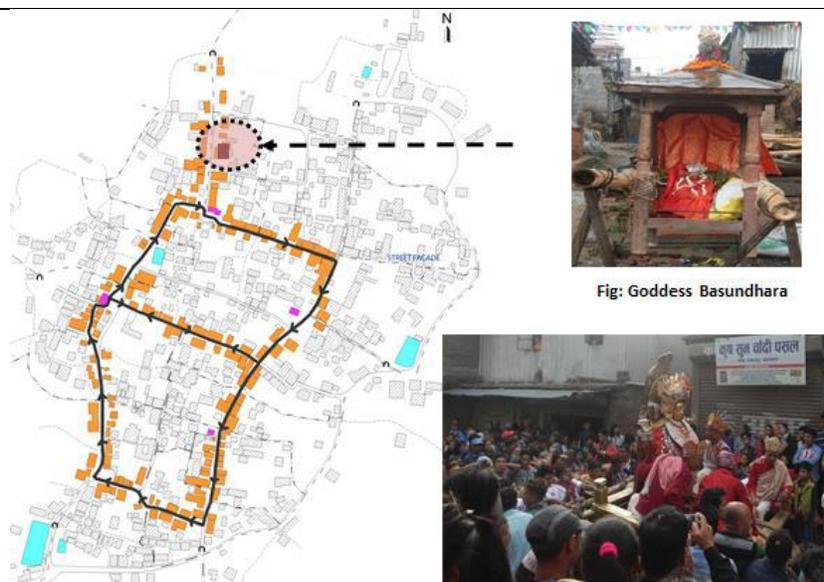
Fig. 4.6 Bajrayogi jatra on the fourth day in Sankhu

On this day, goddess Basundhara is also introduced in Jatra for procession. Actually, there are 3 sculptures of Basundhara in Sankhu, one remain at premises of Bajrayogini Temple, one with Gurus which is displayed during occasion of Pancha Dan and one for this occasion. There is ritual of not to put sculpture of Basundhara

on ground, so Khat in which Basundhara is kept above ground by holding khat by wooden pillars while resting. After this procession, the khats are brought back to PahunaGhar. When khats arrive to PahunaGhar, the sculptures of deities are kept outside Pahunaghar so that people of Sankhu can see and worship them. Dhuni or burning of logs brought from Bajra Yogini Jungle is lit which is continued till eighth day of jatra without going off till deities are mounted back to khat for returning procession. On this day, people of Sankhu invite their friends, guest from outside Sankhu for Jatra and taking Prashad of Bajrayogini. On this day, near Kumaritole of Inlatole, ceremony of offering Mari Kashi or basket of Sweets occurs.

Mu: Vujya is performed on fifth day of Jatra. According to ManishailMahabadan, People of Sankhu got permission to establish 'Kuti' or rice grinding machine to prepare rice from paddy from Bajra Yogini. In return, then King Shankarapur and its citizens offered special puja to Bajrayogini playing musical instruments around city. The scriptures notify this event started from KaligatSambat 1819. One controversy raises this event. It raises the question that on first year of Jatra whether there was procession of 7 days only. During day time, to satisfy unknown souls, Bhut, Pret, a puja known as 'JogiChakkar' is offered with Egg, duck, goat and buffalo. This Jogichakkar is again conducted on fifth day as well. Old people inform that such JogiChakkar used to conduct on Sixth day of Jatra at Taleju Temple too. To perform JogiChakkar, a KanPhatta or Jogi with torn Ear are employed. Khat procession is not conducted from Salkhatole until JogiChakkar is performed. 'Jogi Chakkar' is performed on the sixth day. Besides, ceremony of Dhun-Bijya is done. The seventh day is known as Bauya. On this day, 'bhut and

pret' souls are offered feast in mid-night at different 'toles' of Sankhu. On this day, any one from outside can enter Sankhu but no one can go outside Sankhu. If someone goes outside Sankhu for some purpose, they should return to Sankhu before night. On the eight day of the Jatra, Gurujuspeform Home offering all the grains, fruits available in this creation. The deities are mounted back to Khats then khats are carried back to Bajrayogini Temple which is known as 'Thanhabijya' or Climing back.


Fig. 4.7 Bajrayogi jatra on the eighth day in Sankhu

On the ninth day when jatra procession arrives to 'Swalla' near Dunlatole, the Gurujus sitting inside respective Khats jump back to ground which is known as 'Bare Kwobiyaigu.' On this day at Kolagaal which is little bit toward Bajrayogini Temple from Sankhu, Khats are moved forth and back by carriers as if it symbolizes the happiness of deities.After completion of all procession of Jatra, Bicha puja or 'take care' puja on behalf of king on eleventh day and similar puja on

behalf of Queen on twelfth day is organized at Bajrayogini temple. On this day, all people of Sankhu offer puja and organize feast at the temple premises. On the fourth day from Bicha puja, the khaga: representative of King is taken to all parts of Sankhu and then brought back to Hanuman Dhoka Durbar.

There are four 'sattal' (community house) to conduct Bajrayogini festival at Sankhu (Fig. 4.8).They are name as: (a) Dhunla Dyo Sattal, (b) Chalakhu Dyo Sattal, (c) Ila Dyo Sattal and (d) Suntole Dyo Sattal.
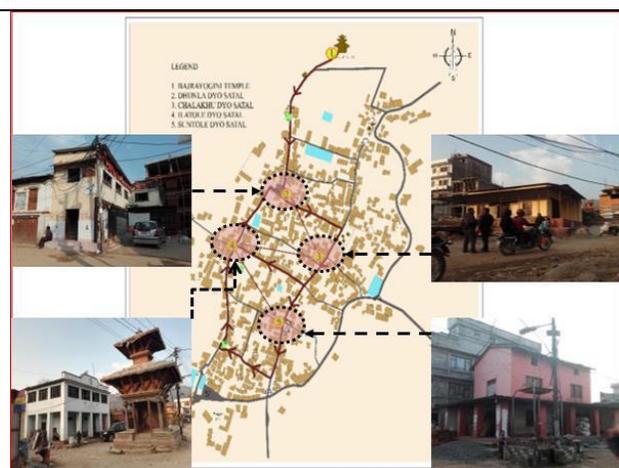

Fig. 4.8 Four Sattals at four sides in Sankhu

Damagesof Bajrayogini jatra route

For simplicity, the Jatra route of Bajrayogini has been divided into 9 parts indicated as follows (Table 4.2).

Table 4.2 Area divided for assessing damages of Bajrayogini jatra route

Area 1-2	from Dyo Dhoka to Dhunlatole	Area 5-6	from Suntole to Ipatole	
Area 2-3	from Dhunlatole to Salkha tole	Area 6-7	from Ipatole to Inlatole	
Area 3-4	from Salkha tole to Chalakhu tole	Area 7-8	from Inlatole to Pukhulachhichowk	
Area 4-5	from Chalakhu tole to Dugahittole	Area 8-2	from Pukhulachhitole to Dhunlatole	
Area 5-6	from Dugahittole to Suntole	Area 4-7	from Chalakhu tole to Inlatole	

Legend
1. Bajrayogini Temple
2. Dhunla Dyo Sattal
3. Chalakhu Dyo Sattal
4. Ila-tole Dyo Sattal
5. Sun-tole Dyo Sattal
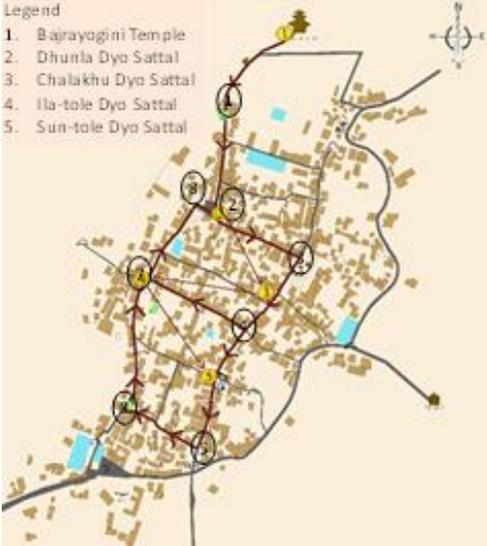
There were only constructed 48 number of new houses among 277 number of houses which lies along Bajrayogini jatra route at Sankhu. The situation of repair is very slow in private buildings too. Field visit found less buildings damaged or collapsed have been reconstructed. The number of reconstructed buildings along the jatra route is given below (Table 4.3).

Table 4.3 Situation of damage of private building along Jatra route

Area	Collapsed	Damaged	Repairable	Reconstructed Houses	% of house reconstructed
1_2	2	14	7	1	50.0
2_3	14	9	1	6	42.9
3_4	7	15	3	3	42.9
4_5	9	23	4	4	44.4
5_6	14	8	0	5	35.7
6_7	9	16	2	0	0.0
7_8	12	6	3	3	25.0
8_2	2	1	1	1	50.0
4_7	8	7	3	2	25.0
Total	77	99	24	25	

Conclusion and key recommendations

The cultural heritage of Bajrayogini jatra route needs to be conserved especially after the earthquake. As it is not only associated with physical structure but also related with communities in the form of intangible heritage. Isolation renovation and reconstruction of individual structure does not help to conserve the heritage. Hence, the reconstruction approach must take consideration on both aspects in a holistic way.

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Developing Jadibuti as an Urban Node of Three Districts

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Introduction

Jadibuti area, is an urban node connecting Bhaktapur (Thimi), Kathmandu (Koteshwor) and Lalitpur (Tikathali) at a point. The one and only urban node connecting all three largest cities of Kathmandu valley is unfortunately ignored disturbing everyone passing this part of the capital through Araniko Highway. This Highway linking Kathmandu to Bhaktapur has one of the highest traffic volume. According to JICA Quarterly Newsletter (2011), 50,000 vehicles ply the road per day whereas according to The Kathmandu Post (2011) it is 80,000 vehicles per day. Newly built Highway together with high mobility has caused increase of land prices in the vicinity and neighbouring areas: NRs 12.4 million per ropani in Thimi and NRs 9.85 million per ropani in Bhaktapur.The Manohara River located in the northeast part Jadibuti area has been polluted due to sewer line connection and solid waste disposal. Excavation of sediment sand thereby causing riverbank erosion has been continuously unabated. Some part of water's edges have also been occupied by squatter settlements. The Jadibuti area also lies along the flight path of Tribhuvan International Airport located on northern side. This paper

explores the possibility of developing 'Jadibuti area' as an urban node through analysis of area's strengths, weaknesses, opportunities and threats.

Surrounding wards of Jadibuti area

To understand the surrounding areas of proposed site the wards of Kathmandu Metropolitan City (KMC) and Madhyapur Thimi Municipality (MTM) adjacent to the site are studied. Ward 32 of KMC includes the Koteshwor and Pepsicola areas. It is bounded by Manohara River in the east, Bagmati in the west, ward no. 9 (KMC) and Goththatar VDC in the north and Lalitpur district in the south. It encompasses 395 hectares of land and has a population of 35184. The main industrial activities of the area are sand, gravel, slate and marble depots. Futsal arena, a small football ground, Pushpanjali cinema hall and pool houses are the means of entertainment.

Kathmandu 2020 has it has included an educational policy to have at least a primary school in place with population of 5000. To compare above data and the standard of Kathmandu 2020 there is double number of primary schools in the area but it also shows that primary school is a most necessary part of any neighbourhoods.The number of health centers, polyclinic dispensaries is in excess of the required number of such institutions for the given population as per Kathmandu 2020. Moreover, most of the hospitals are located in the proximity of the proposed site. There are three squatter settlements in the ward, along the river banks of Manohara River. They are detrimental to the urban beauty of the area and will therefore have to be displaced from their current locations. They could be

accommodated in the low-cost houses being built by the GoN in Ichangu Narayan VDC in the western part of Kathmandu Valley.

The area has a high number of vehicle repair workshops owing to its proximity to the highway. Similarly, there are numerous hardware shops to cater to the ever-growing urbanization of the area. Small food and tea shops as well as clothes shops are also abundant which cater to the low-income population that lives on rent. There are, however, no high-end shopping centers and eateries in the area which has limited the economic activity in the area. Also, the previously existing vegetable market at Koteshwor has been displaced by the expansion of the Ring Road. Therefore, a vegetable market is needed where the local produce from Thimi and Bhaktapur can be traded.

Kathmandu municipality, in its official website, has listed the following 5 biggest problems of this particular ward:
1. *Drinking water*
2. *Sewerage and Drainage*
3. *Roads*
4. *Ambiguity regarding the land of the Department of Civil Aviation*
5. *Telecommunication*

Drinking water, sewerage and roads are not a new problem for Nepal. The ambiguity regarding the land of the Department of Civil Aviation is also a problem in this ward. There are many old buildings in the ward which are in violation of the OLS rule of ICAO.

Ward 16 of Madhyapur Thimi Municipality (MTM) includes the Lokanthali area. It is bounded by Manohara River in the north and west, Hanumante River in the south, ward nos. 15 and 17 (MTM) in the east. It lies in the district of Bhaktapur and has a total population of 4788.Most of the land in this ward is used for agricultural purposes, mostly for growing vegetables for consumption in the local markets. The ownership pattern of the houses/housing units in the municipality indicates that urban activity is in a premature phase because only a very small number of the houses/housing units are used for non-residential purposes. The total unemployment rate of the ward, at 4.15% is almost double the national average of 2.1%.

Transformation of Jadibuti area

The rapid change in Jadibuti node over the passage of time can be seen by comparing the satellite images taken at different times. In 1967, there was a lack of general infrastructures like road networks and built forms in the Jadibuti area (Fig. 5.1). Both sides of the Manohara River were surrounded byfarmlands with almost no built forms .Less than 5% of the area was covered by built forms. The area around the Jadibuti node had no road passing through it and neither was there a bridge over the Manohara River. The main road, an old trade route, passed through the airport straight towards the town of old Thimi.

By 2012, the built forms had increased dramatically to cover almost 59% of the area. Large swathes of agricultural lands had been divided into small plots and used for construction of residential buildings. A compact settlement can be seen with a sharp decline in

open spaces. This rapid growth was largely driven by people displaced from their homes due to the Maoist's Peoples' War. The changes were most prominent in the Pepsicola, Lokanthali and Naharephant areas. The land pooling project, initiated in 2003 had also been implemented at the southern sideof Araniko Highway along the Manohara River. Squatter settlements started appearing on the either banks of Manohara River to the north of the highway from 2007 AD .Another major change seen in the area was the widening of the Araniko highway to four lanes. Slate depots had also been established on both sides of highway. The green environment of the past has been hugely degraded with increase in buildings and other built forms.
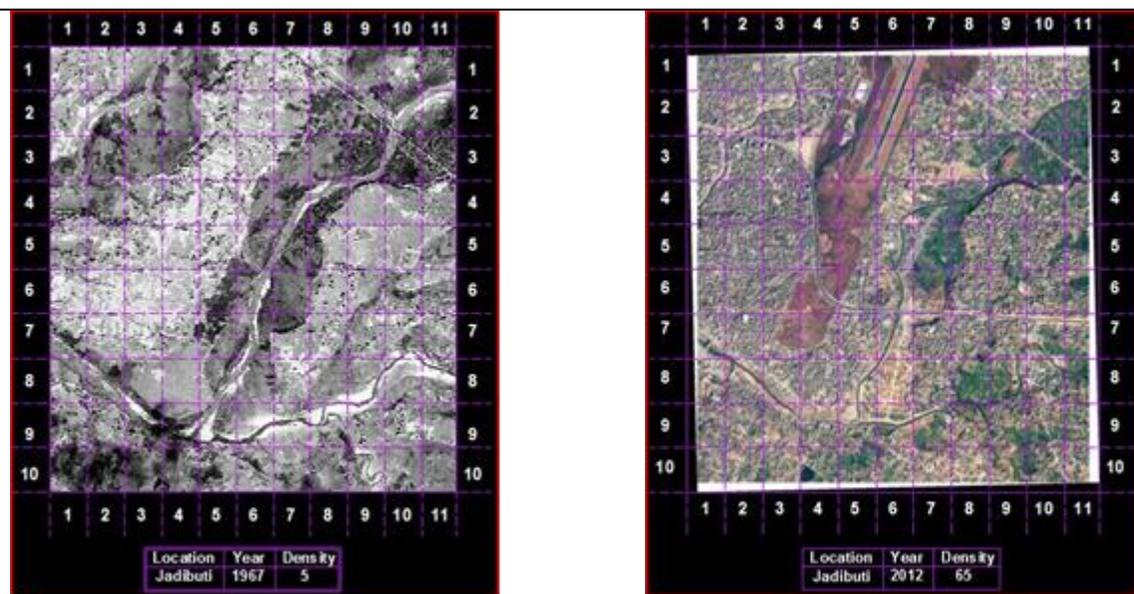
Historical development of Jadibuti node in 1967   *Historical development of Jadibuti node in 2012*

Fig. 5.1 Transformation of Jadibuti area between 1967 and 2012

The data of building permits issued by the five municipalities in the Kathmandu Valley (Kathmandu, Kirtipur, Lalitpur, Bhaktapur and Madhyapur Thimi) from FY 2064/65 to FY 2068/69BS shows that

the average permits issued per year in these municipalities during this period is about 5,711. The building permit issued by the Kathmandu Metropolitan City (KMC) was 63.5% of the total during this period. However, the trend of building permit issuance shows a sustained negative trend since FY 2066/67. Ward 32 has the highest numbers of building permits issue rate within KMC during this period.

Streetscape and riverscape

Jadibuti area isoccupied by slate depots on either side of the highway, squatter settlements and dumping along the river banks with residential and commercial buildings along the major roads. The Manohara Riverand the Araniko Highway are the greatest contributors for urban growth in the area.

There is lack of proper infrastructure and open spaces (only 0.001% of the total area has been set aside for recreational purposes). The Government has been turning a deaf ear towards allocating proper recreational areas. This area seems to have potential for development of recreational spaces and commercial centers with basic facilities.

Lokanthali-Jadibuti chowk stretch

Jadibuti chowk- Lokanthali stretch

Fig. 5.2 Streetscape and riverscape from Jadibuti area

Manohara land pooling

One of the major development projects going on in and around the Jadibuti are is the land pooling project. The project is one of the several land pooling projects initiated by the Kathmandu Metropolitan City authorities with the aim of promoting planned urbanization of the Kathmandu and counter the haphazard development that has been ongoing in the city.The Manohara Land Pooling Project was initiated in 2003 and incorporates the land on either bank of the Manohara River. Land price in the area increased by about four times after implementation of this project. Land price before land pooling project: was 3-5 lakh per anna whereas land price after land pooling project has increased to 15-18 lakh per anna.

| View of Land Pooling Area | Master Plan of Manohara Land Pooling Project |

Fig. 5.3 Master plan of land pooling area

The land pooling project aims to promote the area as a residential zone. However, due to the presence of the Araniko Highway which runs right through the middle of the project area, it has a great potential for development as a commercial hub. The lack of a commercial hub in the area around Jadibuti and its location at the confluence of three districts of Bhaktapur, Kathmandu and Lalitpur makes it an ideal location for the development of a commercial hub.

Building Bylaws

Kathmandu building by laws has given strict instructions for river areas and highway right-of-way. 25m setback from the edge and 50m setback from the center of the highway has to be provided while designing any built forms along the highway. Similarly, there should be 20m setback from the river bank along the Manohara River. South-West side of the site is categorized as an urban and commercial sub zone at south east side of the site.

Summary of SWOT analysis

SWOT analysis is done to understand negative as well as positive aspects of the site. All the strengths, weaknesses, opportunities and threats observed at the site are listed below.

Strengths:

1. *Good road network; good road linkage with highway*
2. *Main transit point between Kathmandu and Bhaktapur; gateway to Bhaktapur*
3. *The Manohara river*
4. *Landmarks like Puspanjali Cinema Hall and Jadibuti Complex.*
5. *Presence of large swathes of open land*
6. *Strategic location of prominent views i.e. Visual permeability area*

Weaknesses:

1. *Valuable land along the river bank are neglected due to flood risk*
2. *Lack of policy towards proper river management system*
3. *Exploitation of the unique river environment and its setting*
4. *No bridge connects two parallel lands along the river except the highway bridge.*
5. *Lack of pedestrian safety – no proper footpath*
6. *Lack of proper infrastructure*
7. *Lack of commercial and business centers, office facility, greeneries, open spaces, etc.*
8. *Squatter settlement.*

9. *Slate depots and dumping area occupy land very close to the highway.*

10.   *Lack of new designs and developments*

Opportunities:

1. *Natural riverfront conservation with green belts*
2. *Provision of additional informal access opportunities on to the river at appropriate location*
3. *Increase land and property value around that area*
4. *Can improve infrastructure development*
5. *Can increase commercial activities*
6. *Can create city image by developing new technology designs*
7. *Riverfront development along Manohara river*

Threats:

1. *Flood and its disaster*
2. *Squatter settlements*
3. *River pollution/ sewage disposal*
4. *Lack of urban design guidelines to manage and regulate urban growth in the study area*
5. *Slums and squatter settlement creating unpleasant views in the study area*
6. *Lack of awareness and physical matters, destruction of the natural green areas*

Conclusion

For the development of node as image of the city, the existing services and facilities are to be upgraded and new developmental features are to be introduced.Unmanaged Squatter settlement along

the river, Vehicular workshop and slate depots etc. needs to be developed as commercial and recreational potential of the site.Lack of managed public open space can be addressed by creating public open space inter connecting rivers, river belts, plazas and parks with built forms.

Renu Maharjan is a practicing architect has finished her post graduate in Sociology and completed her masters in Urban Design and Conservation in 2015. Besides her regular architecture practice she has also taught students of architecture of Khwopa engineering college at Bhaktapur. She has worked as a lecturer in IEC, a school of art and fashion at Kathmandu.

Social Sustainability of Temporary Shelters: A Case of Bungamati and Sakhu

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Freelance architect
Email: julishapradhan1@gmail.com

Introduction

The Gorkha Earthquake of 25[th]April, 2015 of 7.8 magnitude followed by May 12 aftershock of 7.3 magnitude has adversely affected 31 districts of Nepal causing huge losses of lives and properties. Bungamati was severely affected by these recent earthquakes with 851 houses out of the 1,351 houses completely collapsed; 315 partially damaged; and the famous Buddhist temple of the 'Machhindranath' was completely destroyed. 7 people lost their lives and 40 people were injured. Sankhu also witnessed similar type of destruction.

Many people are forced to live in temporary shelter[21] built for short period living only. However, in the case of Nepal, they have been living in such condition for the last three years. This study intends to find out the condition of earthquake victims living in temporary shelters of two traditional settlements namely Bungamati and Sankhu, heavily damaged by the earthquake. The physical, social and environmental aspects of their shelter and living condition are

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[21]*A simple tent or a public mass shelter used for a few weeks following a disaster constitutes a temporary shelter (Quarantelli, 1991, Wu and Lindell, 2004, Johnson et al., 2006, Johnson, 2007 a, Johnson, 2007b, Félix et al., 2013a).*

explored in detail through site visit, questionnaire survey and consultation with the concerned stakeholders.

Study area

Bungamati and Sankhu endowed with many historical and cultural heritages are important parts of the broader civilization of Kathmandu valley. Both sites, emulates a unique a combination of original settlement dweller sand traditional living environment. The rich cultural assets, historic architecture, exceptional Newari craftsmanship and diverse intangible heritage make Sankhu and Bugamati exemplary historical settlements to look into.

Bungamati, a satellite town of Lalipur lies in Lalitpur Metropolitan City. It is 10 km away from Kathmandu and around 6 km distance from Lalitpur (Fig. 6.1). It is surrounded by different rivers and streams from all four directions: Bhorle kulo on the north, Kholsa on the south, Nakhu Khola on the east and Bagmati River on the west. Sankhu famous for its Sankha shaped (Conch Shell) town structure is the ancient town of Newar community located in the foothills of Shivapuri range. It is one of the oldest settlements situated 17 km northeast of Kathmandu on the bank of Salinadi River.

In both locations, earthquake victims are living in temporary shelters built after the earthquake. In Bungamati, earthquake victims occupying 'Chohel Nani' (major courtyard) and town periphery near existing Bus Park are selected (Fig. 6.1). In the case of Sankhu, people living in peripheral areas and in the agriculture filed near Sali River are selected for the study.

| Bungamati sites | Sankhu sites |

**Fig. 6.1 Location of study sites in Bungamati and Sankhu**

Conditions of people living in temporary shelters in Bungamati and Sakhu

Physical aspect

The temporary shelters in Chohel nani (courtyard) in Bungamati are mostly made of light structures, bamboo, corrugated galvanized iron (CGI) sheets and bamboos with mud plaster (Fig. 6.2). The shelters in outer periphery of Bungamati was constructed of wood and CGI sheet and in agricultural fields the shelters are constructed of CGI sheet and bamboo. Some of the shelters had 2 rooms also which were made by wood.
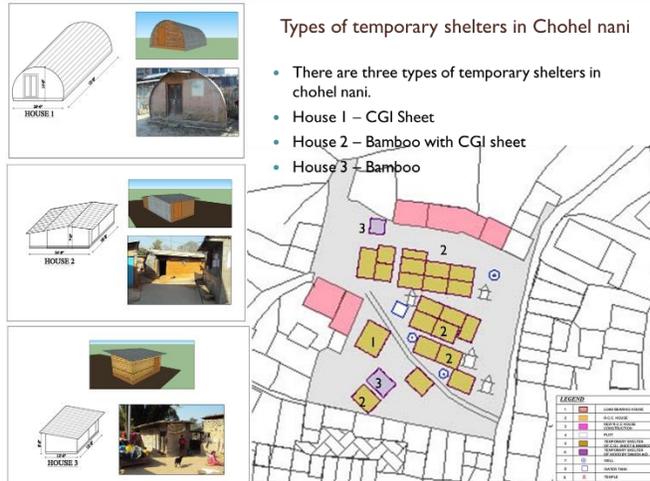
Type of temporary structure at Chohel Nani
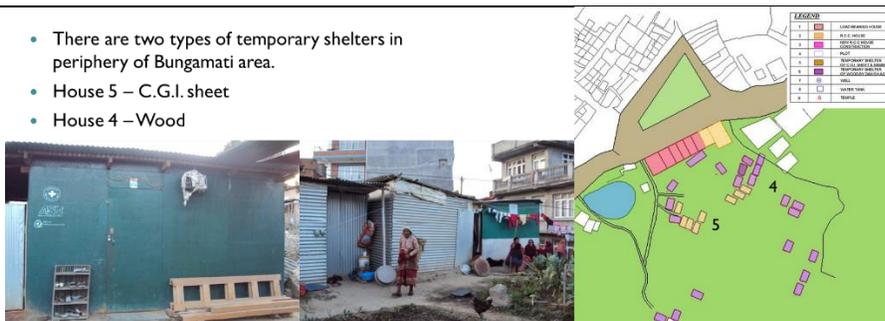
Type of temporary structure near bus park

Fig. 6.2 Use of different materials for temporary shelter construction

There are around 20 families living in temporary shelter in this courtyard. The temporary shelters are of different types with maximum 7' height and minimum 10'x12' area. The shelters consists of door and single room mostly with roof of CGI sheet in one way slope, two way slope and semi-circular. There are small windows 2'x2' for ventilation and a door. The shelters in outer periphery of Bungamati made mostly of wood which was constructed by Danish aid and CGI sheet (Fig. 6.2).

Temporary shelters in the outer periphery and agriculture field of Sakhu are constructed of CGI sheet and bamboo (Fig. 6.3). Some of the shelters had 2 rooms also which were made by wood.

The shelters at the agricultural fields in Sankhu are also constructed of CGI sheet and bamboo with a minimum area of 10'x12' and ventilation of 2'x2' and a door which has only single room.


- Temporary shelters in periphery of Sakhu area.
- House 5 – C.G.I. sheet
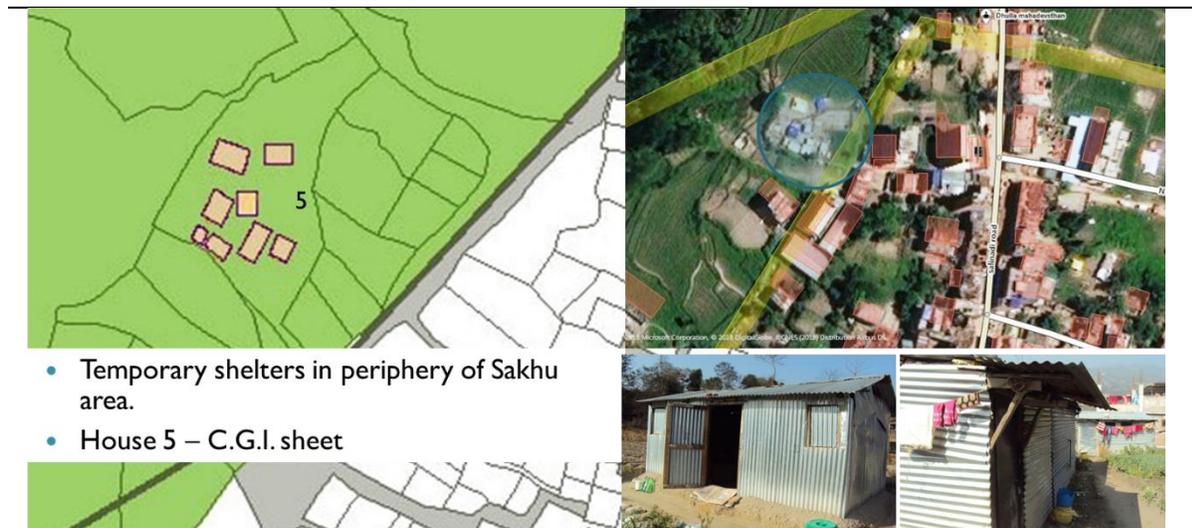
Type of temporary shelter in town peripheral area in Sankhu

- Temporary shelters in agricultural field of Sakhu area.
- House 5 – CGI sheet
- House 3 – Bamboo

Type of temporary shelter in agriculture field in Sankhu

Fig. 6.3 Use of different materials for construction of temporary shelters in Sankhu

In both cases, they are living in insufficient spaces of a single or maximum of two rooms (Fig. 6.4). A single room has been used for multiple activities: living, cooking, studying, storing and sleeping including

socialization with relatives in some occasions. Walls are beings used to hang cloths and utensils. As a result, those who are residing in the courtyard in Bungamati and town peripheral areas in Bungamati and Sanku, they are forced to occupy their damaged houses at least for using toilets and cooking purposes.
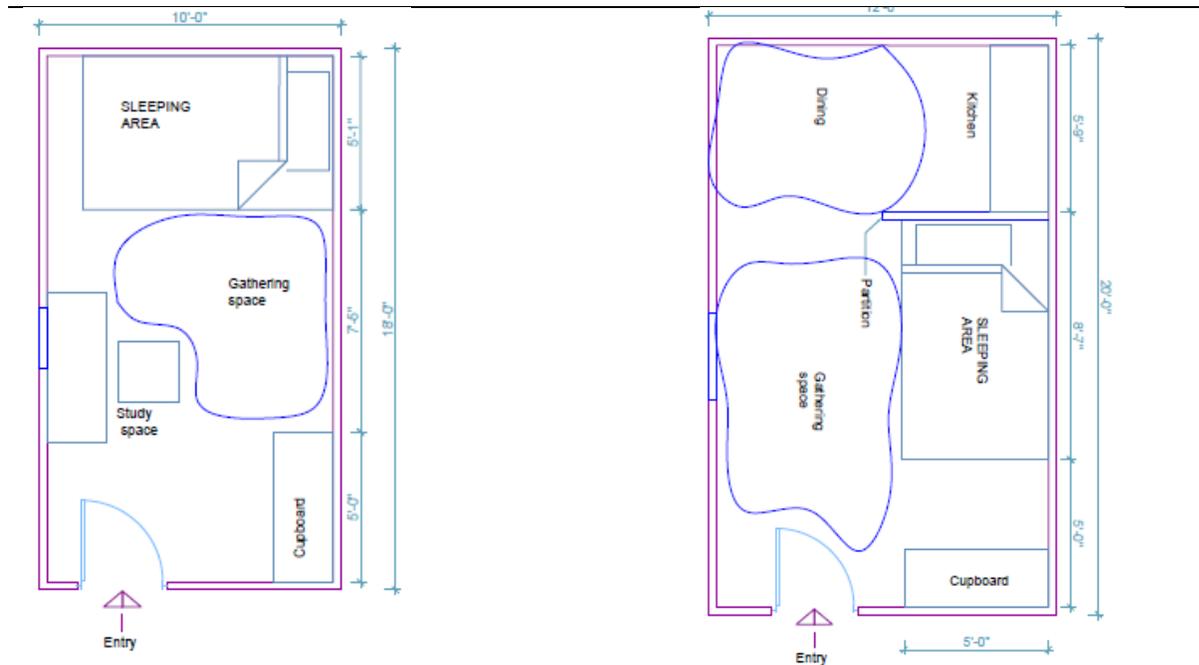
| Layout of a temporary shelter at Chohel Nani in Bungamati | Layout of a temporary shelter with half partition in agriculture field of Sankhu |

| Using the damaged house for hanging clothes | Single room with all activities |

Fig. 6.4 Insufficient spaces in temporary shelters and use of damaged houses

Social aspect

The community of Chohel Nani is a mixture of castes (Bajracharya; Mali, Mahajan, Tuladhar and Shakya) with most residents working in agriculture and wood craft. Along with their farming activities, many residents have secondary occupations such as weaving tailoring and cooking. While a select number work in the construction industry (e.g. Structural engineers) at the local school and in local government. Community spirit is rich in Chohel Nani. It is common to see residents sitting together, helping each other with daily chores, sharing agricultural harvesting tasks and socializing in large groups.

Compare to the residents of temporary shelters living in agriculture fields, victims staying in the temporary shelters in courtyards have some benefits. They have easy access to retail shops, health posts and schools besides having electricity and water (common water tanks) and common toilets. They have been able to use their damaged houses at least for taking bath, using toilets, storing water and cooking foods. They are staying in groups and neighbours are nearby so they feel secured. Such facilities are not available for those living in agriculture field. They feel insecure at night and have problems for using toilets. No electricity and water facility are available for them in the temporary shelter site.

Residents living in courtyard are following rituals, traditions and gatherings since they have damaged house as an alternative and they are living in a community and near to the house of relatives and neighbours. Residents in agriculture field and outer periphery are

following rituals less than residents of courtyard since they have lack of space and economy.

As the courtyard is being occupied by temporary shelters, numerous activities (daily and rituals) in the post-earthquake period have been hampered. Due to construction of individual houses, some part of the courtyard are also being occupied by construction materials.

Health and hygiene

Health and hygiene is crucial dimension for assessing living condition of victims living in different temporary shelters in various locations. Unhygienic environment causes different diseases such as diarrhoea, cholera and dysentery whereas cold weather results in body ache, joints pain and asthma. Air pollution causes respiratory diseases and poor neighbourhood causes mental and psychological problems.

The questionnaire survey reveals that the most affected victims are those living in agriculture filed in Sankhu (Table 6.1). Out of nine households, eight of them responded that their family members have problems of body and joints pains, fevers in the past three years and they also feel loneliness during daytime. Similarly, seven households responded that their family members suffered diarrhea, typhoid, and cholera in the past. Such diseases can be correlated with living conditions without toilets, water and electricity. Similarly, those living in periphery of core areas both in Bungamati and Sankhu have faced health problems all associated with unhygienic condition and poor living spaces.

Table 6.1 Health issues due to poor built environment and inadequate facilities

S.N.	Causes	Diseases	Bungamati		Sankhu	
			Chohel Nani (9 household)	Periphery of core (4 households)	Agriculture filed (9 households)	Periphery of core (6 households)
1	Insufficient water and sanitation facilities	Diarrhea, typhoid, cholera, dysentery	4	3	7	4
2	Temporary construction material	Body ache and joints pain due to cold, fever	8	3	8	5
3	Smoke and insufficient ventilation	Respiratory diseases such as bronchitis, asthma	2	2	5	3
4	Poor neighborhoods	Loneliness, hypertension, etc.	5	4	8	4

In all cases one thing is common. Majority of them living in all locations have felt body and joint paints, suffered from cold mainly due to temporary nature of building materials. They have to fight with dampness from the ground below. Those who are staying in wooden shelter are comparatively better compared to other shelters built with bamboos and CGI sheets. Those who are staying in shelter built with CGI have suffered the most. During sunny day, it's very hot and humid inside the room. In rainy season, the noise from rain and hurricane disturb them a lot. Also, there is no adequate light and ventilation inside the shelter in all cases.

Economic aspect

Majority of the population in Bungamati and Sakhu are dependent on agriculture for their livelihood. Besides agriculture, people are involved in nonfarm activities like spinning, knitting, carpentry/wood carving, handicrafts, retail shops and carpet weaving. However, these earthquake victims have been suffered in family income too. First, their working production for agriculture products have been decreased as the earlier joint family was forced to live in different places. Due to lack of spaces, they could not perform their works fully in the state of pre-earthquake period. Second, agriculture lands have been occupied by temporary shelters thereby reducing the agriculture products. Third, due to their inability to rebuild new houses, psychologically they are not fully enthusiastic to work as before the earthquake. Their main concern is how to rebuild their damaged houses at the earliest possible.

Cultural aspect

Bungamati and Sakhu are traditional 'newari' settlements in which different culture and traditions are followed. Machendra nath jatra (chariot procession) in Bungamati and Bajrayogin jatra in Sanky are famous. To celebrate these festivals, people from different communities must join to perform various activities allocated them. However, those communities living in temporary shelters could not fully participate in such festivals. They have also reduced inviting their relatives and celebrating various ritual mainly due to lack of spaces and their tensions of inability to rebuild their damaged houses. Those living in the courtyard of Chohel Nani comparatively participate in religious and ritual works more than those living in peripheral core area and agriculture fields. In some cases, they

simply perform 'puja' (worship) and without inviting their relatives and neighbours. It is getting harder for them to follow the traditions in the small and insufficient space spending money when it is getting harder for them in daily living.

Conclusion and recommendations

The residents in temporary shelters are living in poor condition and are vulnerable to various diseases and psychological tension. They have been adjusting in an unhygienic spaces (built for living few days only) for the last three years. Those living in agriculture fields are worse, deprive of basic facilities. Their situation just after the earthquake was comparatively better as many agencies used to visit them and provide various supports. Such supports are not available at present.

Their living condition need to be improved through provision of basic facilities such as water, electricity and toilet. For that the responsible agencies mainly National Reconstruction Authority and local government must come up with some practical solution to deal with them.

Ms. Julisha Pradhan received B. Arch degree from Kathmandu Engineering College in 2012. She recently graduated Master of Science in Urban Design and Conservation from Khwopa Engineering College, Bhaktapur, Nepal. Before joining the college, she had worked at various organizations as an architect designing different types of buildings and interior decoration. Her field of interest includes urban design and conservation focusing social issues.
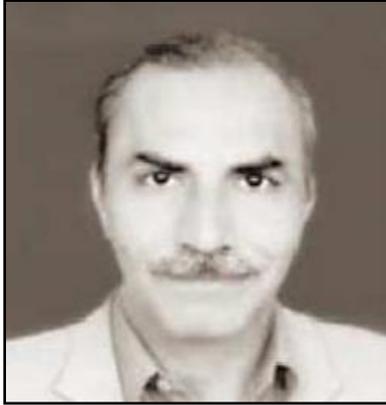
Letter from the Chairman's Desk
By Sunil Bhatia PhD

Did 'crime and punishment' exist from the primitive times? Evolution is resting on love and as hatred surface disturbs the course. It is nature's law that animals are food for one other and it is natural for killing but elements of hatred is missing. It might be possible that in some cases self defence might have led to attack others. As humans started living in cave for protection from vagaries of weather and placing heavy stones at the entrance that very moment they understood the limitation of enemies that their mental state as well physical strength would not allow to displace this stone before attack. Later on they designed clothes for protection for better survival. These protection ideas led to understand the limitation of others and thought 'Why should I be isolated out of fear of attack let the attacker and they devised various techniques of controlling by tying the legs of animals or placed under cage etc...' and these practices might have turned to concept of punishment. It is my opinion that cruelty element was added with modern concept after development of society.

In primitive times, everyone whosoever was living fighting for survival and concept of wrong and right was not in their minds. In modern time we call 'jungle rules' where survival was only matter. No one was protecting and it was individual fight for survival. Nature was not kind and every living being faced the problem that the

crucial parts for continuation of life were in one end of the body whether it was human where neck and above or snake or dinosaur or other animals and their struggle was focused on save neck and above from their respective enemies and devised the way to attack for neck for other for food. Nature allowed mastering everyone with one unique feature that proved tool for safety as well for attack like deer could run faster but lion was with strength for killing. As long animals exploited that specific features bound to survive and as failed proved victim. How did humans come to aware that attack the weakest part for killing and simultaneously worked for improvement of strength for overpowering other living for food? 'A journey of devising techniques for killing enemies from slow to instant death expressed respect for one another and proved real dynamo for progress of mankind but progress has inbuilt character of selfishness and real ugly face surfaces when attacks the body parts of enemies for killing with unbearable pain for slow tourtures death for deliberate enjoyment or for some objectives.

Human journey for safety as well as attack begun with physical strength as a tool but at what point they realized inner capabilities were not sufficient for safety and drifted for external means is still mystery. Animals or plants relied on their inner strength and still continue live on mercy of others where humans crossed that threshold of fear of others and used the same for own benefits .It is strange that animals genetically carried that fear in next generations. A newly born rat baby of few moments has never seen the cat but if places hair of cat close its defence mechanisms comes into action. Humans learnt the art of acquiring knowledge not only through genes but other means and designed for passing information. That simple step proved stepping stone for next

generations and helped in progress as well mastering in controlling others by understanding their respective weaknesses. Animal's child learning is limited to survival and in short time attains maturity where human's child learns the survival under protection but lives beyond through acquired knowledge and it takes longer time for mature .At one point in human journey they realized the sense of security with the stone or metals tools or knowledge of fire management and if anyone tried to breach that confidence circle punished attackers by instilling fear or other known techniques for allowing for running away or controlling or ultimately by eliminating .

Nature's limitation helped in designing various tools like for capital punishment was performed by using rope by placing around neck and allow breaking instantly with jerk for death. As technology improved they used stones for killing and knowledge of fire and metal completely changed the face of punishment and no more rely on hitting for bleeding rather focusing on instant killing. Knowledge of chemical helped in designing such products that was beyond imagination of others. Design of butchery was based on concept of attacking the vital parts with sharp edge for quick death what our ancestors did in primitive times for killing. Design of cage for controlling wild animals was concept for safety but later on the same concept was applied for designing jails for punishing humans.

Design of punishment came into existence with social concept that too for safety and correction course for controlling the further damage or not to invite unwanted troubles. It started with physical hitting either with hand or sticks or twisting the limited movement beyond its capacity as we do in arm twisting for pain or break or twisting neck is for making non existence. With discovery of fire and

knowledge of chemical changed the face of crime as well punishment. In modern times, people torture by placing heated metal rod over body for burning or throwing acid on face or stabs many times with knife. We have witnessed use of mustard gas in Second World War for mass killing. Common salt or red chilli for placing over wound was one kind of torture and later on used for fast disposal of dead body that is still in practise. Woman uses pepper spray in self defence for torturing the eyes of attackers for turning to temporary blind. Even insertion of sharp hard item in body creates pain and sometime it proves fatal. 'How come idea of miniaturization strike in their mind but it proved significant role in modern time. In medicine, the design of injection needle for curing where pain was one kind of punishment improved to such level it is almost vanished and avoid bleeding by keeping disinfected cotton is example for protection out of punishment. Attempt of miniaturization is modern concept in surgery.

Every animals in defence uses bite because of teeth or secretion of unwanted liquid like urine or venom from the body to make others unconscious for diversion technique to slip out of the catch or use of nails for inflicting pain for run away from the grip. These practises are still visible in human behaviour for getting time by diversion the attention for running away from the grip.

Thrashing is extension of concept of punishment for segregating edibles. Where person was unable to climb for fruits they devised techniques of hitting with stones is punishment. Bridle or nose ring in ox or horse is one kind of punishment for inflicting pain for allows them to move in direction driver wishes. Use of whip for inflicting pain was another kind of punishment for directing for performing specific tasks. There are group of people who are sensitive for

animals and pressed demands that no harm should give to animals for shooting of entertaining films or test of any cosmetics by manufacturers that has harmful chemicals applied on animals before marketing for humans . I have witnessed in my life the bullock that was with huge wheel made of iron and pulled heavy loads. Indian parliament passed the bill that iron wheel should be replaced with tyre and rubber and neck of the animal should not have horizontal weight more than 10 kilograms. These small efforts forced our designers work for better design for cart and results are welcome.

Once I have noticed in elevator where it was about to move with full designed capacity and suddenly a few person wished to board and there was warning sign appeared overloaded and that person felt bad and under social pressure got down for not to delay other boarded passengers. Design of warning was nothing but not to punish the designated machine. Similarly where heavy traffics are expected and for free entrance as well exit and not punish anyone for waiting let others move we designed the door that has mechanism for opening in both way otherwise we use the door it should open in one way. That opening of door in both direction inward as well outward for convenient movement for exit as well entry for avoid punishing any person not to wait. A person standing in queue waiting for his turn for specific job is to be done by designated authority for maintaining social fabric intact is crime of wasting their productive times and standing in queue is punishment. That forced the authority to think for better faster solution was reason of switch over from manual to computer or artificial intelligence for improving customer experiences.

Concept of universal design has come into the existence where certain class of society of certain reason fail to take the advantage of

benefits of products and services because it is taxing their body parts and it is taken as social punishment of no reason of their faults. It is the next level of social sensitivity. In old age physical strength and uncontrollable movement of hands does not permit of even opening of cap of bottle simply by lifting or by twisting and it is one kind of punishment. When I looked at bank functioning and struggle of old man in filling the withdrawal form or use of ATM I consider it is one kind of punishment.

Why people punish their bodies by artificial intoxication for stimulation? Why does society allow the people for consuming liquor or hard drugs for punishing their physical as well mental state? Is it not social crime? Humans are so cruel that they did not spare animals for exploiting by castrating bullock for making docile for changing to ox. In large section of population on the earth still practices inhuman act for female genital mutilation believing it lowers the libido. How does the idea of punishment strike to our ancestors? Is it natural that initially punish by pricking with unaccepted social relations that is treated as abuse and later on switch to physical assault or ultimate with tools for killing.

Cruelty surfaces as and when sensitivity diminishes so nature of punishment and crime. Many times we heard in news where murderer stabbed many times the dead person out of hatred or frustration for extreme nature of punishment. Hiroshima could have captured by allied forces but that option was overruled because it would have taken long time to capture but desire for early celebration of victory or lesson by mass punishment of the extreme level never witnessed in history forced for dropping the bombs and result was genes were mutated and many generations were effected

with the outcome of bomb. Was not crime by allied forces and the way they punish not beyond imagination of mankind?

Primitive people witnessed crime by physical assault but modern time seems to appear more dangerous where punishment nature in many layers and added psychological dimension also. We pretend to be more sophisticated and civilized but under the skin we are still under influence of jungle rules covered with invisible tools of harassment for others. Eve teasing or stalking or even staring or hanging undergarments in open for drying or showing private parts in public is treated as disturbing the privacy of others and there is framed law for punishment. Disturbing privacy by writing letter or posting mails or making phone calls considered crimes and invite punishments. To protect the interest of specific tribes we designed soldiers who punish their body for training to meet any eventualities of enemies. Modern technology of mobile phones has helped us in progress but it has punished our birds who navigates with earth magnetic waves and electromagnetic waves interference failing in locating their destinations. Even modern woman wishes to present herself in artistic way by punishing her body by plucking her unwanted hairs of face. When we tie our shoe laces we punish our foot for larger interest of protection. Shoe bite is punishment for user and it is because of result of bad design. Punishment is subset of learning.

Some people are sadist and enjoy by punishing other by giving pain. Similarly certain people lives with the feeling that they are not part of progressive system or no more useful for society intellectually or physically in failing in getting proper job at to be engage at physical level for living left with no option but punish their body sexually for earnings. It is sad that oldest profession is prostitution in the world

and certain group of people abduct the childs and punish their bodies in psychological as well at physical level their minds deranged and turned to prostitution as profession. Even those who are well off in any means wishes to control others by turning into slave by punishing by tying hands or legs with rope or handcuff or chained their legs and as it was limited to animals we call domestication but it took ugly turned when same concept was applied on humans for making as slave . a few have revolted and were killed by system. Industrial revolution brought new face of slavery and mill owners punishes the workers bodies with optimum from sun rise to sun set at meagre salary for maximizing their profits. A new work forced emerged for transportation by manually pulling the tri rickshaw and where ever it was not available used horse cart and instead of horse man placed for pulling manually. Is it not crime where man was puling along with   Religion also did the same harm by inducting people for running their organization by making unattractive by not allowing to wear a normal worldly person dresses and design in such a way it should cover all possible attractive body parts and if someone wishes to do so faces severe punishment. I am surprise to notice the condom with dotted on external surface gives what pleasure to person but it expresses mentality of punishing by torturing because woman inner parts are so sensitive , movement of person act as file creates injuries and even bleed. Is it not punishment for woman to enjoy sex with person wearing dotted condom?

I am thankful to Dr. Bijaya Shestha for accepting our invitation for Guest Editor and I admire his sincerity commitment and honouring his word in best of his ability and hard work that is reflecting in his selection of articles for meeting international standard. No country is

small and I admire the people who are working for contribution for making world better and it is my request for readers that do not never evaluate any country by its size but human index and respect its sovereignty and value by contribution for making world better. Nepal is the country working hard without compromising values for respecting individual sensitivity.

LAMBERT Academic Publishing has published book "Design For All, Drivers of Design" author Dr. Sunil Bhatia of Design For All Institute of India and it is available on www.morebooks.de one of the largest online bookstores. Here's the link to it:

https://www.morebooks.de/store/gb/book/design-for-all/isbn/978-613-9-83306-1

This book is dedicated to our esteem readers, contributors and well wishers.

With Regards

Dr. Sunil Bhatia

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Forthcoming Issues

October 2018 Vol-13 No-10

Dr. Sugandh Malhotra has over sixteen years professional experience in industrial design and automotive styling industry. He has worked on design projects for marquees in the industry that include Honda R&D, Hero Global Design, Hi-Tech Robotic Systemz Ltd., SETI Labs Berkley, Aprilia Motors Italy, Bombardier Canada and most of the leading automotive and consumer brands of India. He has been instrumental in design of over 18 techno-commercially successful launched products at a pan India level. He has won many International and National level design awards. Dr. Malhotra takes keen interest in teaching design and has been mentoring students from many leading institutions such as IIT Delhi, IIT Roorkee, SPA Delhi, Lady Irving College, IILM, Pearl Academy among others. Currently, he is working as an Assistant Professor and the Coordinator of MVD program in IDC School of Design at IIT Bombay. His research interest areas include design research methods, future design possibilities, trend research and design forecasting and intelligent mobility systems.

November 2018 Vol-13 No-11

Asst. Professor Yasmeen Abid Maan (Associate MIAP, MPCATP) PhD Scholar (College of Art & Design, University of The Punjab) M-Phil (Arch), University of The Punjab, B Arch (UET, Lahore) has accepted our invitation for Guest Editor.

Special November 2018 Vol-13 No-11

Gaurab Das Mahapatra
M.Plan (M U R P Gold Medallist, SPA Bhopal); B. Arch Assistant Professor, Gitam (Deemed to be University)

Gaurab Das Mahapatra is an Architect-Planner presently working as Assistant Professor in Gitam School of Architecture, GITAM (Deemed to be University), Visakhapatnam Campus. Architect Mahapatra had received the prestigious DIC (Design Innovation Centre) scholarship for research in Universal Design from Centre for Human Centric Research in SPA, Bhopal under the guidance of Prof. Dr. Rachna Khare, who herself is a pioneer in the Indian Universal Design scenario.

December 2018 Vol-13 No-12

Robert Nichols , an Owner of Nichols Design Associates, Inc., Washington, DC has been extensive experience in Architectural Design and Universal Design for over 35 years. His expertise within this area of specialty includes building surveys and ADA Accessibility checklist for the public and private clients. He is President and Chairman of the Board of World Deaf Architecture, Inc. (WDA), a new knowledge group of American Institute of Architects (AIA), since a non-profit organization was established in 2016. Received B.Arch. & M. Arch. degrees in Urban Design under the leadership of Prof. Colin Rowe from Cornell University will be our Guest Editor.

February 2019 Vol-14 No-2

Architect Kavita Murugkar, an associate professor at the Dr B N college of Architecture in Pune, graduated in 1998 from the Pune University, and completed her Masters in Archaeology from the Deccan College Deemed University, Pune in 2006. With over a decade of teaching experience, Kavita is recognized as a passionate educator and an active researcher and has handled various academic and administrative responsibilities as a faculty and course coordinator successfully ever since she joined BNCA as full time faculty in 2006.Her academic interests and expertise lie in research and

constant innovation in subjects like basic design, architectural design, history of architecture and architectural project. Her professional work experience majorly consists of residential and corporate interior architecture projects. She also has heritage related projects to her credit including the listing and documentation of all heritage buildings in Pune for the PMC and INTACH. Kavita has emerged as a strong proponent of Universal Design formerly identified as Barrier free architecture and has set up a Research and Training Centre for Universal Design at BNCA for promoting people centric and inclusive design education and practice. Her work on the subject of Universal Design has been recognized at State and National level. She is empanelled as an Accessibility Expert and Access Auditor by the Ministry of Social Justice and Empowerment and the Department for Empowerment of People with Disabilities. She is the first architect recipient of the AVISHKAR AWARD for best research project at the State level Inter-university research competition in 2012. She has also received the NCPEDP-MPHASIS UNIVERSAL DESIGN AWARD 2014, for the work done to promote accessibility and Universal Design in the built environment. She has been felicitated by the Indian Institute of Architects, Pune Centre and the Maharashtra association of Schools of Architecture with the Best Teacher's Award 2014 for her outstanding contribution to architectural education. She has also received the A3 Foundation Teachers Award 2016 at Chandigarh for her work in the field of architectural education. She has been invited by prestigious institutions like National Institute of Design (NID), School of Planning and Architecture (SPA, Bhopal) as expert jury and for conducting courses on Universal Design Thinking.

New Books

Sunil Bhatia

Design for All

Drivers of Design

Expression of gratitude to unknown, unsung, unacknowledged, unnoticed and selfless millions of heroes who have contributed immensely in making our society worth living, their design of comb, kite, fireworks, glass, mirror even thread concept have revolutionized the thought process of human minds and prepared blueprint of future. Modern people may take for granted but its beyond imagination the hardships and how these innovative ideas could strike their minds. Discovery of fire was possible because of its presence in nature but management of fire through manmade designs was a significant attempt of thinking beyond survival and no doubt this contributed in establishing our supremacy over other living beings. Somewhere in journey of progress we lost the legacy of ancestors in shaping minds of future generations and completely ignored their philosophy and established a society that was beyond their imagination. I picked up such drivers that have contributed in our progress and continue guiding but we failed to recognize its role and functions. Even tears, confusion in designing products was marvelous attempt and design of ladder and many more helped in sustainable, inclusive growth.

www.lap-publishing.com

it is available on **www.morebooks.de** one of the largest online bookstores. Here's the link to it: **https://www.morebooks.de/store/gb/book/design-for-all/isbn/978-613-9-83306-1**

The Ultimate Resource for Aging in Place With Dignity and Grace!
Are you looking for housing options that are safer and more accommodating for independently aging in place? Do you want to enjoy comfort, accessibility, safety and peace of mind – despite your disabilities, limitations and health challenges? The help you need is available in the Universal Design Toolkit: Time-saving ideas, resources, solutions,and guidance for making homes accessible.

This is the ultimate resource for individuals and professionals who want to save time, money and energy when designing, building, remodeling or downsizing a home. The Universal Design Toolkit will help you take the steps to design homes for your clients or yourself while eliminating the costly trial and error challenges you'd inevitably encounter if faced with this learning curve on your own.

Rosemarie Rossetti, Ph.D., teamed with her husband Mark Leder in creating this unique Toolkit. They bring ten years of research, design and building expertise by serving as the general contractors for their home, the Universal Design Living Laboratory– which is the highest rated universal design home in North America.

Within the Toolkit's 200 richly illustrated pages, you'll find:

Insights that distinguish *essential* products, services and resources from the *unnecessary*.
Proven, realistic tips for finding the right home.
Home features you need to look for. Nothing is assumed or left out.
Handy home checklists and assessments.
Interview questions to help you hire industry professionals with knowledge and experience.
Photographs that provide a frame of reference to inspire, clarify and illuminate features andbenefits.
Valuable resources to save you time, money and energy.
Helpful sources of funding.
Space planning dimensions for access using assistive devices such as wheelchairs andwalkers.
And so much more!

If you want useful, dependable advice and easy to implement ideas from respected experts who know the ropes, you'll love Rossetti and Leder's perspective. As a speaker, author and consultant who uses a wheelchair, Rossetti has helped hundreds of people design their ideal homes. Now her comprehensive Toolkit is available to help and support you!

Get the Universal Design Toolkit now to start your project!

Disability, Rights Monitoring and Social Change:

DISABILITY,
RIGHTS MONITORING,
AND SOCIAL CHANGE
Building Power out of Evidence

Edited by
Marcia H. Rioux,
Paula C. Pinto,
and Gillian Parekh

New Update: ELIVIO BONOLLO (2015/16) PRODUCT DESIGN: A COURSE IN FIRST PRINCIPLES

Available as a paperback (320 pages), in black and white and full colour versions (book reviewed in Design and Technology Education: An International Journal 17.3, and on amazon.com).

The 2018, eBook edition is available in mobi (Kindle) and ePub (iBook) file versions on the amazonand other worldwide networks; includingon the following websites:

ePub version:
www.booktopia.com.au
https://www.booktopia.com.au/ebooks/product-design-elivio-bonollo/prod9781784562946.html

mobi (Kindle versions):
www.amazon.in
https://www.amazon.in/Product-Design-Course-First-Principles-ebook/dp/B07FNV2F4L/ref=sr_1_1?ie=UTF8&qid=1532999395&sr=8-1&keywords=Product+Design%3A+A+course+in+first+principles

www.amazon.com
http://www.amazon.com/Product-Design-course-first-principles/dp/1784562939/ref=sr_1_sc_1?ie=UTF8&qid=1456434322&sr=8-1-spell&keywords=Bonollo+Product+Design%3A+A+course+infirst+principles

www.amazon.com.au
https://www.amazon.com.au/Product-Design-Course-First-Principles-ebook/dp/B07FNV2F4L/ref=sr_1_fkmr0_1?ie=UTF8&qid=1532497383&sr=8-1-fkmr0&keywords=Product+Design+a+course+in+first+principles

READING HINTS: ePub files can be read with the iBook app on Apple MacBook/iPad devices; ePub files can also be read on Desktops PCs, Laptops and Surface devices using readers such as the Microsoft *freda* ePub reader. The Kindle (mobi file) reader isflexible and suitable for reading the eBook on PCs; Kobo readers can also be used to read ePub files on MacBook and iPad. All formats are very interactive with very good navigation.

TAPPING INTO
HIDDEN
HUMAN CAPITAL

How Leading Global Companies Improve their
Bottom Line by Employing Persons with Disabilities

DIS ABILITY

DEBRA RUH
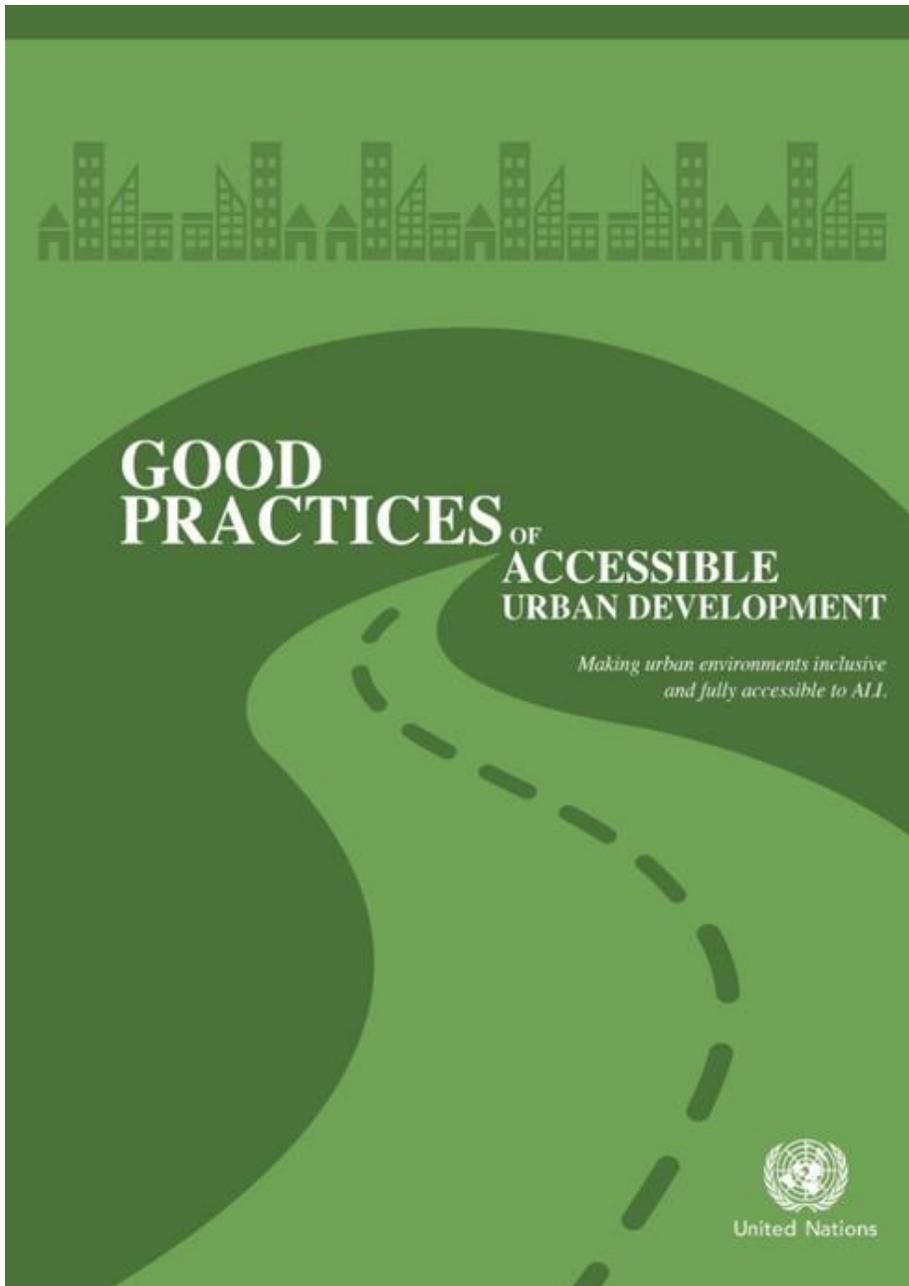
In light of the forthcoming United Nations Conference on Housing and Sustainable Urban Development (HABITAT III) and the imminent launch of the New Urban Agenda, DESA in collaboration with the Essl Foundation (Zero Project) and others have prepared a new publication entitled: "Good practices of accessible urban development". The publication provides case studies of innovative practices and policies in housing and built environments, as well as transportation, public spaces and public services, including information and communication technology (ICT) based services.

The publication concludes with strategies and innovations for promoting accessible urban development.

The advance unedited text is available

at:**http://www.un.org/disabilities/documents/desa/good_practices_urban_dev.pdf**

Dr Chih-Chun Chen and Dr Nathan Crilly of the Cambridge University Engineering Design Centre Design Practice Group have released a free, downloadable book, _A Primer on the Design and Science of Complex Systems_. This project is funded by the UK Engineering and Physical Sciences Research Council (EP/K008196/1). The book is available at URL:

http://complexityprimer.eng.cam.ac.uk

Changing Paradigms: Designing for a Sustainable Future

New iBook / ebook:
HOW TO DO ECODESIGN

ECODESIGN HANDBOOK

HOW TO DO ECODESIGN

PRACTICAL GUIDE FOR ECODESIGN – INCLUDING TOOLBOX

ISSUED BY THE GERMAN FEDERAL ENVIRONMENT AGENCY

Authors:
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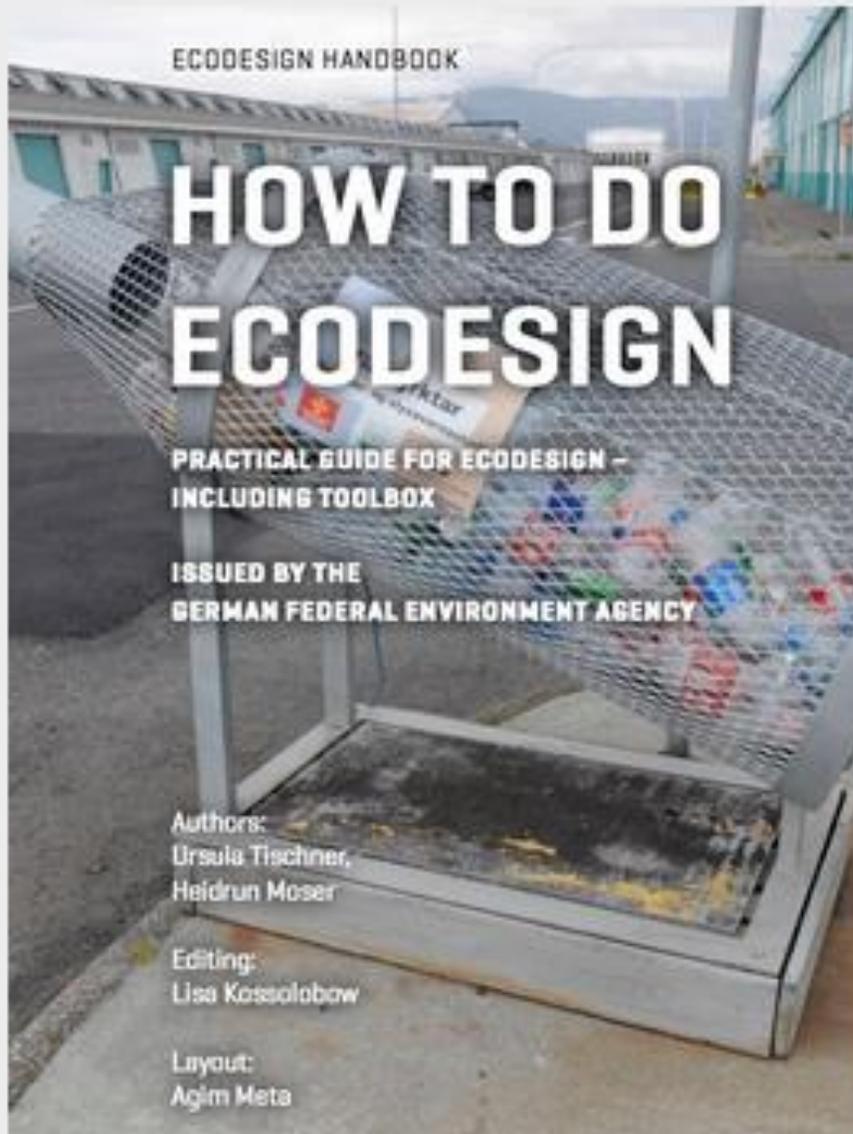
Practical Guide for Ecodesign – Including a Toolbox
Author: Ursula Tischner
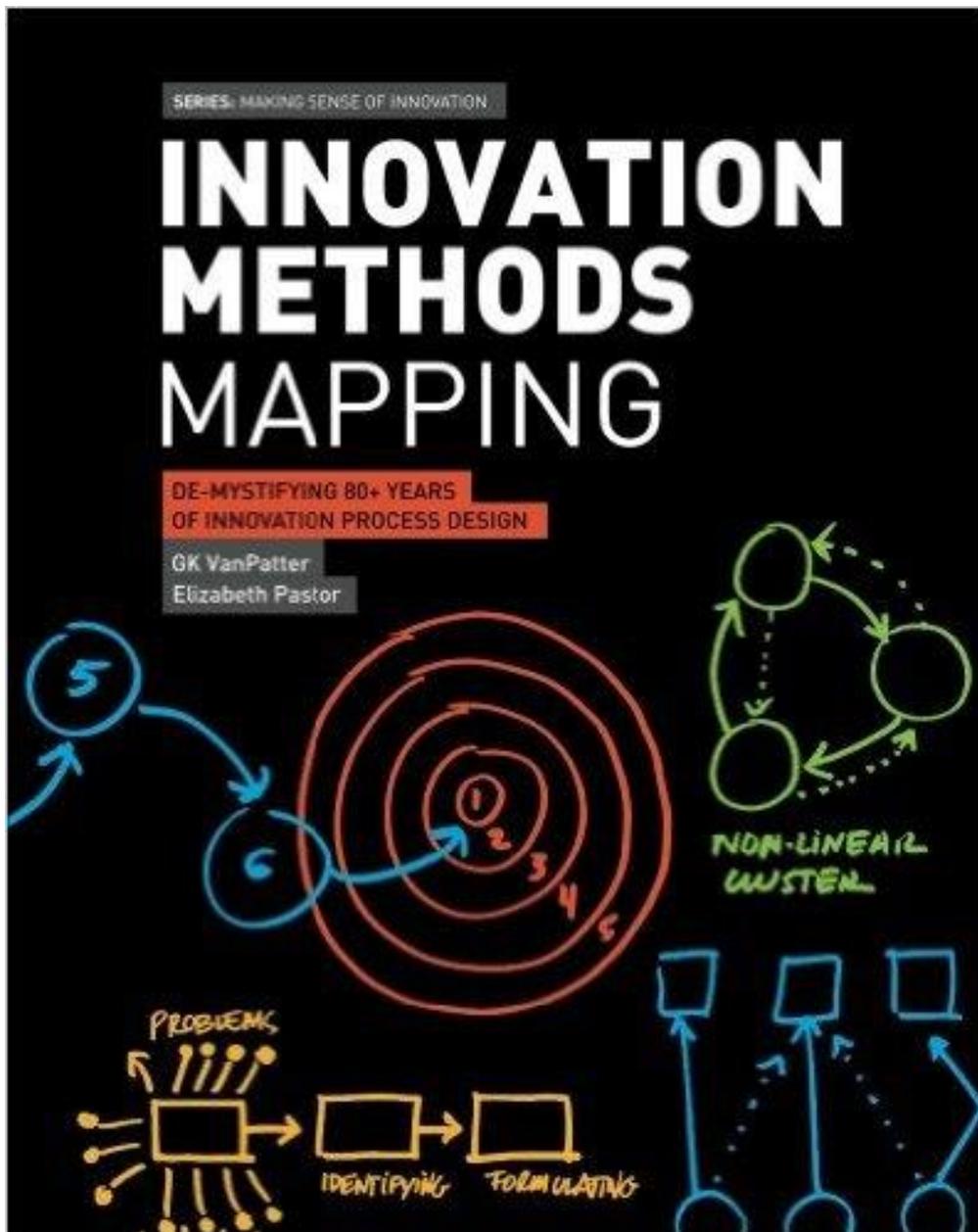
Humantific's new book: Innovation Methods Mapping has just been published and is now available on Amazon.
https://www.amazon.com/dp/1540788849/ref=sr_1_1?ie=UTF8&qid=1482329576&sr=8-1&keywords=Humantific
You can see the preview here:
https://issuu.com/humantific/docs/innovation_methods_mapping_book_pre

Pre-book form

Thank you for your interest in the book, 'The Design Journey of Prof. Sudhakar Nadkarni'. Few limited copies will be available for purchase on the day of IDC Alumni Meet, on June 11th, Sunday, 5:30 to 6:30 pm. Rest of the book orders will start shipping June 25th, 2017 onward.

* Required
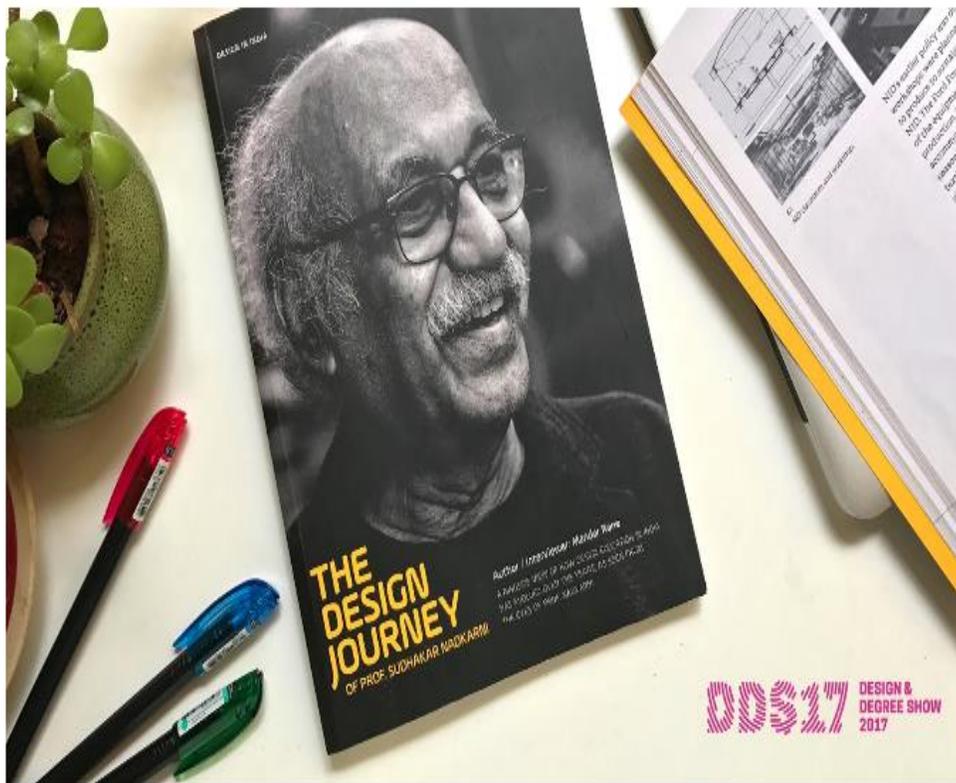
How many copies of the book do you wish to buy? *

Arnar Árnason and Sigurjón Baldur Hafsteinsson

DEATH AND GOVERNMENTALITY

Neo-liberalism, grief and the nation form

Universal Design: The HUMBLES Method for User-Centred Business

**FRANCESC ARAGALL
AND JORDI MONTANA**

Universal Design
The HUMBLES Method
for User-Centred Business
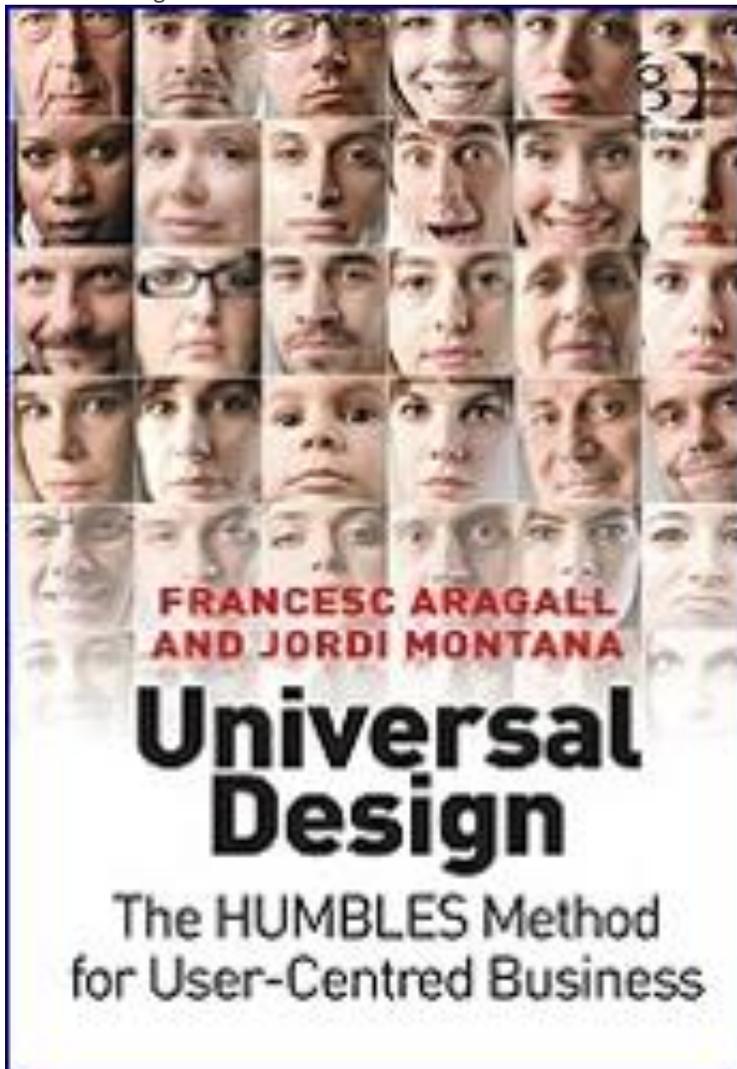
"Universal Design: The HUMBLES Method for User-Centred Business", writtenbyFrancescAragall and JordiMontañaandpublishedbyGower, providesaninnovativemethod to supportbusinesseswishing to increase the number of satisfiedusersand clients andenhancetheirreputationbyadaptingtheirproductsandservices to the diversity of their actual andpotentialcustomers, takingintoaccounttheirneeds, wishesandexpectations.

The HUMBLES method (© Aragall) consists of a progressive, seven-phaseapproach for implementing Design for All within a business. Byincorporating the user'spoint of view, itenablescompanies to evaluatetheirbusinessstrategies in order to improveprovideanimproved, morecustomer-orientedexperience, andtherebygain a competitiveadvantage in the marketplace. As well as a comprehensiveguide to the method, the bookprovidescasestudies of multinationalbusinesswhichhavesuccessfullyincorporated Design for All intotheirworkingpractices.

According to SandroRossell, President of FC Barcelona, who in company withotherleadingbusiness professionals endorsed the publication, it is "requiredreading for thosewhowish to understandhow universal design is the onlyway to connect a brand to the widest possible public, increasing client loyaltyandenhancing company prestige". To purchase the book, visiteither the **Design for All Foundation website**
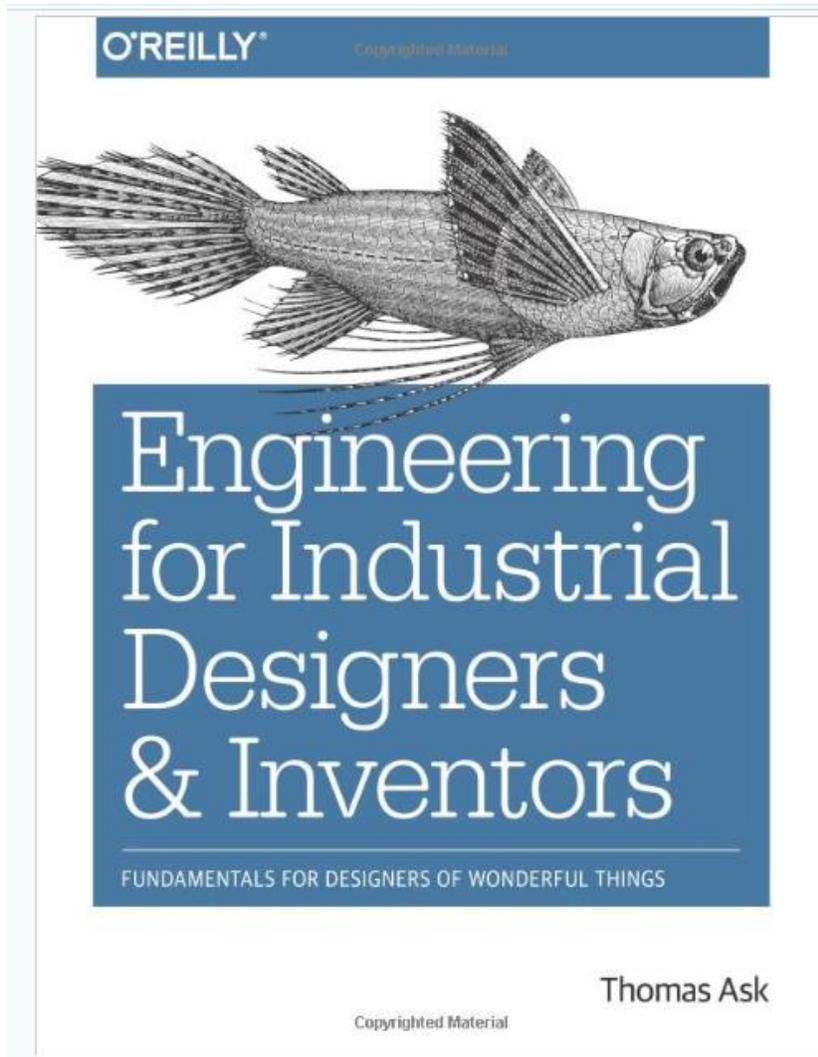
I have a new book that presents fundamental engineering concepts to industrial designers that might be of interest to you. This is the
link:
https://www.amazon.com/Engineering-Industrial-Designers-Inventors-Fundamentals/dp/1491932619/ref=sr_1_1?ie=UTF8&qid=1506958137&sr=8-1&keywords=engineering+for+industrial+designers+and+inventrs

APPEAL:

Dear Colleagues,

Once again we are beginning to prepare our newsletter, "Accessible Transportation Around the World." We invite you to send us news and photos concerning inclusive transportation in your country or region. Please keep in mind that our interest includes bus, rail, and door-to-door transportation, including the use of smaller vehicles and pedestrian paths that are accessible by vulnerable groups of any age, including school children with special needs and older adults with disabilities.

With all best wishes,

Tom

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www.globalride-sf.org

News

1.

Rick Hansen Foundation hosting 'Accessibility Assessor' courses

by Canadian Architect

Categories
- **Architects + Architecture**
- **Construction + Materials**
- **Students + Education**

Tags
- **Accessibility**
- **accessible design**
- **Rick Hansen Foundation**

Are you a building professional interested in advancing your knowledge of accessibility in the built environment? The upcoming Rick Hansen Foundation Accessibility Assessor course at Vancouver Community College may be a fit for you! This 10 day, 60-hour course starts Monday September 24th and runs until Friday October 5.

Rick Hansen Foundation Accessibility CertificationTM (RHFAC) is a LEED-style rating system that evaluates the accessibility of commercial, institutional, multi-unit residential buildings and sites. The system is the first of its kind in Canada to bring a standardized rating system to help owners and tenants rate the accessibility of their spaces from a holistic user-centric perspective. And with almost half of Canadian adults living with or

who have someone in their household living with a temporary or permanent disability, improving access is becoming more critical than ever.

Ratings are conducted by trained individuals with an RHFAC

Professional designation, and the Rick Hansen Foundation is calling for professionals in the building space (architects, urban planners, engineers, general contractors, design-builders, etc.) – who are interested in accessibility to register.

The course will provide participants with the knowledge and practical skills needed to rate a building for its overall accessibility under the RHFAC program, and once the RHFAC Professional designation is obtained, assessors will be publicly listed on the RHFAC Registry, hosted by CSA Group.

Participants in this course will learn about:

- The impact of the social and physical environment on people with disabilities;
- The relevant legislation, regulations, and standards needed when planning and executing an assessment;
- The Universal Design principles and standards when planning and executing an assessment;
- How to interpret and navigate a set of construction drawings; and
- How to communicate and support assessment findings to clients, and prepare a recommendation report of the assessment findings, reflecting compliance and gaps related to relevant human rights and accessibility legislation, regulations, and Universal Design standards.

Prerequisites for the course include:

- You have a diploma of technology in architecture, engineering, urban planning, interior design or a related program; or
- You have a Journeyman Certificate of Qualification in a designated trade related to building construction; or

- **You are an engineer or are eligible for registration as an engineer; or**
- **You are an architect or are eligible for registration as an architect; or**
- **You have a minimum of five years' experience related to building construction.**

Space is filling quickly so you are encouraged to register ASAP. Interested applicants can learn more about the Rick Hansen Foundation course [here](#) and register [directly with VCC](#).

(Source: The National Review of Design and Practice The Official Magazine of the RAIC)

Programme and Events

Access Israel's 6th Annual International Conference on
Innovation & The Future of Accessibility
29 April 2018 - Israel
Avenue Conference Center - Airport City

The DesignEuropa Awards celebrate excellence in design and design management among Registered Community Design (RCD) holders, whether they are individual right holders, small businesses or large enterprises.The Awards seek to recognise companies and designers that have brought outstanding design to the market with the support and protection of the RCD.

DESIGNEUROPA awards 2018
APPLY UNTIL 15 MAY!
Organised by

Submit your application or nomination before 15 May 2018.

GOOD DESIGN NEWS

**DESIGN CHAMPION
CITY OF AUCKLAND**

LUDO CAMPBELL-REID

Voices of Good Design - What is Good Design?

Australia's only international design award program is open for entries, across 10 design disciplines and over 25 sub-categories.

SOCIAL EQUITY BY DESIGN
DESIGNING CONNECTIONS THROUGH COMMUNITY

edra 49 OKLAHOMA CITY, OKLAHOMA
JUNE 6- 9, 2018

Join us for the **2018 EDRA49 Annual Conference** in the **Oklahoma City, Oklahoma!** Walk along the streets of Oklahoma City, home to an attractive variety of historic buildings. Eye-catching religious buildings, and magnificent structures of great architectural and historic significance. **Stay tuned for registration to open in late Fall.** Check out what OKC has to offer, click here.

**INTERNATIONAL FEDERATION ON AGEING
14TH GLOBAL CONFERENCE
TORONTO, CANADA**

IFA2018

The weather in Toronto has warmed up and the IFA is preparing with anticipation to host over 1200 delegates from more than 75 countries in August 2018.

Universal Design & Higher Education in Transformation Congress
30th October – 2nd November 2018, Dublin Castle
Transforming our World through Diversity, Design and Education

€30 billion
investment
under Horizon 2020 for Research & Innovation 2018-2020

CALLS LAUNCHED 27 OCTOBER

#InvestEUresearch
#www.ec.europa.eu/research

On 27 October 2017, the European Commission presented the final Work Programme for Horizon 2020, covering the budgetary years 2018, 2019 and 2020 and representing an investment of around €30 billion.

Horizon 2020: The EU's biggest research and innovation...

200 BILLION €

Human-Work Interaction Design (HWID'18) - Designing Engaging Automation
5th IFIP WG 13.6 Working Conference
August 20-21, 2018

Aalto University, Espoo, Finland

In continuation with the series of the Human Work Interaction Design working conferences, the fifth edition will take place in Espoo, Finland, on the 20th and 21st of August, 2018. The venue is the brand new building of School of Arts, Design and Architecture in Aalto University, Otaniemi campus.

Important dates:

Full paper submission deadline: April 2nd

Poster submission deadline: April 30th

Acceptance notifications: May 11th

Early bird registration deadline: May 31st

Conference: August 20-21, 2018

Theme, Scope and Focus:

This year's theme is Designing Engaging Automation. While we do not exclude other aspects of work analysis and designing interactions for work contexts, we encourage authors to share especially their research on human aspects in workplace automation in the 2018 edition of HWID conference.

Interaction design for work engagement has lately started to gather more attention, especially in designing tools for employees. Work engagement takes usability of interactive systems to the next level by providing employees pleasurable and meaningful experiences via the tools used at work. The theme of HWID'18 emphasizes the need for providing these experiences also when parts of the work are automated.

Examples of relevant questions include:

Is automation making work less interesting or more engaging?

How to improve work engagement by automation?

How to share work optimally between humans and automation?

How to maintain operator vigilance in highly automated environments?

How to support situation and/or automation awareness?

How to evaluate the impact of automation on work engagement?

This working conference aims to answer these questions to support professionals, academia, national labs, and industry engaged in human work analysis and interaction design for the workplace. We will discuss the tools, procedures, and professional competences needed for designing for and evaluating engaging automation in workplace contexts.

We invite two types of submissions:

Full papers (max 15 pages, excluding references) and

Poster submissions (max 4 pages, excluding references).

For both types of submissions, the authors must use the LNCS templates available from **Springer**. Please submit your work in PDF format to **EasyChair**.

All accepted papers will be published in the working conference proceedings in the form of an electronic copy with ISBN and made available to the participants. During the review process, the reviewers are asked to evaluate whether the paper is suitable for a HWID's Springer book (Springer-Verlag) that will be made available after the conference. We aim at most accepted full research papers to be included here, but also the possibility to have a very interesting perspective from industry or similar represented.

Conference web site: **https://blogs.aalto.fi/hwid2018**

Global Architecture & Design Awards
Architecture | Interior | Landscape | Urban Design | Product Design

rtf GLOBAL ARCHITECTURE AND DESIGN AWARDS 2018

MEDIA PARTNERS
ARCHIBAZAAR · World Architecture Community

OPEN TO ALL   ENTRY FREE FOR RTF MEDIA LAB MEMBERS

universal design CONFERENCE

4-5 September 2018
Brisbane
Convention and
Exhibition Centre

TRANSED
TAIPEI 2018

15th International Conference on Mobility and Transport for Elderly and Disabled Persons
(TRANSED 2018)

Mobility for all:
Connecting the World with Accessible Transportation

November 12 ▸ 15, 2018
TAIPEI INTERNATIONAL CONVENTION CENTER (TICC)

2nd World Summit
on Accessible Tourism
Brussels
1-2 October 2018

Destinations
for All

Build
Promote
Welcome

The Accessible Tourism Chain

The second World Summit on Accessible Tourism will present latest innovations
and best practices for the development of destinations for all.

In parallel to the summit, an exhibition will allow you to discover accessible tourist
destinations, products and services from all over the world.

www.destinationsforall2018.eu

Global Architecture & Design Awards

Global Architecture & Design Awards is one of the world's most prestigious Awards hosted by Rethinking The Future (RTF). RTF has been hosting Awards since 2012, and many esteemed Studios have been the winner of the Awards like Aecom, HOK, Aedas, Bjarke Ingels Group & Dialog, UNstudio, Perkins Eastman, etc. GADA is open to all the professionals and students across the world and offers more than 40 Categories divided into 'Concept' and 'Built'.

Participate Now

International Architecture Awards

One of the most famous Architecture Awards across the globe, International Architecture Awards hosted by Architecture Podium brings its winners to the top in the industry. Some of the previous winners include Aedas, TerreformOne, Rockwell Group, Pepe Gascon Arquitectura, Nadaaa etc. International Architecture Awards offer 30+ Categories under three groups' i.e.; Architecture, Interior Design and Product Design.

Participate Now

The Aga Khan Award for Architecture

The Aga Khan Award for Architecture (AKAA), established by Aga Khan IV in 1977, is awarded every three years to an architectural project that meets the needs and preferences of Islamic societies. The Award seeks to identify and encourage architectural concepts in the fields of community development, area conservation, contemporary design, preservation of the environment and landscape design.

Participate

Spring Edition - 05/01/2018 - New York, Seoul, Paris & Milan

2018 Spark Design Awards Are All Underway
All the various Spark Awards are welcoming entries now. They include
12 design specialties, so there's sure to be a good fit for your work.

GLOBAL ARCHITECTURE AND DESIGN AWARDS 2018

Schedule:
Registration Begins. 15 Mar, 2018

IAA 2018
About the Awards

International Architecture Awards 2018

After the huge success of previous International Architecture Awards, Architecture Podium is announcing IAA 2018. Architecture Podium created one of the largest awards in architecture and design with some of the esteemed studios as winners like Aedas, TerreformOne, Rockwell Group, Pepe Gascon Arquitectura, Morphogenesis, Dada & Partners, Nadaaa, XTEN Architecture, Mecanoo, ABIBOO Architecture and many more from across the globe making IAA one of the most successful awards.

The GQUAL Campaign, the International Disability Alliance and the International Disability and Development Consortium call upon States Parties to promote gender balance as well as quality and independence among the experts within the elections for the Committee on the Rights of Persons with Disabilities (CRPD Committee).
On June 12th, 2018, during the XI Conference of States Parties (COSP) to the Convention on the Rights of Persons with Disabilities, States Parties will elect 9 experts to the CRPD Committee.

2018
Breakthrough and Innovation
臺灣國際學生創意設計大賽
Taiwan International Student Design Competition

May.15 —— July.16

CALLING ALL DESIGN STUDENTS - ENTER TISDC TODAY!

Free to Enter | Registrations Close 16 July 2018 | Cash Prizes

We invite you to participate in the 2018 Taiwan International Student Design Competition (TISDC), the most participated International Student Design Competition in the world!

Universal Design & Higher Education in Transformation Congress

30th October – 2nd November 2018, Dublin Castle

Transforming our World through Diversity, Design and Education
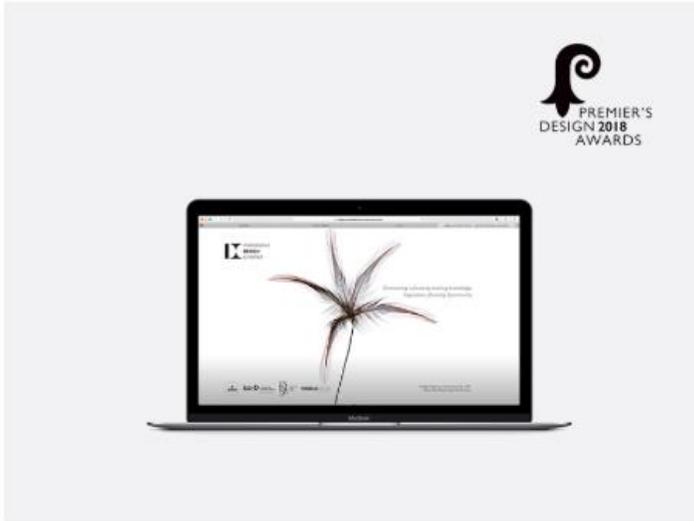
2018 PREMIER'S DESIGN AWARDS ANNOUNCED

A ground-breaking International Indigenous Design Charter has taken out the highest design honour in Victoria receiving the 2018 Victorian Premier's Design Award of the Year. The annual awards celebrate the state's best and brightest designers and innovators across categories including architectural, product and industrial, communications, digital and service design. MORE

Job Openings

Job Opening

Practo for Graphic Design requirement. Interested folks can reach out to Nirupama (nirupama.sharma@practo.com) to apply. Below are the requirements:

DESIRED SKILL SETS:

* 2+ years of relevant experience.
* Should be able to understand objectives set by the team and come up with visual design.
* Should be able to come up with good concepts and illustrate them.
* Have good understanding of colour concepts, icons, typography and design in general.
* Experience with Illustrations & iconography.
* Should be able to take detailed requirements from the team and pitch multiple concepts.
* Design aesthetically pleasing visuals which performs well on different screen sizes.
* Create design that aligns with the companies' design and brand guidelines.

ROLES & RESPONSIBILITIES:

* Creating exciting design solutions that have a high visual impact using illustrations.
* Should be able to generate graphic formats suitable both for print and digital advertising.
* Provide illustrations for marketing collateral, websites and social media.
* Adhering to brand guidelines & framework w.r.t. illustrations, iconography & visual guidelines.

Contact *Design for All*

Institute of India

Advertising:
To advertise in digital Newsletter
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Acceptance of advertisement does not mean our endorsement of the products or services by the Design for All Institute of India

News and Views:
Regarding new products or events or seminars/conferences/ workshops.
News@designforall.in

Feedback:
Readers are requested to express their views about our newsletter to the Editor
Feedback@designforall.in

Forthcoming Events and Programs:
Editor@designforall.in
The views expressed in the signed articles do not necessarily reflect the official views of the Design for All Institute of India.

Address for Correspondence:
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