TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
PULCHOWK CAMPUS

THESIS NO.: 076/M.ARCH/012

Critical Regionalism, for Contextual Architectural Development in Kathmandu

by

Prakash Maharjan

A THESIS
SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTERS IN ARCHITECTURE (M.Arch.)

DEPARTMENT OF ARCHITECTURE
LALITPUR, NEPAL

September, 2022

COPYRIGHT

DECLARATION

I hereby declare that the thesis entitled **"Critical Regionalism, for Contextual Architectural Development in Kathmandu"** which is being submitted to the Department of Architecture, Pulchowk Campus, Institute of Engineering, Tribhuvan University. in partial fulfillment of the requirements for the degree of **Masters in Architecture (M.Arch.)** is a research work carried out by me, under the supervision of **Asso. Prof. Dr. Sanjaya Uprety** between April 2022 to September 2022. I declare that the work is my own and has not been submitted for a degree from another University.

APPROVAL PAGE

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
PULCHOWK CAMPUS

The undersigned certify that they have read, and recommended to the Institute of Engineering for acceptance, a thesis entitled "**Critical Regionalism, for Contextual Architectural Development in Kathmandu**" submitted by Prakash Maharjan (076M.Arch012), in partial fulfillment of the requirements for the degree of Masters in Architecture.

……
Supervisor:
Dr. Sanjaya Uprety
Associate Professor
Department of Architecture, IOE

...……
External Examiner:
Ar. Lusan Nakarmi
Architect/Urban Designer
Vriksha Associates

……
Program Coordinator:
Dr. Ashim Bajracharya
Associate Professor
Department of Architecture, IOE

Date: September, 2022

ABSTRACT

Literature demonstrates how modernization and globalization have impacted contemporary architecture, resulting in a style that pays little attention to the pre-existing local and regional styles. In response to the international architecture practiced in the West, critical regionalism, as described by theorist Kenneth Frampton, has found use in various parts of the world. It is an architectural idea that aims to strike a balance between local requirements and resources and the developing modernization teachings. After the emergence of democracy in the 1950s, Kathmandu began to embrace modernism while retaining its medieval urban culture. But rapid urbanization resulted in the valley's chaotic architectural expression. This paper seeks to examine the critical regionalism approach in architectural practice and identify key characteristics that support this approach. In order to gain a deeper understanding of the applications of the identified attributes, two case studies—the Taragaon Complex by Carl Pruscha in Kathmandu and the Saynatsalo Town Hall by Alvar Aalto in Finland—were chosen. Three factors—climate, spatial attribute, and material—were chosen based on theories to help decide if the chosen cases critique or assess an established theory of regionalism. These characteristics were verified using a different method, including literature reviews, field observations, interviews with key informants, and computer modeling tools. In order to learn more about traditional valley architecture, one traditional structure, the Dhakhwa home, was also visited. Using Autodesk Ecotect 2011 simulation software, climatic analysis of the chosen case buildings was carried out. Both the Dhakhwa House and Taragaon buildings, according to the simulation's results, are fit for Kathmandu's climate. Although there is a minor departure from the best fit orientation, the outcome is consistent with the suggested direction for Kathmandu. The results of the interviews also demonstrated the necessity for further consideration of other factors in the context of Kathmandu for contemporary architectural development, including topography, context, material, and spatial features.

ACKNOWLEDGEMENT

Foremost, I would like to express my greatest thanks to my thesis supervisor Assoc. Prof. Dr. Sanjaya Uprety for his continuous support, guidance, motivations and patience to complete this work. His kind support helped me in all the time of research and writing of this thesis. Besides my supervisor, I would like to thank program coordinator of Masters in Architecture (M.Arch) Assoc. Prof. Dr. Ashim Bajracharya and Head of Department of Architecture Prof. Dr. Sudha Shrestha. My sincere gratefulness to the teachers of the department for their kind support, assistance, and advice whenever needed.

In addition, I would like to thank all my friends who directly or indirectly helped me in this thesis work. Last but not the least, I would like to thank my parents and my family members for supporting and trusting me throughout my life.

PRAKASH MAHARJAN

076M.Arch012

Department of Architecture

IOE, Pulchowk Campus

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

CEDA	Centre for Economic Development and Administration
CR	Critical Regionalism
DHM	Department of Hydrology and Meteorology
GL	Genius Loci
MA	Modern Architecture
PoMo	Post Modern Architecture
RA	Regional Attributes
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

CHAPTER 1. INTRODUCTION

1.1 Background

As human needs change, architecture is adaptable and constantly adopts new science and technology. Due to the speed of technological advancement, science and technology cannot be restricted to one area and are used throughout the world. Similar to how the architectural style of one location or nation is accepted in another, it is also adjusted to fit the local environment, sociocultural background, and religious beliefs (R. S. Shah, 1985a). With the stages of evolution of architectural styles, we have achieved many remarkable buildings. But with the new styles, it lacked a response to culture, context, and its surroundings and didn't create a perfect human living environment that can express human emotions and passions (Khader, 2016). With widespread modernism, the efforts which are made to highlight regional and local concerns were left behind.(Powell, 1985). Thus, the need arises for an essential need to study architecture related to society, architecture that considers community needs, context, climate, and surrounding environment (Khader, 2016).

In the context of Nepal, especially in Kathmandu valley, urbanization took place after the post 50s with globally accepted modernism. Earlier, few foreign architects such as Carl Pruscha, Louis I Kahn showed their romantic ideas and expressed them as good reflections of the valley's architecture in their works. But with the rapid growth of the city in these past few decades, architects started to sacrifice environmental and traditional aspects for an appearance of modernity. This is due to the dominance of architecture by the private sector and capitalist market. This has raised questions about the architectural identity of the valley and has become a matter of discussion. "One possible approach was to draw influences from architectural heritage and tradition and apply them in a contemporary context. Critical Regionalism is one such approach that puts Regionalism and revival of architectural heritage in perspective and makes it contextually appropriate" (Bani, 2015, p. 3).

An approach called critical regionalism uses contextual factors to infuse Modern Architecture with a feeling of place and purpose in an effort to combat placelessness and lack of meaning. Critical regionalism's architectural aesthetic aims to offer a structure that is established in modern tradition but connected to its geographic and cultural setting. It's not just regionalism in the traditional sense; rather, it's a forward-

thinking design philosophy that aims to bridge the gap between the universal and regional architectural languages (Menon, 2016). Architectural theorists Alexander Tzonis, Liane Lefaivre, and Kenneth Frampton created the term "critical regionalism" in the 1980s to designate works that combine contemporary architecture with local traditions. A definition of critical regionalism is an architectural strategy that responds to the physical characteristics of a location, such as its climate, geography, architectural history, tectonics, and sociocultural context (Bahga & Raheja, 2020).

That is why Critical Regionalism is chosen for this study because the architecture in Kathmandu needs to be thought of and viewed from a "critical perspective" to be able to bridge the gap between the modern, the global, and the traditional. Few architects, and conservationists are working with the traditional approaches as their design philosophy whereas most others are only widely accepting modern ways of architectural design. This has raised debate about how the cityscape of Kathmandu needs to be presented. So, this research seeks to examine those regional attributes, to fill the gap that current architectural growth has made. Findings from this research will provide recommendations for related authorities such as government, architects, planners, developers, and stakeholders to lead contextual architectural development in Kathmandu and other regions.

1.2 Statement of the Problem

Literature shows that contemporary architecture has been affected by modernization and globalization, leading to architecture with little attention to the existing local and regional architecture. Bani(2015) claimed that residential architecture watched rapid changes due to the dominance of architecture by the private sector. Architects started to sacrifice environmental and traditional aspects for an appearance of modernity, which interrupted the evolutionary process of residential designs and replaced the Local Style with Foreign Culture. El Kheir (as cited in Bani, 2015) noted "Khartoum is aging and turning into a nightmare of a city. The city's problems are getting worse and require serious, immediate attention, despite the fact that modern buildings have frequently been planted here and there, several showcases of landscaped zones and attempts at beautification adorn its central areas, and new, luxurious housing estates are emerging with sometimes incomplete resemblance to their context."

According to Frampton, media influence Western architectural practice today. The design goal is to increase the work's marketability and attractiveness. He argues that architects create images that are riddled with aesthetic cliches, with buildings frequently being created more for their photogenic appearance than for their potential for experiential learning (Frampton 1991c, 26). The usual outcome is that architectural masterpieces are drastically reduced to a "image" devoid of any underlying linkages or meanings.

With the starting of modernism only a few decades back, presently the architectural development seems to have ignored the urban fabric, disregarding context and surroundings. It seems that regional attributes (both cultural and environmental) have not been considered, to make contemporary architecture contextually appropriate in the modern context. Moreover, we also tend to care more about showiness rather than designing buildings that take into account the context, urban fabric, and environment. The government also seems to have more concern for modernism from a business point of view discarding local needs and issues. From the local level also, people seem to have attracted more in developing structures to stand as unique (not to be said *Iconic*) disregarding the context and surrounding environment. So, proper language of modern architecture (based on regionalism) seems to be lacking in Kathmandu (in Nepal).

In a similar vein, Uprety(2020) also suggests that we are not being able to integrate regional attributes in this current trend of architecture in Kathmandu. We are only focusing on certain aspects such as Façade Treatments and copying a certain style of local context rather than understanding whole regional attributes. So, the whole idea of critical regionalism is still in a premature stage.

1.3 Need of the Research

“The Democratic Restoration in 1950 allowed for Nepal's opening to the contemporary world. Since then, a number of international architects have worked in the nation and contributed to its architectural design. The scale, complexity, funding, and purpose of the projects determine the type and qualities of these streams, which are reflected in the architectural work produced by these international architects. Exposure to the variety of architectural production produced by these international architects provides substantial learning for the emerging architects in Nepal, a country where the role of the modern architect is only now being appreciated” (B. Shah, 2016). But the

architectural trend seems to lack direction in this modern development phase. With the economic and political changes, the government, as well as people, seems mostly focused on the capitalist market. Despite promoting contextual architecture, haphazard modernization is in trend. This has led to declining in architectural relation to culture, context, and surrounding environment with the loss of architectural identity in the valley. The city has also faced rapid haphazard growth within the last few decades. In the name of modernization, we are embracing every new innovation. Therefore, if the topic is not addressed seriously, we could experience identity issues in the future (R. S. Shah, 1985a).

Literature has also argued that social context shapes a variety of cultural and environmental components of society. The natural environment comprises geography and climate, whereas culture encompasses features of daily living. On the other hand, modernism, through the sub-theme of internationalism, asserted the universality and applicability of some architectural ideals and virtually eliminated any "Regional" building characteristics (Powell, 1985).

After leaving British Colonial authority, India adopted modernism as the favored style for new construction and urban planning. (Kassim et al., 2018; Mehrotra, 2008; Prakash, 2010)(Bahga & Raheja, 2020). However Indian architects began realizing the limitations of modernist architecture by the 1960s as it seemed inadequate to fulfill social and cultural aspirations (Jadhav,2007)(Bahga & Raheja, 2018). The need for critical regionalism was also realized by Indian architects. In order to combat the standardization of architecture brought on by modernism, Indian architects like as Raj Rewal, Charles Correa, and Balkrishna Doshi began implementing the principles of critical regionalism into their projects in the 1970s and 1980s. (Lang, 2002; Misra et al., 2018) (Bahga & Raheja, 2020).

1.4 Importance of the Research

The lack of proper planning and implementation leading to haphazard development in the Kathmandu valley has resulted in many problems. Its impact can be greatly realized in the architecture sector. With the pace in global communications after the 1950s, modernism in the valley should have flourished well, taking contextual development into account. But unstable political conditions and a capitalist market led to the rapid growth of the valley in the last few decades. Only had been “Kathmandu Valley

Development Plan" by Austrian architect Carl Pruscha in 1964-74 been implemented properly, city growth might have been controlled well.

The architectural growth that happened in the past few decades has not focused on the regional and contextual aspects of the valley. The government lost track and so as architectural practitioners too due to rapid city growth. Even with plenty of architects, planners, and policymakers in current days, contextual development in Kathmandu has not been addressed properly.

The research makes an effort to fill in any knowledge gaps about the architectural context of the Kathmandu Valley. The results of this study are anticipated to help government organizations create policies for improving architectural development that will be appropriate for the local setting. Additionally, by focusing on the context of regional building traditions, urban landscape, socio-cultural conditions, technology, and climate, the research will be helpful for practitioners and scholars of contemporary architecture in Nepal (especially Kathmandu) in understanding the values of regional attributes and aiding them in implementing them in their work. Additionally, the findings from the research will be helpful in the architectural academic sector to inspire new architects in adapting regional, contextual attributes in modern forms. Notably, Bahga & Raheja (2018) also pointed out that proponents of critical regionalism work to combine global technological and architectural advancements with regional sensibilities derived from spatial, cultural, and historical contexts in order to preserve a particular country's architectural identity.

1.5 Research Purpose

This research seeks to find the regional attributes to be considered in order to define the contextual modern architecture for Kathmandu. The problem statement followed by the research gap led to the following research objectives:

- To evaluate regional attributes that define Valley architecture in the modern context.
- Perception measurement of different users to figure out views on valley architecture in a modern context.
- To evaluate contemporary architectural practices by Nepali practitioners reflecting regional attributes.

1.6 Validity of research

With the global embracement of modernism, it has become a threat to local styles in developing countries. Early in the 1980s, when Postmodern architecture—which itself was a reaction to Modernist architecture—was at its height, the concept of critical regionalism first came to be. "Critical regionalists hate post-modern architecture for incorporating disparate historical allusions into contemporary works without taking their appropriateness into account." (Mehrotra, 2011, pp.122)" (Bahga & Raheja, 2018). There has been a huge number of research done in this particular field. Those researchers highlighted the critical regionalist movement as a necessary tool for the revival of local architectural heritage in perspective and make it contextually appropriate. Similarly, its significance can also be realized in the context of Nepal where many architectural diversities in terms of topography, religion, culture, and ethnicity exist. Modernity has not taken so much height in the Nepali context but looking at the architectural progression, direction loss can somehow be realized. A review of a few available kinds of the literature shows that architectural progression inside Kathmandu valley is being carried out haphazardly in the name of modernity and has neglected contextual forces. The gap between the traditional architecture and the globalized modernization has made necessary of critical regionalist movement inside the valley. This is an area that has not been given due attention by the researchers. So, this research is intended to fill that gap.

1.7 Scope and Limitations

The research is limited to detailing of a few the most relevant attributes for critical regionalism in Kathmandu. The study is centered on parameters from theoretical realm, which will be tested upon Case 1 i.e. Dhakhwa house (Traditional), and Case 2 i.e. Taragaon complex (Early modern in Kathmandu). Also, in-depth interview with professional and educator, is another source of data for the research.

1.8 Thesis Outline

Background information on the problem statement, need for and significance of the research, and research purpose is provided in the introduction chapter. In order to place the upcoming research within the existing theoretical domain, Chapter 2 reviews pertinent literature on Critical Regionalism. The study approach employed is explained and justified in Chapter 3 along with the data collection technique. To identify a study

area and its parameters, Chapter 4 gives the study context. Data is gathered in Chapter 5 through fieldwork and case studies. While field visits are also conducted for national instances, secondary sources are used to study international cases. Insights from five key informants' interviews are also included. The results of the analysis and research findings are presented in Chapter 6, which is followed by a discussion section. The research is concluded in Chapter 7, which also offers directions for further study.

CHAPTER 2. LITERATURE REVIEW

2.1 Development of Modern Architecture

Architecture is the only art form that is functional, according to architect Reese Rowland. It affects our lives so strongly because of this. We may express our personalities and ideals through where we live and work. The architectural forms encircle all of our connections, dreams, and recollections (Sauce, 2015). Different architectural styles have evolved over time, but the fundamentals of architectural design—such as creating and defining spaces and observing how light interacts with them—have remained constant both before and after modernism. The only thing that has changed is how the materials are used and connected (Ibid). Modern architecture emerged shortly after the industrial revolution in the 19th century led to the development of new building materials. It was developed with the purpose of advancing modern society (Erviansyah, 2020). Typically prefabricated or built-in factories, modernist architecture has little to no adornment. Glass, metal, and concrete are frequently used in the structure, and the design places a strong emphasis on function. The early architectural styles, which value art, crafts, and adornment, are different from modern architecture. Modern architects reject traditional designs from a philosophical standpoint (Craven, 2020). The early modernist movement didn't fully disregard history, either. The Bauhaus, located in Germany, is one of the most well-known examples of early modern architecture from the 20th century. Walter Adolf Georg Gropius, an architect, designed it in 1919. Gropius followed the path created by Charles Rennie Mackintosh and Sigfried Giedion in contemporary architecture, emphasizing function above adornment and fusing balanced forms. Bauhaus planted the seeds for modern architecture and gave birth to other modern movements including Constructivism, Expressionism, and De Stijl. Although this usually resulted in building that had a clear identity, contemporary architecture veered more toward functionalism in the middle of the 20th century and rejected the notion of ornamentation as a pure form of avant-garde and aesthetic purpose (Erviansyah, 2020). Some of the styles that emerged in the middle of the 20th century include functionalism, minimalism, international style, metabolism, and brutalism. Many individuals dislike modern architecture because it lacks contextuality, personal identity, and the fundamentals of human-centered design. After all, it dictates how people should live rather than designing around how they do. Modernism is still very diverse since it isn't only the

fruit of one single genius, even though the majority of modernists reject contextuality. Contrary to what modernist architects typically do, others have attempted to humanize the design rather than reform the human. Frank Lloyd Wright and Louis Kahn explore the other side of modernism through the spirit of contexts, the harmony with nature, the revival of historical context to create a sense of regionalism, and the idea of communality; as a result, they could be seen as the rogue architects and the early post-modernism. In post-modern architecture, ornamentation and contextuality are being reevaluated as elements that are necessary to give each structure its own distinct personality. Regionalism evolved as a result of combining modernism with local regional identity and customs (Erviansyah, 2020).

2.2 Modernism in developing countries

Modernization is a global phenomenon, although in Western and Non-Western societies, its causes and timing were different. Traditional societies must undergo some modifications in order to become modern. Before traditional communities in the west underwent modernization, there was a protracted period of transition. Modern societies emerged from traditional ones as a result of technological development, the Industrial Revolution, and increasing urbanization. Modernist architecture, according to William J. R. Curtis, was the result of a progressive attitude that promoted industrial growth and, in turn, caused a gradual transformation in the social and economic conditions of the West. Similar to this, Frampton criticizes modernism's homogeneity while acknowledging its technological value and cultural prospects for human settlements during the past century (OROZCO, 2011).

Modernization had a completely different timeline and narrative in non-Western nations. In general, modernization originated in the West as an indigenous process, whereas it expanded to countries in Asia, Africa, and Latin America as a result of foreign factors interacting with traditional communities. And in the majority of cases, modernity in these nations started during their colonialization by the West. Modernization was seen as the only means of fending off the pressure and threat posed by Western political, military, and economic powers. With time, the existing social order was expanded by importing science, technology, and institutions wholesale from the West. Traditional societies throughout the non-Western globe have undergone extensive change. Instead of modernization and transition, many of these changes result in the erasure and extinction of tradition (Fu, 1990). According to Curtis, this quick

transformation prevented developing nations from accurately capturing the depth and real essence of modernism in their built environments.

After India gained independence from British colonial control in 1947, modernism became the chosen style for new construction and urban design. Modernism, however, was lost in translation when India faced the transfer of mass-produced, featureless blocks that did not adequately respond to local conditions in the succeeding decades (Shah, 2008). Indian architects struggled to get modernism accepted in the public imagination because they were unable to fully handle the complex local sociocultural considerations in their designs (Mehrotra, 2011, p. 32) (Bahga & Raheja, 2020).

2.3 Vernacularism

In 1964, Bernard Rudolfsky, an Austrian-American author, referred to vernacular architecture as "architecture without architects." It was defined by Oliver (As cited in Qtaishat, Adeyeye, Emmitt, 2018) as " the homes and other structures erected by the populace, usually by their owners or communities using traditional building techniques, and connected to their natural surroundings and resource availability." Each type of vernacular architecture was made to suit the beliefs, economies, and way of life of the people who produced it.

The term "vernacular architecture" refers to the styles of buildings that allowed traditional societies create their own distinctive architectural character and meet environmental obstacles (Motealleh et al. 2016). This architecture is regarded as the outcome of centuries of optimization to produce a cozy home in a particular climate utilizing readily available materials and well-established building techniques (Bodach et al. 2014). It distinguishes itself as a significant source where essential design components, such as climate, technology, culture, and accompanying symbolism, have existed and developed during the centuries that people have been concerned with architecture (R. S. Shah, 1985b).Vernacular structures are made by people and are the outcome of relationships between people and many ecological, economic, material, and social elements. They have developed via trial and error (Lawrence 2006). The aforementioned concept places an emphasis on where vernacular architecture fits into the larger global context. Additionally, the building was aided by existing technologies within a cultural and environmental context.

Buildings that "belong to a location, that express the local or regional dialect" can be summed up as vernacular architecture (Bonner, 2006, p.23). The success of these structures being well adapted to their context and climate, in generating energy-efficient and comfortable surroundings, was a process where local knowledge and expertise played a key part. Buildings are described as elements that fit into their technological and environmental surroundings.

2.3.1 Influences on the vernacular

There are various architectural shapes for practically every situation due to the influence of vernacular architecture, which is influenced by a wide range of diverse aspects of human behavior and surroundings. Even if two villages appear to be similar at first glance, they may have subtly different ways to building and using their homes.

- **Climate**

The macroclimate of the region where the building is erected is one of the most important factors influencing vernacular architecture. Buildings in cold areas almost always have a lot of thermal mass or insulation. Openings like windows are typically small or nonexistent, and they are typically sealed to prevent heat escape. Buildings in hotter climates, on the other hand, tend to be made of lighter materials and allow for substantial cross-ventilation through structural apertures. Buildings have varying shapes based on the amount of precipitation in the area, with sloped roofs being common in locations with a lot of precipitation. There are significant and sometimes intricate climatic influences on vernacular building. Specializations in dealing with different climatic conditions weren't deliberately developed; instead, they were learned by trial and error over the course of generations of building construction, frequently before the scientific theories that explain how they work.

- **Culture**

Building shapes are greatly influenced by the manner that buildings' occupants live and use their homes. The design and size of homes will vary depending on a variety of cultural considerations, including the structure of family units, who utilizes specific spaces, how food is prepared and consumed, social interactions, and many other issues. Residents usually decorate homes according to local customs and beliefs, which has a big impact on how vernacular homes appear.

2.3.2 Vernacular Architecture in today's context

Knowing the deeper meanings and values of traditional architecture, the method is employed as sources of inspiration for modern design. Authors, architects, and academics who are interested in vernacular architecture and how it can contribute to society in the twenty-first century emphasize learning from rather than copying vernacular elements without taking into account changes in political, cultural, economic, and environmental values over time. According to Isaac Meir and Susan Roof (2006), using vernacular characteristics as morphological emblems runs the risk of misrepresenting the motivation behind studying the vernacular and its development and "denies us the benefits of reinterpreting (understanding) rather than re-using (copying), the technology" (Ghodsi, 2012). The ability to comprehend these local customs will enable the creation of truly sustainable structures for the new millennium (Asquith, Vellinga, 2006). In his statement, Hassan Fathy reaffirms this idea, saying that

"The architect must revitalize architecture from the point at which it was abandoned and attempt to close the gap in its development by examining the elements of change, modifying the effective procedures established by our ancestors using modern techniques, and then coming up with new solutions that meet contemporary needs." (Fathy, 1986, p.xxiii)

2.4 Regionalism

Regionalism is a shared sense of identity shared by individuals from a certain geographic area who are connected by common language, culture, and ethnicity. It is the context and traditions of construction in a particular location as seen through the lens of architecture. These structures require a thorough understanding of the local climate, geology, geography, and topography. Critical regionalism and regionalism are not the same thing. Comparatively speaking, critical regionalism is considerably more vernacular in nature and is less of a response to the local context that currently exists. An example of a post-modern response to architecture is regarded to be critical regionalism. A crucial component of regionalism is the climate. Fountains in the courtyard use evaporative cooling (cool water cooling the surrounding air). A superb illustration of local architecture is Adobe. This mud and straw construction material has a high thermal mass, making it a heat-insulating material of choice (Doyle, n.d.).

Geoffrey Bawa, a Sri Lankan architect, is credited with founding South Asian regional modernism. Along with him, prominent modern proponents of the use of the vernacular in architectural design include Sheila Sri Prakash, an environmentalist who has been influenced by rural Indian architecture, Charles Correa, a well-known Indian architect, Muzbarul Islam, Bashirul Haq, two well-known Bangladeshi architects, and Balkrishna Doshi, another Indian, who formed the Vaastu-Shilpa Foundation in Ahmedabad to research the vernacular.

The local culture, environment, and technology of the time are all strongly tied to regionalism's traits. The following are characteristics of regionalism:

- Employing contemporary technologies and locally sourced building materials;
- Adapting to the particular climatic conditions in the area;
- Addressing culture, history, and the significance of place and space;
- Seeking cultural content and purpose rather than style as the end result.

These qualities help to enhance the space's sense of place overall.

2.5 Development of Critical Regionalism

Alexander Tzonis and Liane Lefaivre first established the architectural idea of Critical Regionalism in their 1981 article, "The Grid and the Pathway," and Kenneth Frampton later extended it in his 1983 essay, "Towards a Critical Regionalism: Six Points for an Architecture of Resistance." Its initial goal was to provide an alternative to the 'International Style' modern architecture crisis, which begs to be different from the 1980s postmodern architecture that was then being promoted as the primary answer to the issue. The idea that these modernist structures provided an anonymous architectural environment developed when the large-scale reconstruction initiatives that followed the Second World War altered the appearance of entire European towns by the 1960s. Local communities began to view them as alienating "boxes" of generic technology that ignored their own cultural identities or demands. By supporting architectural designs that maintained their linkages to the unique climatic, topographic, historical, cultural and sociopolitical conditions of their locales, critical regionalism sought to address these problems. Without disparaging modern architecture's progressive sociopolitical goal, it promoted socially conscious techniques that solved its dilemma. In order to reconcile global modernization with local communities' cultural identities, critical

regionalism envisioned a "architecture of resistance." It encouraged municipal structures and practices that upheld their linkages to particular locations in order to combat both the modern built environment's commercialization and its opposing postmodernist transition into scenography (Giamarelos, 2022).

Critical regionalism was widely adopted by the "centers" of architectural-theory development in Western Europe and North America in the 1980s. The 1990s increased its applicability as an architectural idea that protects a location's unique culture from the homogenizing effects of globalization. In the same decade, it began to be used as a helpful framework to examine comparable issues in these non-architectural sectors by a wide range of other disciplines, from philosophy to cinema theory. As cities grow to become massive metropolises that distance local populations, critical regionalism is still a popular architectural strategy today, particularly among architects in those regions of the world. Today, its fundamental tenets—such as respecting a location's terrain, history, materials, climate, and culture—are emphasized to future architects as essential elements of successful design.

Theorists of critical regionalism characterized their strategy as one of resistance to globalization; as the term "globalization" became more popular in the early 1990s. This method produces architecture that challenges conventional notions of both globalization and regionality. It is suitable for architects who want to avoid literal replicas of both local and worldwide architectural forms. As a result, Tzonis and Lefaivre's criticality was meant to be reciprocal; it neither favors the "local" over the "global" or the other way around. Mottos like "think globally, act locally" and "glocal" buildings and urbanisms can be used to summarize this architectural style, which contrasts "the global" with "the local."

2.6 Critical Regionalism

There is conundrum on how to advance modernity while going back to the roots; how to reawaken a long-dead civilization while participating in a global civilization. Participating in modern civilization requires one to simultaneously engage in technical, scientific, and political logic, which frequently necessitates the outright rejection of an entire cultural past. It is a fact that no culture can survive or absorb the shock of contemporary civilization. As a result, traditional culture has been gradually destroyed by the phenomena of universalization.

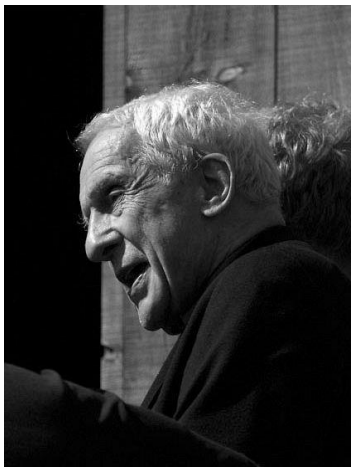


Figure 2.1: Kenneth Frampton
Source: www.architecturenorway.no

In his seminal book on the subject of Critical Regionalism, Toward a Critical Regionalism: Six Points for an Architecture of Resistance, Kenneth Frampton describes modern culture and buildings as moving toward a state of civilization that is both universally conditioned and exhaustively optimized by technology. According to him, the skyscraper and the motorway, two iconic emblems of contemporary society, have constrained urban form by establishing uniform building techniques and methodologies. Critical regionalism, which His answer to this conundrum is what Frampton calls as "mediating the impact of universal civilization with qualities gained indirectly from the idiosyncrasies of a particular region." The world is becoming more homogeneous and universal as a result of globalization, mass consumption, and the internet, but Frampton thinks that a turn toward a critical regionalism can revive the feeling of "place" that is rapidly disappearing (Solie, 2012).

Kenneth Frampton's "architecture of resistance" emphasizes local site and environmental factors including light, topography, context, and climate as a means of overcoming "placelessness" and the universal.

With the publication of "Towards a Critical Regionalism: Six Points for an Architecture of Resistance" in 1983 and "Ten Points on Architecture of Regionalism: A Provisional Polemic" in 1987, Frampton first introduced the idea of critical regionalism.

According to Frampton, critical regionalism seeks a compromise between the desire to go back to pre-industrial times and modernity's fiction of progress. It is possible to create architecture which does not fall into one of the two conceivable extremes, as shown by the use of the avant-garde viewpoint. A middle ground is the ideal course of action, according to the plan, which at first appears to be a critique both of modernism and traditional architecture. However, a closer examination reveals that although the assumption is simple, it is not necessarily true or even relevant. The fundamental problem is that Frampton speaks from the perspective of North American and European architects, societies who have begun the industrialization process, gone through it, and are now able to look back on prior periods.

Although initially based on Mumford's theories, which served as the foundation for Frampton's investigations, Carl Pruscha comes to slightly more complex findings about the Critical Regionalism. While agreeing that " Instead of being associated with romanticism or a return to tradition, regionalism is now considered as a tool that helps people accept their current circumstances," Pruscha continues to make the case that modernism and regionalism might really complement each other rather than taking two completely distinct paths. Both Frampton and Pruscha offer theories that define the idea of critical regionalism. However, their perspective and the conclusions they draw on the significance and use of this concept are different. The vernacular forms of the past are only that—vintage architecture in Frampton's view, and returning to them would be a step into the kitsch. Pruscha, on the other hand, believes that the vernacular architecture and its significance are very immediate since, in his opinion, people can often learn from it without having to look to the past because it is frequently still very present and, in some cases, even still built (DORJI, 2016). As a result, the Carl Pruscha-developed critical regionalism approach is a little more pertinent to the thesis's goals because it discusses developments in developing societies, where tradition still remains strong and modernity and the effects of industrialization are still barely making an impression.

2.7 Place and Placelessness

Contemporary architecture, especially in urban areas, has been globalized, homogenized, and standardized, while the effects of such a significant international adaption of architectural concepts are not fully understood. Although one can move from one global center to another without noticing differences in architectural

compositions, this appropriation of culture and history is only increasing exponentially, leading to an overabundance of placeless architecture (Lambrecht, 2020).Depending on the area of concentration, many different notions are included in the definitions of space and location. In contrast to space, which is usually employed in the field of architecture to depict the objective distance a human may walk, place has been described as a subjective and situational area that reveals deep relational histories, identities, and exhibits cultural foundation. The forces of globalism and urban growth continue to blur the boundaries between spaces and locations as technology enables humankind to upgrade at an unprecedented rate. However, as these distinctions change, a brand-new spatial idea called placelessness has evolved. Placelessness refers to a subjective spatial quality in which a location is impersonal and resides between the hazy border between space and place, as opposed to being categorized as a space or place (Lambrecht, 2020).

Geographers like Yi-Fu Tuan, Anne Buttimer, and Edward Relph began exploring place as it plays a crucial part in the human experience in the early 1970s. In his work "Place and Placelessness," Edward Relph attempted to delve into the concept of place. He argues that it is impossible to study place attachment, sense of place, or place identity without a complete understanding of the complexity and richness of place as it is experienced and generated by actual people in actual places. It's a topic for debate that has to be investigated using a phenomenological method. A thorough examination of a location may help with its preservation, creation, and creation of new locations. He contends that it would be difficult to explain why a particular location is exceptional and impossible to know how to fix existing places that need fixing without a deep understanding of place as it has human importance. Canter (1977–79) created his "Psychology of Place," contending that people's perceptions of a place are influenced by its physical characteristics as well as by their beliefs and behavior. The theory of "Transactional Settings," which Stokols and Altman (1987) established on the basis of Canter's theory, describes the relationship between a location and a person as an interdependent process. Parallel to this, the term "place" has been used in geography since the 1970s as a "location," and later it was expanded to mean a "place to live". Norberg-Schultz stated in 1976 that places are those areas where life exists and that the 'genius loci,' or'spirit of place,' has been acknowledged since antiquity. In this sense, "Place" refers to the associations and feelings we have when we encounter or hear about

a particular location, as well as its tangible and intangible qualities (Elnachar, 2011) (Eman El Nachar, 2018).

In understanding place in depth, Relph focuses on people's identity of and with place.

Identity of place: It is defined as the "permanent sameness and unity that allows that [place] to be distinguished from others" (Relph 1976, p. 45). Relph breaks down this enduring identity into three parts: (1) the physical environment, (2) the activities, situations, and events that take place there, and (3) the individual and collective meanings that are derived from those experiences and intentions.

Identity with place: It is the idea of being inside—the level of attachment, participation, and concern that an individual or group has for a specific location.

Relph also developed the idea of Insideness and Outsideness, according to which various locations take on various identities for various people and groups, and the human experience assumes various aspects of feeling, meaning, ambience, and activity. The position of complete, unaffected immersion in place that most people experience when they are at home in their own neighborhood and area is what Relph refers to as existential insideness. He describes existential outsideness as the opposite of existential insideness, which is a feeling of strangeness and alienation experienced by people who are new to a place as well as those who have left their birthplace and returned only to feel strangers because it has changed from how they remember it in the past. He offers a language that enables a clear characterization of the unique experience of a unique person or group in connection to the unique place in which they are found, particularly through the continuum of insideness and outsideness. Relph also provides a vocabulary for describing how and why the same place can be viewed differently by various people (such as a local for a long time, a visitor, or a researcher who studies the area) or how, over time, the same person can view the same place differently at different times (such as the home and neighborhood that seem so distinct when one's significant other dies). According to Relph, a genuine sense of place is gradually being replaced in our time by a less genuine mentality he called placelessness: " the careless destruction of distinctive places and the creation of uniform landscapes as a result of a lack of understanding of the importance of place " (Relph, 1976) (Seamon, 2008).

According to Proshansky, place identity is a component of identity similar to social identity in that it explains how a person interacts with the outside world (Proshansky et

al., 1983; 1987). The concept explains why people feel at home and why either forced or voluntary displacement may be extremely upsetting for both individuals and groups. In this sense, it is asserted that all facets of identity have implications for place (Twigger Ross 1996). Accordingly, the effects of places on identity may be seen as a result of interactions between people and their built environment; individuals have an impact on places, which in turn has an impact on how people view themselves (Hauge, 2007) (Eman El Nachar, 2018).

People's perceptions of a place define their sense of it; they use them to express, think about, and experience it. This perception serves as a metaphor for what makes a place unique. It alludes to the complex link between people and their surroundings and could be read as attachment to a location. This form of relationship takes into account both how humans interact with the natural environment and how human activity has changed the area's constructed environment. From this perspective, it is clear why people are recognized by the locations they call home. The relationship between people and places is transactional, and place becomes a part of who we are and forms our identity because "the sense of place is an experience formed by the setting paired with what a person contributes to it" (Cross, 2001) (Eman El Nachar, 2018).

How can one create a "progressive" sense of place and self in the face of a world that is continuously changing? This is the important question (Cresswell 2004, Horan 2000, Massey 1997). The basic conclusion of Place and Placelessness is that people will always need place because identifying with and belonging to a place are important components of what and who we are as humans, regardless of historical background or geographic, technological, or social circumstances. Place continues to be important and an irrevocable aspect of everyday human life, despite the huge sociological and environmental changes our globe is currently experiencing (Horan 2000). This is not meant to imply that the world must or could return to a collection of independent locations that are all unique, unrelated, and to some extent unaware of one another. Place independence is in many respects impossible in today's globally connected culture (Cresswell 2004, Relph 2000). Additionally, the significance of location and locality must be balanced with knowledge of, connections to, and demands for other places and the world at large (Massey 1997) (Seamon, 2008).

2.8 Place Identity and Built Environment

2.8.1 Place identity Theory

According to "schemata" that Neisser (1976) and Piaget (1954) used to represent perceptions and concepts pertaining to the physical environments, the place identification theory recognized features of spaces and buildings. The first thing that identifies a location is its physical characteristics.

2.8.2 Social Identity Theory

A place is frequently connected to a particular group of people, their way of life, and their social status (Qazim, 2014). Accordingly, physical characteristics of places are connected to social identity in terms of how they affect self-esteem. The construction of a person's social identity is influenced by the knowledge of membership in particular social groups, as well as by the expressed personal feelings and beliefs. The quality of the organizations or entities people belong to or possess—as a positive example—such as nationality, culture, religion, family, neighborhood, and/or others—determines everything (Hauge, 2007).

Both the physical and social characteristics of locations, as symbols that have value for us in the built environment, are significant sources of identity. Wide-ranging knowledge that is associated with one another frames the investigations into place identification. In this sense, gaining a thorough understanding of place identification entails investigating environmental physical characteristics as well as social elements related to psychological urges and functional demands (Eman El Nachar, 2018).

2.9 "Towards a Critical Regionalism: Six Points for an Architecture of Resistance"

2.9.1 Culture and civilization

The potential for developing a diverse urban design has been somewhat constrained by optimized technology and highly standardized business rules. The shortcomings of modernism and postmodernism have begun to become clear as the high rise and motorway become symbols of the metropolitan area. According to Frampton, civilization began with the Enlightenment, which he views as a rational tool, and culture was described as the manifestation and actuality of civilization (Frampton, 1983; Jiang, 2015).

2.9.2 The rise and fall of Avant-Garde

Frampton criticizes the vulgar of postmodern architecture. The Avant-Garde, which was acting a progressive, positive and liberate role has fallen to an embarrassing situation.

2.9.3 Critical regionalism and-World Culture

The distinction between critical regionalism and sentimental historicism is stressed by Frampton. He suggests that critical regionalism should use a systematic, practical, and modern approach to draw out the distinctiveness of the local culture. Critical regionalism could therefore aim to strike a balance between local culture and global civilisation. In order to accomplish this, the design must break free of eclecticism and concrete architecture form. Regional environments including light, geography, context, climate, and tectonic shape should be taken into account in the design. After that, critically take in the advantages of global civilization.

2.9.4 The resistance of the Place – Form

Urban planning, according to Frampton, is universal placeless. He mentions Martin Heidegger's contention that a boundary is not where anything ends but, as the Greeks understood, is where something begins to manifest itself.

2.9.5 Culture Versus Nature: Topography, Context, Climate, Light and Tectonic Form

For critical regionalism, Frampton identifies a few practical design techniques. Contrary to modernism, which favors standardization and mechanization and produced several structures with similar faces, destroying the regional environment. The relation with the site should be taken into account in critical regionalism.

Bulldozing an irregular topography into the a flat site is obviously a technocratic gesture that aspires to a position of complete placelessness, whereas terracing the same land to accept a building's stepped form is an involvement in the job of "cultivating" the site.

Ambience of natural light under the impact of time, season, humidity, etc. guarantee the appearance of a place-conscious form.

The presentation of a structural poetry rather than the re-presentation of a façade is the basic premise of architectural autonomy, notwithstanding the critical significance of topography and light.

2.9.6 The visual Versus the Tactile

Tactile plays a significant role in how architectural form is perceived. A few of the complementary sensory experiences that are perceived by the body include the level of light, darkness, heat, and cold, as well as the feeling of dampness, the aroma of materials, and the presence of stonework. The tactile's significance stems from the fact that it can only be understood in terms of the experience itself. The tactile contrasts with the scenic and the covering of reality's surface with veils.

Frampton uses Saynatsalo Town Hall designed by Alvar Aalto as an example to stress the importance of "tactile". Alvar Aalto created a special experience which is not only visual but also tactile in Saynatsalo Town Hall. This experience prevented a "loss of nearness".

2.10 "Ten Points on Architecture of Regionalism: A Provisional Polemic"

2.10.1 Critical Regionalism and Vernacular Form

The vernacular shouldn't be used to define regionalism. Because architecture should be always critical of vernacular forms and have a role in that consciousness. Critical regionalism should reject the vernacular when it is based on bourgeois aesthetics. "Critical regionalism lies beyond style" (Frampton, 1987; Ozmen, 2019).

2.10.2 The Modern Movement

Both the present and the history are uncertain. Every endeavor affects the future and is affected by the past. "Architecture is culture politics." Attempts at architecture have a variety of effects on people's surroundings, including political and cultural ones. So, while the legacy of the modern movement is extensive, the issue remains as to what awaits us in the future.

2.10.3 The Myth and the Reality of the Region

It is critical to comprehend the realities of the region, such as its location, climate, and so on. Thinking simply in terms of them, on the other hand, leads to erroneous boundaries. Variable sources, such as myths, contribute to deeper thinking about a location in order to gain a better understanding of it. "A myth has the potential to be both critical and creative."

2.10.4 Information and Experience

In everything, according to Frampton, we began to lose our ability to discern between information and experience. It is preceded by the media and its detrimental impacts. It also has an impact on architectural approaches. "Rather than giving oneself to a direct experience of buildings' physical shape, we often read them as picturesque image of structures." He is expressing his dissatisfaction with today's people who are visiting another county, not paying attention to the details and do not experience the environment.

2.10.5 Space/Place

Modern urban growth has become "placeness," losing its sense of place. The relationship is broken by location attachment when only the space is focused on.

2.10.6 Typology/Topography

The term "typology" has connections to both civilization and culture and makes sense in the context of both factors. Topography is a phrase that only applies to one particular location.

2.10.7 Architectonic/Scenographic

Scenography emphasizes on the scene as a representational nature in architecture, whereas architectonics is concerned with the technical support of the structure, myths in structural processes, and the relationship of nature, gravity, climate, and era. “We can easily observe how the present tendency of turning the built environment into scenography or visuals only serves to strengthen an imagistic reception and perception of the built environment.” Architectonic means supporting buildings and having an organized and unified structure that suggests an architectural design. Scenographic is a natural depiction. Sound, light, dress, performance, structure, and space can all be used in scenography to create performance experiences. Frampton attempts to define phrases that appear to be similar at first glance but have deeper meanings and distinctions. Scenographic refers to something that comes from or is inspired by nature. Architectonic, on the other hand, is more artificial term.

2.10.8 Artificial/Natural

Nature's results are not just confined to topography; they also include climate and light. Therefore, architecture should consider its responses. So, the term "artificial" might be understood to refer to a mirror of nature, such as artificial lightning.

2.10.9 Visual/Tactile

Experience is made up of all of your feelings. While visual experience is restricted, tactile experience expands all five senses. But the judgment is made after first seeing it.

2.10.10 Post Modernism and Regionalism

Frampton had a critical view of postmodernism and claimed that it occupies a midway ground between the two. It refers to a conception of the world in which the entire body is viewed as crucial to how it is experienced.

2.11 Characteristics of Critical Regionalism in Modern Architecture

2.11.1 Spatial characteristics

Architecture and the spaces around our buildings and structures are characterized by spatial qualities that produce a sense of atmosphere. Given that this architectural strategy is a response to the existing context, the spatial qualities of critical regionalism are significant. The objective is to further enliven the environment, and that enlivening pertains to the structure as well as the area within and around it, as well as how it links to the other structures around. The strategy aims to enhance the area and integrate it into the surrounding environment. Critical regionalism should serve as a connecting thread to foster a sense of place and a sense of connectedness within a region. Critical regionalism directly combats the modernist movement in architecture's absence of a sense of place. Critical regionalism uses the boundary as a tool to generate space, which in turn creates place (Regionalism, n.d.).

2.11.2 Formal characteristics

Critical regionalism aims to alter the modernist movement's uniformity. During the modernist era, we exchanged concepts and methods, and one result was the practically uniform appearance of our buildings in urban settings. These structures instead turn to their surroundings and draw inspiration from them in an effort to counteract critical regionalism, which draws its inspiration from the local fabric. As previously said, the

goal of critical regionalism is to have new construction blend into its surroundings and integrate with and draw upon its existing infrastructure. Critical regionalism does draw inspiration from modernism in several ways. Function is prioritized over form in critical regionalism, but not to the same degree as in Modernism; buildings may still be designed to execute their function successfully while incorporating certain formal elements from the region's background. It serves as a counterweight to the global influence on architecture and uses local features to fight against the uniformity of the world. Critical regionalism, according to Frampton, may draw inspiration from light, tectonics, or terrain in order to benefit from its setting. We frequently overlook the fact that a building's or a space's tactility also affects how others may perceive them, which is another factor that this school of thought emphasizes.

2.11.3 Tectonic characteristics

Critical regionalism avoids the scenographic aspects of modernism and instead examines the tectonics of structures through their architectural form. Building construction is also given more attention. Critical regionalism makes the building's structure and construction more lyrical. The movement focuses on the tectonics of the conventional and contextual, using these components in fresh ways.

2.11.4 Socio-political characteristics

It is said that architecture is a social art. Architecture must be grounded in its social and cultural context, and critical regionalism offers a solution.

2.11.5 Cultural characteristics

Culture frequently occurs outside of buildings as well as in the spaces between them, thus it does not always take place inside of them. Modernism prioritized movement above place, which prevented culture from existing in cities. Critical regionalism, on the other hand, allows individuals a space to pause and engage in culture; this is one aspect to which the movement responds well. Its physical form demonstrates the other cultural trait to which it responds. The goal of critical regionalism is to reinterpret the local architecture, which itself changes over time and space as culture does.

2.11.6 Technological characteristics

In the case of critical regionalism, technological features of tectonics typically offer a more pragmatic response to the situation. Technology is only employed as necessary in the approach, in an effort to oppose modernism's strong reliance on it.

2.11.7 Process rather than a product

Critical regionalism is a method or process rather than a product, and it varied greatly depending on the circumstances. It had to distinguish between, identify, abstract, and combine regional physical and cultural traits with more universal modern practices, technology, and material and economic conditions. Significant concerns regarding modernity, tradition, cultural identity, and location have been raised by the concept of "critical regionalism" (Eggener, 2002).

The author argues that not every part of Framptom's theory needs to be taken into consideration by citing examples such as Jorn Utzon's Bagsvaerd Church and Tadao Ando's work. In keeping with the contemporary universalized civilization, their works offer a framework for making links to local circumstances and cultural history. In this respect, one may characterize Frampton's critical regionalism as an assimilation process rather than a style.

Frampton outlines how Utzon utilized pre-cast concrete standard parts in the church design and integrated them on site with reinforced shell vaults to create building volumes that evoke a sense of religious monumentality (Frampton 1992, p. 315). The chapel nevertheless has some industrial imagery facing the street that is based on modern materials like concrete walls and aluminum-glass roofing. Despite the church's modular assembly and construction efficiency reflecting the ideas of global culture, Utzon uses the folded concrete shell to allude to Nordic vernacular architecture by reinterpreting the barn form observed in rural Scandinavian landscapes (Frampton 1992, p. 315) (OROZCO, 2011).

Additionally, Frampton offers Tadao Ando's artwork as an example of critical regionalism. According to (Frampton 1992, p. 324), Ando uses the language and methods created by modernism to convey diverse individual lifestyles and regional differences. Despite being geometrically straightforward and abstract, Ando's frequent use of concrete walls to define space gives his structures a more personal and distinctive feel. He emphasizes spatial intricacies within exact geometric forms using the

concrete's surface rather than its mass, creating deep shadows and reflecting light off surfaces to enhance the sense of location (OROZCO, 2011).

Universal modernism, placelessness, regressive populism, and the capitalist culture of consumerism have already been named as the main targets of critical regionalism's critique. However, how did critical regionalism do in relation to the areas it referred to? What exactly makes up a person's cultural (or regional, or national) identity is unclear. How are these to be used and represented? It seems that when addressing the locations where these designs frequently appeared, one architect's interpretation of the locale—Tadao Ando for Japan, Oscar Niemeyer for Brazil, Charles Correa for India, and Luis Barragan for Mexico—was given precedence over all others.

2.12 Phenomenological Discourse

Both architectural theory and practice have employed phenomenological techniques, which have been described as a return to the things themselves (Husserl), a style of seeing (Heidegger), or the core of perception (Merleau-Ponty). Phenomenology, according to Moran (2000, p. 4), is more of a practice than a formal doctrine. Phenomenology is the study of "phenomena," so to speak: The study of the essence of human consciousness through the subjective perception of events is known as phenomenology in architecture. In order to produce an architectural and experiential space, it promotes the inclusion of human sensory and perception in the architectural environment. It is the study of consciousness structures as experienced from the first-person point of view. The reason phenomenology appeals to builders, who see a concrete potential in its more philosophical notions and themes, is likely due to this practical nature. Architectural theorists assert that phenomenology may offer a real, trustworthy method of understanding architecture from a conceptual perspective. They contend that phenomenology can pinpoint an object's or phenomenon's essence and hence may help us get closer to existential being. These theorists have not only created phenomenological methods for interpreting architecture, but they have also, consciously or unconsciously, looked for different standards to judge architectural creations, movements, and styles (Shirazi, 2012).

Phenomenology owes its main thrust to Edmund Husserl and Martin Heidegger, as a philosophical movement. The phenomenological movement in philosophy was started by Husserl with the intention of making it a method of precise philosophical inquiry, or

a comprehensive new "science," but one of his disciples, Heidegger, changed it and turned it into one of the most influential philosophical movements of the 20th century, impacting all subsequent philosophical advancements.

Architect Steven Holl (1996, p. 11) notes that whereas phenomenology is concerned with the study of essences, building has the power to resurrect essences. Architecture can enhance daily life through the numerous phenomena that result from particular sites, programs, and structures by fusing form, space, and light. Heidegger, one of his students, altered it and made it into one of the most significant philosophical movements of the 20th century, having an impact on all subsequent philosophical developments.

The idea of genius loci, idea of zeitgeist, and technology, according to Hartoonian (2012) in his article "Critical Regionalism Reloaded," qualify modern architecture as having regional features. This is because, under the influence of phenomenology, these ideas are what define regional architecture.

Phenomenology has shown that technological theory alone cannot resolve the fundamental issues of architecture by exposing the limitations of mathematical reason. Disillusioned with logical utopias, contemporary architecture now seeks to move past positivistic preconceptions to discover a new philosophical justification in the human world. Its starting point is once more the realm of perception, the ultimate source of existential meaning (Pérez-Gómez 1983, p. 325). These interpretations highlight the significance of phenomenology as a methodology, a method, or an approach by which architectural challenges can be better identified and clarified, despite the fact that their subject emphases are frequently quite different. The argument makes the case that phenomenology provides one route to a more in-depth, thorough understanding of architectural themes and issues (Shirazi, 2012, p. 12).

Christian Norberg-Schulz, a Norwegian architect and phenomenological theorist, underlines that phenomenology is an approach best adapted to delve into the realm of daily experience (Norberg-Schulz 2000, p. 15). He was one of the pioneers in the field of architecture who tried to use this phenomenological approach. Norberg- Schulz promotes phenomenology as a way to comprehend the universe, including the world of architecture, by drawing particularly on Martin Heidegger. According to Eduard Führ, an architectural theorist, phenomenology enables us to comprehend architecture as a

component of our lifeworld, which in turn brings us closer to architectural phenomena. In architecture, Schulz published his phenomenological trilogy, which includes:

1. **Existence, Space and Architecture (1971)**
2. **Genius Loci (1980)**
3. **The Concept of Dwelling (1985)**

In fact, according to Schulz, "a new approach to the problem of architectural space" is being developed, one of which is the notion that architectural space "may be seen as the concretization of environmental schemata or pictures, which are an essential component of man's overall orientation or "being in the world."

1. **Existence, Space and Architecture (1971)**

Qualified space was described as a "existential space" and as a qualitative space by Christian Norberg-Schulz. When it comes to perception and schema, space is existential. Bullnow contends that for a location to possess the characteristics of an existential space, it must express and mirror the person who lives and experiences there. Geography and landscape, urban level, the dwelling, and the thing were Schulz's four categories for "existential space." Piaget also established centers or places (proximity), directions or routes (continuity), and areas or domains in his idea of the schemata of perception (enclosure).

The idea of "architectural space," according to Schulz, has many different forms, but certain modern works, particularly at the level of urbanism, have destroyed its fundamental components. There, architects disregarded the figurative nature of the street and its changes, the prominence of the town square, and its existential function, which resulted in subpar urban environments. Norberg-Schulz went back in time to the colossal architecture of the Parthenon and the medieval towns, which naturally included these elements of "existential space" and created environments that were meaningful and complete. Schulz went back to history in a broader sense to provide examples of comparable structures, communities, and landscapes that innately include these characteristics of "existential space," resulting in meaningful and comprehensive ecosystems. He cites the work of Louis Kahn, Robert Venturi, and Paolo Portoghesi as examples of how understanding of "existential space," which "orthodox modernism" had neglected, had reemerged. Portoghesi had mastered the interaction between

different levels of space through the application of geometry, creating a harmonious relationship between the building and its surroundings (Farah & Mohammad, 2012).

2. Genius Loci (1980)

"Spirit of a place" is a Roman concept that is more specifically concerned with how phenomenology is interpreted in architecture. It was published at a time when post-modernist thinking in architecture gave meaning, history, and mythology a higher profile. It emphasized the interdependence between the created and natural worlds. He maintains that the landscape—not the landscape in general, but certain sanctuaries within the landscape—creates the ideal environment for "intimate habitation." Norberg-Schulz divided landscapes into three fundamental categories. Romantic, Cosmic, and Classical do more than only provide abstract topological conditions; they also seem closely related to specific social or cultural traits, which take the shape of traits that have been historically determined.

Norberg- Schulz concluded that the Modern Movement's fundamental motivation was "profoundly relevant" but "lost of place" in the urban dimension of the modern world. Le Corbusier's Green City and Mies van der Rohe's Federal Center in Chicago as examples, he expressed regret for the Modern Movement's attempts to give form to a "new spirit" with the goal of assisting people in "regaining a true and meaningful existence." Schulz thinks that the second phase of the modern movement, which proposes to "give buildings and places individuality, with regard to space and character," is where the deeply meaningful modern movement was rediscovered. This recovery of place is concretized by the works of Aalto, the late works of Corbusier, Kahn, and the third generation of architects, which includes Utzon, Pietila, Stirling, and Bofill.

3. The Concept of Dwelling (1985)

Norberg-Schulz emphasized the significance of the home as the "primary place of human existence" by citing Heidegger's essay on dwelling and the etymological roots of "building" that stem from "dwelling." He suggested that "figurative architecture" was on the rise. According to reports, Paolo Portoghesi first used the term "figurative architecture" in the late 1970s to describe architectural design from the 1970s, influenced by Graves, Rossi, and others, in which efforts were made to retrieve the obscured meaning of types found in classical architecture, such as walls, columns, door-

cases, pediments, etc., after the Modern Movement had largely discarded them. According to the author's selective interpretation, examples include Mackintosh's Hill House, the vernacular architecture typical of northern European nations, the Hvittrask complex by Gesellius, Lindgren, and Saarinen, Behrens' home in Darmstadt, Hoffmann's Palais Stoclet, and Wright's prairie homes.

Norberg-Schulz criticized modern houses for lacking the "figural quality" and failing to provide a satisfying solution to the housing problem. expressed optimism that the return of this figural aspect, as seen in many post-modern initiatives, will allow for the possibility of habitation once more (Farah & Mohammad, 2012).

The phenomenological method is also emphasized in Frampton's critical regionalism. His concentration on location is a result of his criticism of contemporary placelessness. He berates architects for their failure to design spaces in modern culture. This comprehension of the city, the neighborhood, and the setting is fundamentally important to Frampton. He contends that the rush metropolis created by this non-place metropolitan reality leaves little room for actual locations. He contends that a return to place and bounds is crucial in light of the non-place urban realm's undisputed victory. He talks of a dedication to a location rather than to space. According to him, architecture may only exist in certain dimensions when viewed from a distance; yet, direct physical contact and tactfulness can greatly enhance the experience. When vision takes precedence over other senses, perception is reduced to being merely informational, representational, or to the straightforward conjuring of a phantom that stands in for absent presences (Frampton 2002a, 89). The loss of nearness results from this flat, or what Frampton refers to as "far," sensation. The two concepts of site and tactility give Frampton's conception of architecture a phenomenological undertone. Edward Relph, a phenomenological geographer, emphasizes the necessity of striking a balance between pressures of globalization and placelessness and the preservation of a sense of place, identity, and community (Shirazi, 2013).

2.13 Sustainability paradigm

Elahe, Zoghi and Hoseini (2018) argues that critical regionalist architecture has entered a new stage in its evolutionary process. The sustainability paradigm has been introduced alongside a new trend in regionalist architecture. Environmental and ecological issues have also received significant attention from regionalism. Planning and design theories,

which are drawn from concepts of sustainable regionalism, theories of natural regionalism, and theories of critical regionalism, are an acceptable response to the universalization and ever-expanding metropolitan world. The identity, and consequently the cultural and natural landscape, can be significantly influenced through sustainable living and evolutionary adaptation. This effect has beneficial associations with both tourism and economic development. Doroteo (2016) also maintains that, if Critical Regionalism had to be described, it would really resemble environmentally friendly, sustainable design. The approach Frampton suggests—embracing the surroundings—is sensible and ought to be used. It makes the case against copying the past and warns against totally embracing the future. that instead, we should handle the situation as it is. the current environment and situation.

A notion called regionalism holds that the life cycle of a building is greatly influenced by the climate, geography, indigenous language, and location. The finest design in response to sustainability should be achieved now using these responsibilities as tools. By utilizing design techniques, materials, energy, and development places that are not harmful to the local ecology or community, this idea addresses the negative environmental and social implications of structure. The goal is to uphold the principles of social, economic, and ecological sustainability in architectural practice and to make sure that the decisions made today don't have a negative impact on future generations. This architectural idea is critically confronting the past, present, and future of the area (Elahe Zoghi Hoseini, 2018).

2.14 Major Findings

Table 2.1: Major findings from literatures

Paper Title	Author's name	Published year	Main Findings
Place and Placelessness, Edward Relph	David Seamon & Jacob Sowers	2008	• the importance of place to the human experience • Without a thorough grasp of the richness and complexity of place as it is experienced and created by real people in real

Paper Title	Author's name	Published year	Main Findings
			places, how could one study place attachment, sense of place, or place identity? • Depth of place>> Relph focuses on how people identify with and relate to place. • Identity of place>> "constant uniformity and oneness that sets that [location] apart from others" >> 3 components 1. the place's physical setting 2. its activities, situations, and events 3. meanings created through people's experiences • Identity with place>> the idea of insideness, which refers to the level of attachment, participation, and care that an individual or group has for a specific location. • Diverse places assume different identities for various people and groups through different combinations and intensities of outsideness and insideness, and human experience adopts various dimensions of feeling, meaning, ambiance, and action towards place.

Paper Title	Author's name	Published year	Main Findings
			• According to Relph, a genuine sense of place is gradually being replaced by a less genuine attitude he called placelessness in our modern age. He describes this as "the casual elimination of distinctive places and the making of normalized landscapes that outcome from an insensitivity to the importance of place."
Towards a Critical Regionalism: Six points for an Architecture of Resistance	Kenneth Frampton	1983	• There is the conundrum of how to advance modernity while going back to the roots; how to resurrect a long-dead civilization while participating in the global civilization. • The universalization phenomenon led to the subtly eradicating of traditional culture. • Technology has completely optimized and conditioned modern architecture and culture. • Critical regionalism, which can be defined as "mediating the impact of global civilisation with aspects obtained tangentially from the characteristics or a particular place."

Paper Title	Author's name	Published year	Main Findings
			• In order to oppose "placelessness" and the universal, Kenneth Frampton's "architecture of resistance" emphasizes local site and environmental factors including light, topography, context, and climate.
Ten Points on Architecture of Regionalism: A Provisional Polemic	Kenneth Frampton	1987	• The vernacular should not be used to define regionalism. Because architecture should be always critical of vernacular forms and have a role in that consciousness. • Past actions have an impact on present actions and vice versa. Politics of culture is architecture. • The region's reality, including geography, climate, and other factors, is crucial. It also includes flexible sources with loose bounds, such myth (culture). A myth can inspire critical thought and invention. • Living in the moment rather than viewing structures as pretty photographs. • Modern urban development has become "placeness," losing its sense of

Paper Title	Author's name	Published year	Main Findings
			place. The relationship is broken by location attachment when only the space is focused on. • Typology - related to both civilization and culture whereas Topography - specific site that is in nature. • The term "architectonic" is more contrived. similar to the representational character of architecture, scenography focuses on the scene. • When designing buildings, architects should consider factors like topography, light, and climate. One could consider artificial to be a subset of nature. • Visual experience is limited, however tactile experience expands all senses. A "loss of nearness" was prevented by tactile experience. • Critical regionalism, which occupies a midway ground between postmodernism and modernism. It is a conception of the environment in which the entire body is viewed as crucial to how it is experienced.

Paper Title	Author's name	Published year	Main Findings
Literature review of Kenneth Frampton	Jan Doroteo	2016	• Critical regionalism and regionalism are not the same thing. • Critical regionalism is viewed as a form of post-modern approach to architecture, whereas regionalism is more of a response to and nearly a replication of the previously existing local setting. • Although society can easily become either archaic or modernist, the neutral becomes a source of (Lambrecht) tension. • Critical regionalism cautions against blindly adopting the future and urges caution when copying the past. • We should deal with the situation as it is. the current environment and situation.
Placing Resistance: A Critique of Critical Regionalism	Keith L. Eggener	2002	• Critical regionalism had to distinguish between, identify, abstract, and combine regional physical and cultural traits with more pervasive modern practices, technologies, and material and economic conditions. • It is a method or process rather than a product.

Paper Title	Author's name	Published year	Main Findings
			• What aspects of cultural (or regional, or national) identity make up each? How are these to be used and represented? • Critics - It seems that when considering the locations where these designs first debuted, Tadao Ando for Japan, Oscar Niemeyer for Brazil, Charles Correa for India, and Luis Barragan for Mexico, one architect's perception of the region was stressed over all others.
Critical Regionalism Reloaded	Gevork Hartoonian	2012	• Including novel phenomenological and environmental concepts has become fashionable. • Qualifying modern architecture as having regional features - Under the influence of phenomenology, the ideas of genius loci, zeitgeist, and technology are the main factors that define regional architecture. • According to Lewis Mumford, an architectural form must also be timely in order to be considered genuine.

Paper Title	Author's name	Published year	Main Findings
			• The terrain's relationship with the architecture should be natural. The organic by Frank Lloyd Wright is praised for its role in establishing his nation's New Tradition.
Christian Norberg-Schulz and the Existential Space & On Phenomenological Discourse in Architecture	Farah, Habib Mohammad, Khosro Sahhaf Sayyed & M. Reza Shirazi	2012	• Investigating the fundamental nature of human awareness using one's own perception of phenomena >> emphasizes the incorporation of human sensory and experience into built form to produce an architectural and immersive space from the first-person point of view. • Phenomenology is the study of essences, and by weaving together form, space, and light, architecture has the power to restore essences to existence. Architecture can also improve the quality of daily life through the various phenomena that result from particular sites, programs, and architectural designs. • The fundamental issues in architecture cannot be resolved by technological theory alone; once more, its starting point is the field of vision.

Paper Title	Author's name	Published year	Main Findings
			• Christian Norberg-Schulz >> With perception and schemata, space is existential >> should convey and represent the individual experiencing and living in it. • Four levels >>geography and landscape, urban level, the house and the thing • Genius Loci – Spirit of place >> emphasizes the interconnection of the natural and made worlds >> also linked to certain social or cultural traits, which take the shape of traits that have been historically determined. • The works of Aalto, Corbusier's later creations, and third-generation architects Utzon, Pietila, Stirling, and Bofill represented a deeply relevant second phase that was once again being rediscovered. • Revival of Figural quality >> aims to restore the muddled meaning of traditional architectural typology >> make meaningful architectural and sensory environments

Paper Title	Author's name	Published year	Main Findings
			• Place and tactility are two concepts that give Frampton's perspective on architecture a phenomenological edge. Edward Relph, a phenomenological geographer, emphasizes the necessity of striking a balance between pressures of globalization and placelessness and the preservation of a sense of place, identity, and community (Shirazi 2013).
An account of critical regionalism in diverse building types in post-colonial Indian architecture	Sanyam Bahga, Gaurav Raheja	2018	• Evaluation standards for identifying regionalist construction projects in India: ▪ Context-specific Architecture ▪ Historical Knowledge ▪ Climate Responsiveness ▪ Materiality ▪ Ecology and Landscape ▪ Social and Cultural Appropriateness ▪ Technology
New Trends in Critical Regionalism through the Lens	Elahe Zoghi Hoseini, Darab Diba, Hamed	2019	• Displays architecture that is more environmentally responsible and sustainable.

Paper Title	Author's name	Published year	Main Findings
of Tzonis and Lefaivre	Kamelnia, Mostafa Mokhtabad		• Actively involved in ecological and environmental issues. • Deeply concerned with ecological and environmental issues. Reasonable response to universalization and the ever-expanding metropolitan world. • Sustainable living and evolutionary adaptability have a significant impact on identity, which in turn affects the cultural and environmental landscape. • Promotes favorable economic development, including tourism.
A comparative analysis of Kenneth Frampton's critical regionalism and William J. R. Curtis's authentic regionalism as a means for evaluating two houses by	Juan Carlos Orozco	2011	• Frampton's critical regionalism, which is an absorption process rather than a fashion statement. The author argues that not every part of Framptom's theory needs to be taken into consideration by citing examples such as Jorn Utzon's Bagsvaerd Church and Tadao Ando's work. • William J. R. Curtis urges that tradition be viewed as a product of social structure and

Paper Title	Author's name	Published year	Main Findings
Mexican architect Luis Barragan			cultural evolution that must be felt in the physical environment. • According to Kenneth Frampton, the importance of tradition in the built environment is not only ingrained in its architectural history and culture but also in the recognition of the unique characteristics of site and climate, to which critical regionalism aims to produce a suitable response. • By faking regionalism, concrete and glass boxes with a few traditional features pasted on top were created by combining local and imported qualities. If we are to combine modernity and tradition, the meanings must originate from the real societal fundamental principles. • While some vernacular forms are taken into consideration, their translation into contemporary architectural vocabulary falls short.
Regionalism and Nepalese Architecture	Ranjan Singh Shah	1985	• Geographical and climatic condition>> major factor for influence in development of architectural style.

Paper Title	Author's name	Published year	Main Findings
			• Technology should always be implemented in a way that satisfies our local or regional needs. • Though socio-cultural tradition and behavior are portrayed considerably differently, architectural conceptions derived from the perspective of the climate are nearly comparable. • Sherpa villages in Khumbu>>Harsh climate and environment>>Definite link existing between the scattered groups of houses>>given rise to social integration • Kathmandu valley>>very rich in culture, art and architecture>>Religious Harmony between Hinduism and Buddhism>>Religious Town • Religious and rich cultural impact >> a significant element in the development of an advanced level of urban culture that is relatively unique. • Settlement>> dwellings that are closely spaced apart, composed of clay bricks that have been burned and unburnt, and have

Paper Title	Author's name	Published year	Main Findings
			narrow roadways and small courtyards. • Compact settlement>> great desire to protect fertile agricultural land • Water bodies>> utilitarian, aesthetic, spiritual, and environmental significance Today's context>> Investigate our needs first, then create concepts that are appropriate for our sociocultural and financial context.
An approach to the design of housing for Kathmandu, Nepal	Ambika P. Adhikari	1987	• "A supportive environment exists when the environment and lifestyles are in harmony." (Rappoport, 1979) holds true in the predominantly traditional areas of Kathmandu Problems with indigenous systems • Spatially: ➢ Traditional housing has considerable horizontal extension potential but limited vertical flexibility. • Technically:

Paper Title	Author's name	Published year	Main Findings
			➢ Except for the insulation provided by the adobe, brick walls, mud, and tiled roof, there is essentially no interior thermal regulation. ➢ Solar control factors, such as the best fit orientation, are not included. ➢ The traditional housing is quite weak, especially in the areas of sanitation, damp proofing, water supply, and sewage.
Expression of cultural identity in the contemporary urban built form of Kathmandu	Brinda Shrestha	2018	• Finding the identity of developing cities can be difficult since, on the one hand, there must be a connection to the city's past and its residents, and, on the other, the changes in the city must be compatible with contemporary ideas. • Changes in residential built form of Kathmandu 1. In urban core ➢ Interventions conducted in brick and concrete works by adding levels ➢ Converting sloping roofs to terraces that are flat

Paper Title	Author's name	Published year	Main Findings
			➢ Houses are divided vertically as a result of property division. ➢ Floor levels typically increased from three to five or more stories. ➢ The standard 7-foot floor height was replaced with a 9-foot height. ➢ The use of reinforced concrete as a method for building structures. ➢ Use of large glass openings ➢ In place of individual family households, several rental households now make up the functional dynamics of homes. ➢ Built shapes are motivated by the practical requirements of economic changes. 2. In the outer area ➢ Unplanned sites and infrastructure development ➢ The characteristics of a "residential neighborhood" include a strong feeling of place, ample opportunities for social interaction, a

Paper Title	Author's name	Published year	Main Findings
			cohesive community, and efficient physical planning that takes into account local ambitions. Planned residential developments plainly lack these characteristics.

Table 2.2: Comparative building technology in two system

Source: Adhikari, 1987

	Indigenous		**Industrial**
Design	Historical type, sometimes repetitive	Time	International, Universally western type
		Need for today in Kathmandu	
Construction and materials	Mud, thatch, adobe, etc Unchanging details	Time	RCC, Precast element, high techniology

Table 2.3: Silent features of two systems adopted in designing dwellings for Kathmandu

Source: Adhikari, 1987

	Site planning and design				**Construction**	**Material**	**Aesthetic**
	Size	**Pattern**	**Configuration**	**Standards**			
Indigenous system	Intimate, small	Extended from traditional pattern	Pertaining to traditional	Extended from the existing	Construction technique is outstanding overall.	Native materials whenever possible	Adapt aesthetics from conventional shapes using necessary materials, methods, etc.
	Keep the area's layout such that it is psychologically familiar to the inhabitants.						
Industrial system	Improvements should be made based on solar factors and other scientific methods.				Add improvements and novel ideas to fundamental flaws	Utilize effective materials in the homes' interiors.	

CHAPTER 3. RESEARCH METHODOLOGY

Since the research is located within a pragmatic paradigm, a mixed method of logical argumentation and qualitative approach will be suitable to obtain knowledge. “Broad explanatory theories must be framed in order to use logic as a defense. This approach starts with a basic premise that is self-evident enough to not require any further fundamental justifications. The First Principle is what it is called. Therefore, first principles are logical building blocks that can be used to create or build vast explanatory theories” (Groat & Wang, 2013, p. 379). An argument is a logical, highly developed statement or statement offering support for a claim. A well-documented thing is attempted to be positioned within a methodical framework that explains the thing through logical argumentation. Logical argumentation itself is a discursive method. Accordingly, in this research, the first thing to do is to explore and collect data from literature and observation of works from the post-50s by foreign architects in Kathmandu. From these, 2 sets of data can be derived to formulate propositions on what attributes of critical regionalism should be there in Kathmandu’s case.

Subsequently, the research also seeks a qualitative approach to obtain valid knowledge. “The main focus of qualitative research is multi-method, with an interpretive, naturalistic approach to its subject. In their studies of phenomena in their natural environments, qualitative researchers try to understand or interpret phenomena in terms of the meanings that people assign to them” (Groat & Wang, 2013, p. 218). Accordingly, this research requires interactive interviews, questionnaires as well as a focused group long interviews with key informants knowledgeable people to create intellectual opinions. So, these 2 methodologies will be the most appropriate strategy to carry out this research.

3.1 Research Paradigm

Since the nature of the research topic is more of an exploratory type and deals with socio-cultural aspects of human behavior, it requires logical argumentation as well as a qualitative approach. So, the research will be based on two paradigms: Constructivist and Critical Theory. Hence it is located within a pragmatic paradigm and uses a mixed method for the investigation.

The research topic mostly focuses on the architectural trend that has to be adopted in the context of Kathmandu. It tends to highlight mostly contextual, socio-cultural, social,

qualitative aspects and make logical arguments. The ontological claim of this research is:

"In the name of modernization and development, Kathmandu is haphazardly embracing western trends that have adversely affected the local contextual architecture, art, craft, culture, and environment."

Epistemologically, the research needs to look upon the various aspects such as socio-cultural, material, technological, political, environmental, etc. to prove ontology. This research needs a rigorous review of the literature, a field study of the past architectural works, and an argument-based qualitative approach to obtain a valid source of knowledge about critical regionalism in the Kathmandu valley.

3.2 Theoretical and conceptual framework

The theoretical framework is a framework that is based on an established theory in an area of study and/or reflects the study's hypothesis. "The theoretical framework has a number of advantages for research projects. It provides the framework for demonstrating how a researcher defines his or her research in terms of philosophy, epistemology, methodology, and analytical approach (Grant & Osanloo, 2014). According to Ravitch and Carl (2016), the theoretical framework serves as a framework for researchers to situate and contextualize formal theories into their studies" (Hussein, 2018, p 438).

In this research problem, several key concepts need to be explored. This includes key theories related to place & placelessness, Kenneth Frampton's Critical Regionalism, regionalism, space & place, phenomenological discourse in architecture, and other social, cultural, environmental theories.

A thorough literature review was then conducted to compare and critically evaluate the approaches proposed by various authors, as well as how other researchers defined and elicited relationships between these important concepts. Pay attention to the various variables of critical regionalism derived from the literature, the most relevant variables have been examined in selected international case studies, and these variables are also relevant in the national context. These theories as to the basis for interpreting and understanding the data. It is used to determine whether a project criticizes or evaluates an established theory.

Subsequently, the qualitative approach in this research requires interactive interviews, questionnaires as well as a focused group long interviews with key informants knowledgeable people to create intellectual opinions. A framework that combines the individual perspectives to look further to understand the views about modern architecture in the context of Kathmandu among the participants is needed. Therefore, qualitative analysis with participant interviews and focused group long interviews will be done using open-ended questions as a guideline for fulfilling the research purpose.

3.3 Method

3.3.1 Case study design

Since the type of research is issue based and deals with problem identification, instrumental case study needed to be done, taking two or more cases. “The case study technique "investigates a real-world, current bounded system (a case) or many bounded systems (cases) over time, using thorough, in-depth data collecting involving multiple sources of information... and provides a case summary and case themes” (Creswell, 2013, p. 97). An instrumental case study is one that examines a case (such as a person, special group, occupation, department, or organization) in order to shed light on a specific problem, reevaluate generalizations, or develop a theory (Mills, Durepos, & Wiebe, 2010).

Components of case study research design:

1. **Research question:**

The case study was designed, based upon the main research question: **“What are the regional architectural attributes of valley, that can form the basis of modern architecture???”**

2. **Proposition:**

Based on theories, following are the regional attributes, that can form the basis of contextual modern architecture.

- Light
- Typology
- Topography
- Context
- Climate

- Tactile experience
- Historical Knowledge
- Materiality
- Social and Cultural Appropriateness
- Technology

These parameters extracted from theoretical realm are looked upon the selected international case. Saynatsalo Town Hall by Alvar Aalto is taken as case. In his essay, Kenneth Frampton listed Aalto's Saynatsalo Town Hall as an example of 20th-century critical regionalist architecture (Elengical, 2022).

3. **Unit of analysis:**

In Nepali context, Modern architecture can be defined according to the principle of regionalism, characterized by:

- Climate
- Spatial attributes
- Material

These three parameters are selected to determine whether the selected cases criticize or evaluate an established theory. Two cases are taken.

- **Case 1: Dhakhwa house:** A restored old Newari House in the historical center of Patan, with top floor loft as homestay. The house is nested in a courtyard nearby Nagbahal, the Golden Temple and Patan Durbar Square. The neighborhood is very authentic and traditional.
- **Case 2: Taragaon complex:** An early modern building in the valley located in the northern part of the city near the Bouddh stupa, in which visitors from the West could be housed for some time. Today, functions as museum.

4. **Data linking:**

The process of pattern matching compares an observable empirical pattern to a theoretical pattern that has been predicted. In "mixed-methods" research, where qualitative and quantitative data-collection and analysis methodologies are classified as either complementary or sequential triangulation, the pattern-matching technique employed in case-study projects has similarities to the more well-known "many methods" research (Teddlie & Tashakkori, 2009).

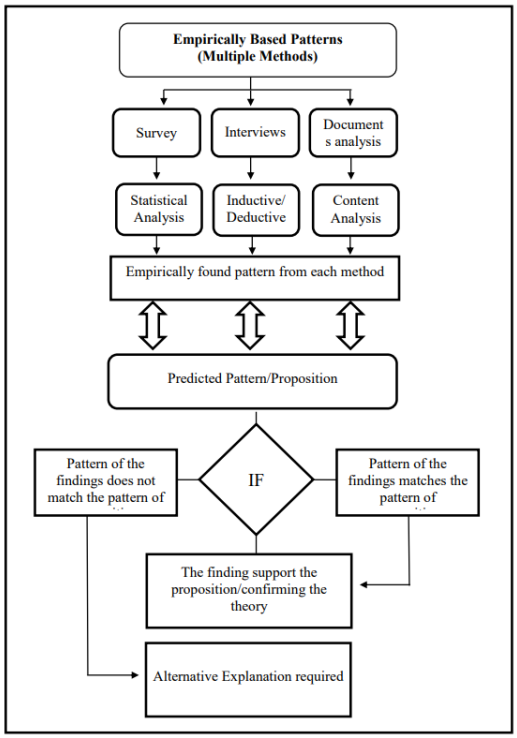


Figure 3.1: Illustration of the pattern matching process

Source: eprints.qut.edu.au/64761/1/nhs-paper.pdf

5. **Explanation:**

The goal is to develop answers on whether and why the patterns are matched or not, which ultimately results in better validity and supports or modifies the theory or conceptual framework underlying the investigation, rather than to confirm or refute the thesis itself.

3.3.2 Interview

A qualitative data gathering technique called in-depth interviews involves face-to-face, one-on-one interaction with each participant. It has the potential to be so insightful; fast identification of extremely useful findings is feasible. So, interactive interviews with minimum 5 key informants knowledgeable people to create intellectual opinions will be carried out. A framework that combines the individual perspectives to look further to understand the views about modern architecture in the context of Kathmandu. among the participants is needed.

Some sample questions are:

- Especially focucing on works of Carl Prucha's in Kathmandu (CEDA and Taragaon), do you think his buildings are regionally specific for Kathmandu?
- Do you see Prucha's personal language (that he developed out of his experience in Kathmandu valley) also responded to socio-cultural aspect of Valley?
- Do you think Prucha's material choice i.e. Brick reflects local context in these days also? Or, should we go for new materials instead of brick?
- In your view, while designing building in Kathmandu; do climate responsiveness should be taken care off?

CHAPTER 4. CONTEXT OF STUDY

4.1 Modern architectural development in Kathmandu

Nepal is a nation with a long history that is multi-ethnic and multicultural. When discussing the history of Nepalese architecture, it is evident that the country's inhabitants are the reason why it is so rich and colorful. The nation has more than 102 dialects spoken, and there are more than 100 different ethnic groups dispersed throughout. This indicates that cultural differences in architecture are significant. The scenery of this nation is also highly colorful; the lowest points are 250 meters above sea level, while the highest points reach Mount Everest, the highest point on Earth. This implies that architectural styles vary according on geography and climate.

Over the course of its evolution, the Kathmandu Valley, which has a history dating back over two thousand years, has continued to be a significant metropolitan center in the area. Several dynasties, including the Lichchhavi and Malla kings, ruled the valley during the ancient and medieval ages (Hutt, 1994). More than 600 years and the Shah invasion in the latter half of the year 1700 AD marked the end of the Malla Dynasties' golden period in Nepalese traditional architecture.

Newari architecture, which was created by Malla rulers, plays a significant role in defining Nepalese traditional architecture to the outside world because it has a strong cultural foundation. There were three separate Durbar Squares in Kathmandu during the Malla era, which is when Kathmandu's architectural expression reached its pinnacle in terms of history. That would be the Durbar Squares at Bhaktapur, Patan, and Kathmandu. Although this era also had some impact on Shikara architecture, which may be seen in Patan's Krishna Mandir. But in terms of Pagoda architecture, this era could offer us a really unique architectural statement. The pagoda shape is highly attractive; it usually begins with a square base and rests atop a pedestal. As it rises, the Pagoda shape gets smaller until it reaches its peak. This represents the relationship with God in heaven, which has many similarities to a mountain. The workmanship in the form of wood or metal, which can be seen in the Pagoda's overhang or in the façade's details at the entrance levels, makes up the remaining components of this architectural statement. Therefore, these few fundamental shapes provide a very distinctive heritage (or, perhaps more accurately, the expression of Nepalese architecture) that still inspires a great deal of passion and conveys a sense of maturity when we consider the people,

artisans, and considerateness of the emperors who ruled the nation at that time (Bhattarai, 2012).

The valley became the capital of the broader Nepal after Prithvi Narayan Shah conquered the towns in the valley from the Malla kings in 1769. Traditional Valley architecture was in vogue up until that point. The Malla architectural style appears to have persisted into the late 18th century. A few modifications were made, such as when the palace towers in Basantapur and Nuwakot were built. Beginning to emerge were regional influences from nearby areas. Therefore, it may be claimed that "Early modern architecture" eventually arose from post-Malla architecture. However, it wasn't until the early 19th century that a whole new architectural language was developed. An totally new architectural style was found as Nepal expanded, especially in the western Himalayas. This appears to have been viewed as a potential way for the rulers, including Bhimsen Thapa but also other generals, to adopt a foreign architectural style that set them apart from the local identity (Nepal, 2020).

However, the Shah's control came to an end in 1845 when Nepal was placed under the de facto rule of the Rana Prime Minister (104 years), who held political power. It was a time of seclusion from the outside world and strict restrictions on who may enter the valley, both Nepalese and foreigners (B. Shah & Pant, 2005). Even though the British did not occupy Nepal, the Ranas promoted European Neo-Classical architecture, which evolved into early modern buildings and spread throughout the valley. The two leading engineers at the time were Kishor and Kumar Narsingh Rana. In 1951, the Shah rulers were reinstated to the throne, introducing democracy to the nation and ending the period of imprisonment. As a result, Nepal became more open to contemporary development. Nepal embraced modernism at a time when the west was growing tired of uniform modernity.

The Sarashwati Sadan, a significant building in the history of modern architecture in Nepal, was constructed around the time that modern architecture in Nepal officially began. It was created by Bed Prasad Lohani, who was responsible for introducing concrete buildings in Nepal. Another illustration is Ranjana Hall (2009 B.S.). In his structures, he experimented with several elements like domes, RCCs, and RBCs. His constructions are uncomplicated, useful, and structurally sound. Prabhinga Man Singh Pradhan, Shankar Nath Rimal (a civil engineer who graduated from Calcutta University in 1957), Ganga Dhar Bhatta (the first Nepali architect who received a B. Arch degree

from India in 1961), and Bhubaneswor Lal Shrestha are other people who have made significant contributions to the growth of modern architecture in Nepal.

The classic pagoda temples' pyramidal roofs served as the inspiration for the new architectural form. The mandapa constructed in 1956 for King Mahendra's coronation was the first allocation. Although there is little written evidence of the outside pavilion, it is not surprising that the King, who wanted to appear to be endowed by God, imitated the religious jargon. The pyramidal roof quickly extended into contemporary Nepalese architecture, displacing temples as the dominant architectural feature. One of the first Western architects to arrive in Kathmandu, Robert Weise, adopted the roof as his personal trademark and included it into all of his works. Armed forces barracks (Army Headquarters), hotels (Hotel Annapurna, Fishtail Lodge, Hotel Yellow Pagoda), and libraries (Gandhi Bhavan Library) were all crowned with a distinct pyramidal silhouette (Lauzon, n.d.).

The façade of Nepalese buildings from the 1950s and 1960s frequently featured a whitewash, which was both a continuation of the Rana regime's earlier neoclassical palaces and a lingering hallmark of early Modernism that was well-known to foreign architects. This preference started to shift in the early 1970s when historical preservation and urban redevelopment initiatives brought brickwork back into the public consciousness. The Bhaktapur Development Project, funded by West Germany between 1974 and 1986, was one such significant endeavor. The effort was later abandoned due to scope creep and entanglements in local politics, although it was successful in boosting tourism and emphasizing Nepal's masonic legacy (Lauzon, n.d.).

Hence, the modern architectural development in Kathmandu can be chronologically categorize into four periods:

Table 4.1: Modern architecture timeline in Kathmandu

Category -1	**Category -2**	**Category -3**	**Category -4**
Early 19th century defined by the introduction of Islamic elements	The late-19th up to mid-20th century defined mainly by European	The early modern buildings which would	The contemporary era focusing mainly on 1970s and 1980s but could include more

Category -1	Category -2	Category -3	Category -4
during the Shah period. This was largely defined by Bhimsen Thapa and the various buildings built during his reign as Prime Minister.	neoclassical styles. These were introduced by the Rana Prime Ministers and are often called Rana Style buildings.	span from the 1940s to the 1960s, largely defined by the early use of reinforced cement concrete.	recent buildings if considered to be representative of the period, of outstanding quality and influencing the architecture field. This would include the designs of international and national Masters.

Category -1

1. **Kirtipur Tower (late 1770s) -** Hanumandhoka Palace, Kathmandu

Kirtipur Tower is a unique pavilion on the fifth floor and north-west corner of the building encompassing Lohan Chowk, part of the Hanumandhoka Palace complex. The tower architecture was introduced to Nepal after Prithvi Narayan Shah's victory over Kathmandu Valley.

Figure 4.2: Kirtipur Tower with Bangla roof style, 1973
Source: (Nepal, 2020)

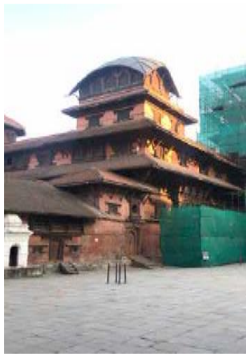


Figure 4.1: View of Kirtipur Tower from Nasal Chowk, 2019
Source: (Nepal, 2020)

Modern approach:

- The pavilion exhibits the complex roof form of Indo-Islamic Architecture which carefully merges with traditional timber technology of Kathmandu Valley - **Cultural Harmony.**
- Its uniqueness lies in its curvilinear roof form borrowed from a Bangla roof style and it is said to have been constructed by craftsmen from Kirtipur. Timber rafters and purlins were crafted into curved pieces for the frame of the roof structure. - **Experimentation with form.**
- The roof rests on the timber structure provided with arched windows and traditional lattice. The intricate carving technique in wood was a traditional skill developed in Kathmandu Valley, however, the use of the motif of images of peacock and snakes in the struts signifies the adaptation of foreign motifs, mainly Persian and Islamic, during this period – **Respect for historic knowledge.**

Figure 4.4: Wooden frame structure supporting the roof, 2017
Source: (Nepal, 2020)

Figure 4.3: Decorative struts with snake motif supporting curve roof, 2019
Source: (Nepal, 2020)

2. **Baithak of Paltan Ghar (1777- to be confirmed)** - Ason, Kathmandu

At first glance, the Paltan Ghar in Asan appears to be just another fascinating historical structure in the Valley that need urgent maintenance. Hugging one of the six alleyways that lead to Asan Chowk, this avant-garde 240-year-old structure may have been one of the most famous parts of ancient Kathmandu if it weren't covered in dust or hidden by the brass pots that adorn its walls. It was the residence of Kaji Abhiman Singh Basnyat, one of the prominent Commander-in-Chiefs of Unified Nepal army —following the sacking of Kathmandu in 1768. This two-storey building on the main street used to lead to seven connected courtyards among which only three are accessible today. The front building used to serve as a bhaithak area where national and international delegates used to meet, and the inner houses were living quarters.

Modern approach:

- Amalgamation of both Mughal and Newari styles of architecture in this building complex which showcases a unique character within the streetscape - **Cultural Harmony.**
- The mural of miniature soldiers on the frieze displays military power and its importance to the national defence during 18th century Nepal – **Ornamentation as per building function.**
- The opulent Baithak in this edifice, which was finished in 1777, was decorated with seven stained-glass windows that were designed in the Mughal style, making it the first private dwelling in the nation– **Glass, new material in fenestration**.

Figure 4.5: Street facade with the long windows of the Hall and shops on the ground floor. *Guruju Paltan* marching during Seto Macchinra Jatra

Source: A Postcard from Paltan Ghar (kathmandupost.com)

Figure 4.6: The elaborate decoration on the window posts and bracket and unique army parade

Source: (Nepal, 2020)

3. **Bahadur Shah hall (1790s)** - Patan Durbar, Lalitpur

Following his return from Benares, the regent Bahadur Shah built the Bahadur Shah Hall structure in the northern part of Patan Durbar. For the majority of the 19th century, the structure served as an arsenal. It was home to the Earthquake Loan Branch after the 1934 earthquake, a neighborhood office tasked with lending money to those impacted by the disaster. Adarsha Kanya Niketan Girl's School leased it in 1973.

Modern approach:

- The design was influenced by the Anglo-Indian style already prevailing in India at that time - **Cultural Harmony.**
- The rectangular structure has two lower storeys above a towering reception area (baithak). The Bahadur Shah Hall is the first structure of its kind in the nation because of the reception hall's expansive interior space, high ceilings, and fireplace, which differ drastically from all interior spaces from earlier times – **Building scale as per function.**
- Regularized fenestration controls the façade's design, with a two-story high gate in the middle allowing elephants to access the stables in the backyard – **Addressing functional need.**
- The long projecting wooden balcony along the hall – **In contrast to overhang with slope in traditional architecture.**
- The wooden beams on ceiling of hall are supported by the projecting brackets (Reinterpretation of brackets of traditional *Tham* as structural element) - **Respect for historic knowledge.**

Figure 4.7: Front facade of Bahadur Shah Hall building (The long projecting wooden balcony along the hall and two-storey high gate at the center to allow elephants to enter)
Source: (Nepal, 2020)

Figure 4.8: The Bahadur Shah hall (wooden beams, supported by the projecting brackets)
Source: (Nepal, 2020)

4. **Chhauni Durbar (National Museum) (1819) -** Chhauni, Kathmandu

Chhauni Durbar is one of the only existing palace complexes built by Bhimsen Thapa. The building served as an arsenal and the top floor was used as a private retreat from the city. Later Bir Shumsher used it as a private museum for weapons and guns and was turned into Chhauni museum by Chandra Shamsher.

Modern approach:

- The symmetry prevailing in the traditional architecture of the Kathmandu Valley has been retained on its façade, however, at the time; the scale of the building completely changed the skyline – **Contrasting building scale with traditional architecture.**
- On the main facade the traditional three-bay windows flank the central French windows that are separated by Corinthian columns. The elaborate use of the ogee arches, column pilasters on the facade and use of round wooden columns dominating the façade, indicate the change in the architectural style prevailing in palaces during the early 19th century Nepal – **New architectural form in contrast to Traditional Malla palaces.**

Figure 4.10: Front facade of Chhauni Durbar with arched french windows and corithian column, 1975
Source: (Nepal, 2020)

Figure 4.9: Chhauni museum
Source: https://www.wondersofnepal.com/national-museum-chhauni/

5. **Dhukuti(1820s) -** Hanumandhoka Palace, Kathmandu

Dhukuti, the old Royal Treasury building within the premises of Hanumandhoka Palace complex is built around two courtyards with a single opening on theexterior façade, which is the main entrance door.

Modern approach:

- The facade towards the courtyard reflects the influence of Mughal architecture with the use of cusped arches and pilasters in the openings - **Cultural Harmony**
- The building is significant for its vaulted roof supported by massive 1.5-meter-thick brick masonry walls. Suspended flooring has been provided with air vent ducts - **New roof form.**
- The interior spaces are slightly illuminated by natural light using stone lattice windows. For security the wooden doors are provided with metal straps/nails and the door jambs, lintels and threshold are made of stone – **Material use as per building function.**

Figure 4.13: Panaromic view of one of the courtyards in Dhukuti, 2019

Source: (Nepal, 2020)

Figure 4.11: The stone jamb, lintel and threshold for the doors along with cusped arch and pilaster

Source: (Nepal, 2020)

Figure 4.12: Museum Gallery inside Dhukuti with its vaulted roofing, 2017

Source: (Nepal, 2020)

Figure 4.14: The wooden door panels are provided with metal staps and nails, 2017

Source: (Nepal, 2020)

6. **Sisha Baithak (1826) -** Hanumandhoka Palace, Kathmandu

Sisa Baithak, the northern wing of Nasal Chowk of the Hanumandhoka Palace, used to be the audience chamber of Malla kings. Later, during the reign of King Rajendra Bikram Shah, it was renovated.

Modern approach:

- Mughal architectural elements were introduced during renovation by King Rajendra Bikram Shah. The building, particularly on its southern façade, showcases the extraordinary details of Mughal Architecture merged with the traditional Newari architectural scale - **Cultural Harmony.**
- The ground floor has an open hall with series of cylindrical double columns with decorative arches and floral patterns from where the cultural events on the Nasal chowk were observed – **Direct indoor-outdoor relation.**
- The long facade of the first floor with a series of windows with glass is believed to be the first wing with glass in Hanumandhokha Palace, hence its name that translates to 'glass hall' – **New material in fenestration.**
- The regularity continues on the top floor with a long verandah provided with wooden columns and brackets with motifs influenced by Mughal architecture - **In contrast to overhang with slope in traditional architecture.**

Figure 4.15: Aerial view of Sisha Baithak ,1920s
Source: (Nepal, 2020)

Figure 4.16: Ground floor open hall gives view to the Nasal chowk, 2019
Source: (Nepal, 2020)

Figure 4.17: Southern facade of Sisa Baithak with large window panel and mougal influence

Category -2

1. **Singha Durbar (Parliament) (1903) -** Ramshah Path, Kathmandu

Singha Durbar, which was commissioned by Chandra Shamsher, is always remembered for its grandeur in scale and ornamentation. It is believed to have been the largest palace building in the early 1900 in entire South-east Asia, with more than 1000 rooms built around seven courtyards. Only the western wing remains after a fire in 1973 engulfed most of the palace.

Figure 4.18: Front facade Singha Durbar with garden early 1900
Source: (Nepal, 2020)

Modern approach:

- **Palace architecture -** Singha Durbar, which stands in axial alignments with the Dharahara (Bhimsen Stambha), is the epitome of monumentality in palace construction. With the notions of facade as an entity with space of its own right, an entity in which a distinct border is difficult to ascertain due to the interaction of light and shade over the columns. The outside facade of "Singha Durbar" is marked by a dramatic central projection and lavish ornamentation (finished in stucco and marble), which is in keeping with the baroque style of architecture, which originated in Italy (Tandukar, n.d.).

- The engineering team of Kishore and Kumar Narsingh Rana created the palace, which has 1700 rooms and 7 courtyards. The method seems to fit the Kathmandu valley's microclimate well with its courtyard planning – **Climatic response.**

Figure 4.19: Elaborate stucco decor used in interior of the state hall, 2019
Source: (Tandukar, n.d.)

- The central part consists of the State Hall with elaborate interiors of marble, crystals and glass which is still one of a kind in Nepal – **New materials.**
- This grand structure built in brick masonry has been provided with metal ties and I-sections and adaptation of local craftsmanship can be seen in the interiors through imitation of stucco plaster in wood and stone – **Respect for local knowledge.**
- The palace's size overpowers human proportions, which was possibly done on purpose to show off their dominance or appease their British colleagues – **Grandeur building scale.**

2. Gaddi Baithak (1908) - Basantapur, Kathmandu

Gaddi Baithak is the latest addition to the Hanumadhokha Palace complex. It was commissioned by Chandra Shamsher to receive the foreign delegates visiting the palace. During Indra Jatra foreign delegates were invited to observe the Kumari chariot festival, a tradition that still continues.

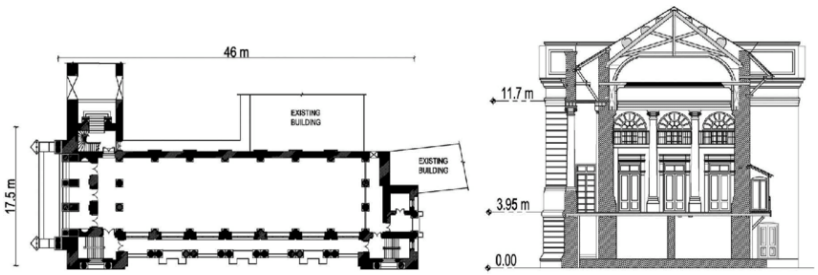


Figure 4.20: Gaddi Baithak Palace plan (left) and section (right)
Source: (Sonda, Miyamoto, Kast, & Khanal, 2018)

Modern approach:

- The colonnaded balcony on the southern façade, which used to have in its original design a large stairway leading to the main hall from the square, exemplified the grandeur of the hall **- Grandeur building scale.**
- The decors from Greek and Roman architecture are reflected in the motifs used in the exterior as well as interior of the building – **Historic Western architectural style.**
- The hall is embellished with pressed tin ceilings and appliqués on the wall, along with crystal chandelier, Venetian mirrors, a stained-glass door as well as an elaborately carved wooden showpiece – **New materials.**
- The hall is well illuminated by natural light through double height large windows – **Natural light.**

Figure 4.21: West facade of Gaddhi Baithak
Source: https://www.flickr.com/

Figure 4.22: Interior of Gaddhi Baithak, illuminated by natural light
Source: https://kathmandupost.com/

Figure 4.23: South Facade of Gaddhi Baithak
Source: https://www.flickr.com/

3. **Gallery Baithak (1937) -** Naxal, Kathmandu

This historic two storied building was the theatre hall within the Singha durbar premises, built by Juddha Shamsher.

Modern approach:

- Juddha Shamsher has experimented on the use of hybrid ornamentation. The traditional elements of Newari architecture, Mughal architecture and western architecture have been integrated in the interior and exterior of the building, which indicates the changing political circumstances in the mid-20th century. The Greek key, Kalasha and cusp arches all in one building is rare to find, which is unique to this building.
- The front facade is dominated by the neoclassical ornamentation and a large glass and metal canopy.
- Largely remodeled in 1937 with the innovative skylight in the hall area. For its novel lighting effect, it was also called the "Lighthouse".

Figure 4.24: The Gallery Baithak
Source: https://www.dw.com/

Figure 4.26: Metal canopy on front façade
Source: (Nepal, 2020)

Figure 4.25: The hall lit naturally by the use of skylight
Source: (Nepal, 2020)

Category -3

1. **Saraswati Sadan (Bed Prasad Lohani 1943) -** Ranipokhari, Kathmandu

As the country's first concrete building, Saraswati Sadan represents a turning point in contemporary architecture in Nepal. Reinforced concrete and reinforced brick concrete were among the brand-new, cutting-edge materials and technologies used in its construction. The main architectural structures were initially constructed between the 1940s and the 1960s, during the early modern period. These structures are highly inspired by architectural and engineering ideas that transcend beyond historicity and are mostly defined by the early usage of reinforced cement concrete. Are a good example of early modern architecture and contain aspects of "modern" architecture.

Figure 4.27: Saraswati sadan
Source: (Nepal, 2020)

Modern approach:

- Due to its curving front facade, it is also known as Golghar. The Lohani design is **straightforward, practical, and structurally sound**.
- **Large spans** have been provided by using strong walls and **deep beams**. The balconies' **free-floating cantilever** look is achieved by using **inverted beams** as well.
- Lohani has also made an effort to **experiment with levels and light** in the design.

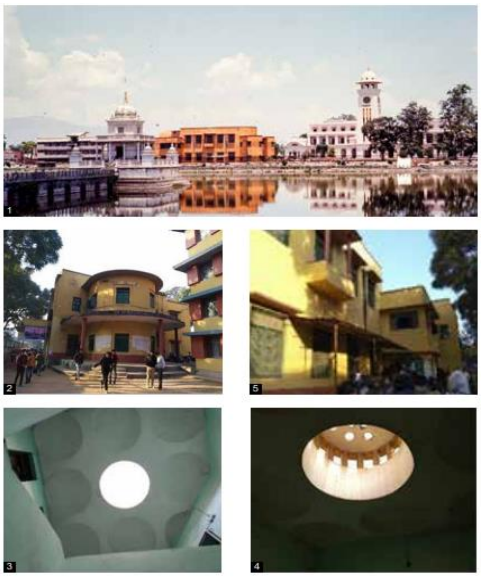


Figure 4.28: view of Saraswati sadan behind Ranipokhari , projecting concrete slab, use of skylight and the ceiling design in the lower lobby of the northern wing with cantilever balconies and projections

Source: (Nepal, 2020)

- The structure has been equipped with **clerestory windows and skylights** to let in diffused natural light.
- Built using new and **innovative materials and technology** including reinforced concrete and reinforced brick concrete.
- Design is **simple, functional, and structurally stable**. Saraswati Sadan is said to have a hanging portico to prevent rain splutters.

2. **Tribhuvan University Central Library (Robert Weise 1963) –** Kirtipur

The first library building built within the premises of the Tribhuvan University Campus contributed largely to education in Nepal. The architecture blends the local architecture of various region of Nepal contrasted by the brise-soleil.

Modern approach:

- The use of stone as building material represents the hilly region of Nepal, whereas the strut and window designs were borrowed from traditional Newari architecture.
- Building reflects a wonderful balance between traditional and modern styles. The quality of workmanship for the casting of the RCC brise-soleil is commendable along with the use of the metal sections for the doors and windows.

Figure 4.29: The central Library building, 1970s
Source: (Nepal, 2020)

- The two-storey central block was separated from the original single-storey side wings with construction joints. The later extension on the terrace blends well with the original design; however, the quality of construction is less robust.

3. **Laboratory School (Benjamin Polk 1965)** – Kirtipur

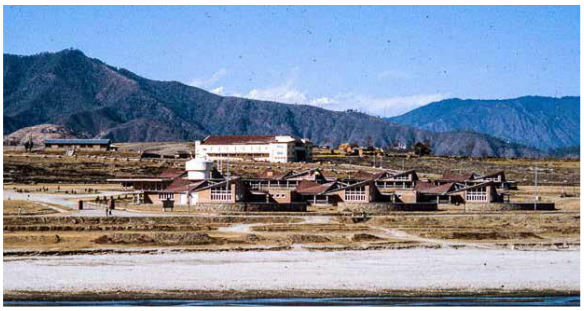


Figure 4.30: The premises of the Laboratory school, initially opened as TU demonstration school, 1969. Source: (Nepal, 2020)

An American designer and architect, Benjamin Polk designed the school complex that displays exceptional planning and building form, reflecting the progressiveness of modern education in Nepal. Laboratory school was formerly opened as a 'laboratory' for upcoming teachers to practice teaching. It is one of the pioneer schools in Nepal which started co-education for visually impaired students, who study together with sighted students.

Modern approach:

Figure 4.31: The classroom blocks aligned with its wing like parabolic RCC roof, 1969
Source: (Nepal, 2020)

- It has a linear configuration of total seven rhombus modular units around an administration block located in the center – **Courtyard in natural setting.**
- Every module has a set of four-square classrooms and each classroom has a parabolic concrete roof aligned in different direction. A pair of two parabolic slabs gradually rising up in opposite direction resembling a bird in flight with spread wings – **Experimentation with concrete.**
- Building form also blends with the undulating natural terrain of the site – **In relation with nature.**
- This unique design, and the composition of the blocks, enhances the natural lighting, as well as ventilation within the classrooms – **Natural light and ventilation in unique way.**
- The units, which are built in exposed brick, have a peripheral colonnaded corridor with flowing spiral slabs and parapets in raw concrete, serving to create a playful environment for students – **Blend of brick and concrete.**

Figure 4.34: The playful walkway along with flowing concrete slab edge

Source: (Nepal, 2020)

Figure 4.33: The corner windows illuminating the interior of the classrroms, 2019

Source: (Nepal, 2020)

Figure 4.32: The clerestory windows below the winged concrete slab

Source: (Nepal, 2020)

4. **Hotel Soaltee– original block (Ganga Dhar Bhatta and Shankar Nath Rimal 1966) -** Kalimati, Kathmandu

The Soaltee Kathmandu is Nepal's top 5 Star Deluxe hotel, and it is authentically Nepali in character and has a spectacular view of the Himalayas. The hotel is situated in a lush green 12 acres of manicured territory and offers 285 exquisitely decorated rooms, a diverse selection of fine dining options, and magnificently constructed conference spaces, making it the perfect place for business, pleasure, and all celebrations.

However, the original block of Hotel Soaltee is the first international style tall building within the skyline of Kathmandu.

Figure 4.36: The regular modern facade of the hotel Soaltee, circa 1966

Source: (Nepal, 2020)

Figure 4.35: The original Soaltee hotel building, 1972

Source: (Nepal, 2020)

Modern approach:

- The modernist cube design with plastered façade, represented the international style – **Totally in modern approach.**
- The construction systems of reinforced cement concrete framed structure with a basement and raft foundation were introduced to create this modern building **- Innovative building construction systems at that time.**

- Refurbishment of the building in the 1990s introduced brick cladding and sloped roofing, to show Nepaliness in building – **Respect for culture???**

Figure 4.37: Block 2, Nepali in style
Source: https://www.tripadvisor.com/

Figure 4.38: The building after the facade relifting in 1990s
Source: (Nepal, 2020)

5. **Rastriya Sabha Griha (Ganga Dhar Bhatta 1967)** - Pradarsani Marga, Kathmandu

Rastriya Sabha Griha (National Assembly Hall) also known as City Hall is the first public assembly building for indoor functions built in Kathmandu. Designed by Ganga Dhar Bhatta (First architect of Nepal), the function is clearly reflected in its form, with the massive curved façade enveloping the main hall.

Figure 4.39: Rastriya Sabha Griha
Source:https://spacesnepalblog.wordpress.com/2018/06/12/nepals-first-architect/

Modern approach:

- The building fully satisfies its function – **Modern building for modern function.**
- Considered three types of people:

1) Firstly, he provided a large stairway connecting the first level and ground floor for pedestrians.
2) Secondly, a porch and ground-floor lobby were provided for the vehicle.
3) Lastly for performers, different entrance

Figure 4.40: Construction of Rastriya Sabha Griha, 1967
Source: (Nepal, 2020)

- The front façade of the city hall reflects the modern architectural style with the use of pure geometrical form, cantilever slabs and clean horizontal & vertical line - **Totally in modern approach.**
- The use of reinforced concrete for the auditorium hall, cantilevered curved slab, the grand frontal stair, as well as the main entry gateway to the premises reflects the versatility of this modern material – **Modern material and its flexibility.**
- The floor to ceiling transparent façade creates openness to the exterior in the lobby area, signifying publicness of the building – **Simultaneity in architecture.**

Figure 4.42: The stairs leading to the first floor lobby supported on the RCC frame
Source: (Nepal, 2020)

Figure 4.41: Rastriya Sabha Griha with creative use of forms
Source: (Nepal, 2020)

6. **Narayan Hiti Royal Palace (Binoy K. Chatterjee and Benjamin Polk 1969)** - Durbar Marg, Kathmandu

The original royal palace of the Shah Kings after they conquered Kathmandu Valley was at Hanumandhoka. It was towards the end of the 19th century that the Rana Prime Ministers moved the King outside the old city to Narayanhiti Durbar, a neo-classical Rana period building. Once King Mahendra got to power in the 1950s, he quickly worked towards creating a new national image for Nepal. The design of a new palace block within the Narayanhiti Palace complex reflects the new vision of modern Nepal projected by late King Mahendra.

Figure 4.43: Narayan Hiti Royal Palace
Source: (Nepal, 2020)

Modern approach:

- A two-tiered pagoda roof dominates the central structure as a reminiscent of the past, while the design of the nearby modern tower represents the future. The plastered towers rise out of a plinth in exposed brickwork.
- Used a combination of horizontal lines, hipped roofs, horizontal bands of windows, and large overhanging eaves.
- The shikhara form and the towering building on its left were expertly arranged to capture the formal Nepali spirit.
- The entire form has structural shear walls in some areas and is planned as a frame structure overall. OPC is utilized for structural work, while mild steel and machine-made bricks are also employed for RCC.

Figure 4.44: Front facade with the two towers dominating the façade

Source: (Nepal, 2020)

Designing the exterior

King Mahendra requested ideas for his new palace from a number of international architects. It's unclear whether these invitations overlapped (creating an unofficial competition) or if each connection was made separately. The functional requirements of the palace appear to be more clearly expressed when compared between a Robert Weise sketch design and the actual structure, as both depict a comparable distribution of space between guest, state, and private activities. A second contrast, this time between the final design by Polk and the concept sketch by Robert Weise, demonstrates a definite symbolic departure from the neoclassical Rana past. The Ranas adopted the neoclassical design to set themselves apart from their community and represent their

symbolic pursuit of equality with the British (Weiler 2009). When compared, the designs of Robert Weise and Benjamin Polk reveal that the shape of the palace façade (of a contemporary Hindu ruler) was forced to borrow from traditional (Newar) forms because they both adopted a tiered pagoda roof as a defining feature.

Following Polk's personal visit to the king in 1961, the designs by Benjamin Polk (1916–2001), a Californian with a commercially successful joint practice in Calcutta (1957–64), were approved. Polk stated that he wanted to "feel why the ancient buildings were as they were, to comprehend the people, and to work freshly" when he was creating the palace (Polk 1993a: 9). In the 1960s, there was a focus on capturing the essence of a location, and one of the main purposes of buildings was to orient us—to tell us where we are. It raises issues with authority over what is authentic and, of course, authenticity itself: "The Palace would be a remembrance - about which might cohere visually once again a Nepali purpose - a will that is needed to address today's long-term difficulties and to sustain independence from its two huge neighbors," the author wrote (Polk 1993a: 8). Polk placed a strong emphasis on the palace as a means of bridging the past and the present, and it is clear from his writings that he was aware of both the Panchayat rhetoric and King Mahendra's notion of monarchy. He only traveled to Nepal for business engagements, though, and it appears that he did not venture far from the Kathmandu Valley in his hunt for the real. In 1964, he and his wife Emily left to travel to the United States, putting government engineer Shankar Nath Rimal in charge of managing the palace's development. Polk claims that he provided continuity, but it is more appropriate to see him as assembling pieces of an existent world into an imagined one using what was available and following the king's instructions. A team led by Prince Gyanendra oversaw construction, which started in 1964. Shankar Nath Rimal served as the committee's intermediary throughout Benjamin Polk's conversations over the palace's design, which he thought to be a frustrating procedure. The committee authorized design revisions such using brick (a material linked with tradition) as a face material rather of marble and hiring anti-Rana nationalist artist Bal Krishna Sama to create the ceremonial entrance doorway to the main reception area (Whitmarsh, n.d.).

7. **Ministry of General Administration (Shankar Nath Rimal 1960s)** - Singha Durbar, Kathmandu

Experimentation with new architectural expression was being undertaken in the late 1960s. The design of the Ministry of General Administration building.

Modern approach:

- The building emphasizes the purity of form represented by superimposed cubes – **Pure geometric form.**
- Ground floor represents the brick expressionism whereas large glass openings in first floor gives floating effect to upper second floor horizontal white cuboid. Introduction of reinforced cement concrete made it possible for taller buildings to be built and this is expressed in the tower-like structure with large glass facades of the Ministry of General Administration building – **Material selection.**
- The expression of minimalism and harmony without symmetry, created by a composition of forms, is unique to this building – **Minimalistic design.**

Figure 4.45: The modernist minimalistic facade of Ministry of General Administration
Source: (Nepal, 2020)

Figure 4.46: The tower with large glazing façade
Source: (Nepal, 2020)

Category -4

It's possible to characterize the 1970s and 1980s as a period of growth. In the Kathmandu Valley, a lot of planning was done in the 1970s. Soon after, the valley became accessible for modern development, and a number of projects providing technical support from different nations and international organizations arrived. Many different international architects have worked on and contributed to the architectural design of Nepal because of the country's comparatively limited experience in creating modern building types. Involvement with Nepali projects over the past 50 years has taken many different paths, and the architecture created by these foreign architects as a result is consistent with the nature and characteristics of these paths as determined by the scope, complexity, funding, and intended use of the projects. Their works can be classified into four categories.

Table 4.2: Works of foreign architects in Nepal

The 1st Stream: Foreign Practitioners in Kathmandu	**The 2nd Stream:**
The Valley must have been a magnificent sight to behold for the early foreign architects like Carl Pruscha, Robert Weise, David Dobereiner, Gotz Haagmueller, and John Sanday. The ancient cities of the Valley were situated between vast stretches of lush green paddy terraces, meandering rivers, and the surreal baroque garden palace compounds constructed at the turn of the last century. They were drawn to the rich traditions of this place and created design concepts that reflected the culture rather than propagating preconceptions from their home nations. In addition to them, countless other international architects	Belongs to the creations of well-known architects who were hired by international humanitarian organizations or agencies to develop certain structures or complexes in Nepal. Most of these only involved one project over a brief period of time, and they hardly ever show the architects' original efforts in novel, difficult contexts. **Kenzo Tange** prepared the Master Plan of Lumbini, Buddha's Birthplace. The Family Planning Centre, designed by **Louis I. Kahn.**

The 1st Stream: Foreign Practitioners in Kathmandu	The 2nd Stream:
have contributed to the planning and development of a variety of community-based projects throughout Nepal, including schools and hospitals/health centers, which were funded by outside sources years ago (B. Shah, 2016). **Robert Weise** designed residences, hotels and office buildings. He is praised with bringing back the regional architectural scale and the sloping roof shapes, which are two extremely important aspects of the Valley's traditional architecture. **Projects**: Annapurna Hotel, The Yellow Pagoda Hotel, the Nepal Army Headquarters. In the late 1960s, **Carl Pruscha** was hired by the UNDP to create the Valley's first urban development plan. He also oversaw the creation of the Valley's first inventory of its cultural sites. **Other significant projects**: Tara Gaon Hotel and the Institutional building CEDA for Tribhuwan University. Austrian architect **Gotz Haagmueller** settled in Bhaktapur after arriving in	The renowned Japanese architect **Tadao Ando** created a Women's and Children's hospital in Butwal, which was funded in the 1990s by the Japanese charity organization AMDA. **Benjamin Polk,** the American architect, designed the new Narayanhiti Royal Palace.

The 1st Stream: Foreign Practitioners in Kathmandu	The 2nd Stream:
Kathmandu in the 1970s to work on the GTZ-backed Bhaktapur Development Project. His work has focused on rehabilitating various historically significant structures. He has also used his extensive experience and understanding of the Valley's traditional architecture to establish architectural innovations in the adaptive re-use of ancient buildings in Patan, Bhaktapur, and Kathmandu. His notable accomplishments include the Patan Museum, the Keshar Mahal Gardens, and his own home in a Bhaktapur courtyard. These projects provide as examples of the numerous contemporary design options available when renovating historic structures.	

The 3rd. Stream:	The 4th Stream: Architecture; For Private Sector:
Large and programmatically complex building complexes that were constructed as technical aid projects are the subject of work by international architects. To guarantee a particular standard in design and construction, the bilateral agencies	The most recent wave of works by foreign architects is focused on massive, privately marketed construction projects that are driven by commerce. Large hotel projects include the Fulbari Resort, Yak & Yeti, Taragaon Hyatt Regency,

The 3rd. Stream:	The 4th Stream: Architecture; For Private Sector:
who carried out these projects brought their own consortia of architects and experts. The majority of these projects called for designing and constructing unique building types that had never been done before in the Valley. Its influence on modern architecture has therefore been quite little (B. Shah, 2016). To build the Teaching Hospital Campus, the Sano Thimi Tuberculosis Center, and the Disaster Mitigation Center, JICA, consortiums of Japanese architects, were hired. The General Post Office building, the telecommunications buildings, and hospital projects including the Bir Hospital, the BP Koirala Institute of Medical Sciences in Dharan, and most recently the New Trauma Centre in the Bir Hospital were all completed by government architects from India. Although it would be challenging to prove that these designs had any outstanding architectural value, they show a certain level of design and detailing discipline as well as an awareness of the municipal context. The Birendra International Convention Centre and the new Civil Employees' Hospital were designed by Chinese	Soaltee, and Radisson. Foreign architects have worked on projects in this category for clients based in Nepal that have been financed by Nepalese banks, built primarily by Nepalese contractors, and given the go-ahead from Nepalese authorities. As a result, these programs have involved local stakeholders considerably more than earlier technical assistance/grant projects did. However, the architecture was not properly integrated with the Nepali environment. Although the Taragaon Hyatt Regency Hotel asserts to have incorporated the fundamental spatial and formal elements of the traditional built environment, the results appear to be considerably dissimilar from this assertion. The design's two most crucial elements, the conventional building form and the scale and space composition, were poorly taken into account (B. Shah, 2016).

The 3rd. Stream:	The 4th Stream: Architecture; For Private Sector:
government architects, on the other hand. Both projects occupy prominent locations, yet their architecture doesn't seem to be trying to interact with the city in any way. Additional projects include the Tribhuwan Airport's International Terminal Building, the US Embassy complex, the Japanese Embassy and the Ambassador's Residence, the German Embassy, the Chinese Embassy, the Russian Embassy, the Danish Embassy, and the new Indian Embassy. Despite being a big chance for the nation to express its cultural identity, Embassy buildings don't seem to be very successful in this regard. The design development of the project leading to construction for the Norwegian Embassy, created by Norwegian architect Kristin Jarmund, took place in Kathmandu in partnership with Nepalese experts. The design concept purposefully aims to blend into and add to the urban fabric while giving us a taste of contemporary Scandinavian aesthetics.	

For the emerging architects in Nepal, exposure to the variety of architectural creation within the context of development produced by these international architects offers considerable learning. This could be quite helpful in establishing Kathmandu's

architectural design goals and directions. However, the valley experiences damage and the extinction of tradition rather than modernization and transformation was overlooked owing to rapid urbanization because of economic and political upheavals. Kathmandu's architectural environment was unable to convey the depth and genuine meaning of modernism.

4.2 Unit of analysis for the study

4.2.1 Climate

One of the key elements that affects architecture is the climate. It is not particularly appropriate to analyze the climate in relation to architecture only since architecture is a complex product where, in addition to the environment, materials, construction techniques, and political, social, and religious factors have all played a role (Shastri, 1959).

The planning, structure, kind of roof, and outside finishing of architecture are all influenced by the climate:

- Cold to hot climates exist. Cold, in the broadest sense, refers to confined and compact planning. Heat necessitates candor.
- Extremes of heat and cold favor huge, dense constructions. The usage of light constructions is permitted in temperate climates.
- The roof's shape is determined by the snow and rain.
- The treatment of openings and their placements are determined by the amount of daylight, breezes, clouds, and humidity.
- These broad environmental conditions had long been reflected in historical architecture.
- Egypt, with its scorching sun, high temperatures, and lack of rain, produced the pyramids, as well as large, windowless walls and flat, thick roofs.
- Buildings in Babylon, Syria, and Mesopotamia were elevated platforms reached by wide stairways and ramps because of the region's wet, low-lying plains, swamps, and severe rains.
- With its dry and warm climate, Persia produced wide rooms with columns. Due to Islam's political power, Persian influence was also noticeable in Asian nations.

- Greece has a less severe climate than other countries, yet it nevertheless has colonnades and porticoes because to the sporadic hot weather.
- The Romans were influenced by the Greeks, and since the climate in Italy was not particularly conducive, they added porticoes and colonnades to their architecture.
- From north to south, France experiences a range of climates, from temperate to subtropical. The variance controls how big door and window openings are, which get smaller in the south. In order to shed snow, roof pitches are steep in the north and nearly flat in the south. Later, classical and Christian influences spread to the other European nations.
- Courtyards, verandas, balconies, chhajjas, perforated jallis, ponds, and fountains are traditional climatic features in India.

Climate conditions have an impact on built environments. Numerous climate-responsive or solar passive design techniques have been found to be used in Nepalese traditional homes, according to studies. The following are examples of vernacular architecture in Nepal that uses climate-responsive design strategies:

Table 4.3: Climate-responsive design strategies in vernacular architecture of different climatic

Source: (Bodach, Lang, & Hamhaber, 2014)

Climate-responsive design strategy	Climate zones			
	Subtropical	Warm temperate	Cool temperate	Alpine
Solar passive heating	–	+	±	–
Protection from the cold		±	+	+
High thermal mass of walls and floors		+	+	+
High thermal mass with night ventilation	–			
Building orientation north–south	±	±		
Compact settlement and building layout			+	+
Low thermal mass of walls and floors	+			
Light well insulated roof	+	±	±	
Heavy roof				+
Reduction of direct solar heat gain in summer	+	+		
Enhancement of air movement in summer	+	+	±	
Protection from heavy rain	+	+	+	
Outdoor sleeping space for summer	+			
Small openings to reduce heat losses				+
Medium sized openings	±	+	+	
Shading of openings in summer	+	+		

+: applied; –: not applied; ±: partly applied.

Consider Kathmandu, which is 1340 m above sea level and located between 27°36° and 27°50° north latitude and 85°7° to 85°37° east longitude. Nepal's societal, economic, touristic, political, and administrative centers are all located in Kathmandu. It has a mean monthly high temperature of 29.30oC, a mean monthly low temperature of 0.90oC, and an average annual temperature of around 16.50oC. Relative humidity can range from 36% to 100% depending on the temperature, with greatest humidity often occurring around dawn (Showa Shell Seiku, 1998). Due to the Indian monsoon, 1,400 mm of rain falls yearly, mainly from March to September. The wind typically blows

very little throughout the year, but in and around the hot months, it becomes fairly strong. The average daily solar radiation is 4.13 kWh/sq m, or around 1510 kWh/sq m annually, but there are between 3.3 and 8.4 hours of sunshine per day on average. (HMG, n.d). (Showa Shell Seiku, 1998).

The bioclimatic chart (Olgyay, 1962), building bioclimatic chart (Givoni, 1976), and Mahoney tables can be used to plot various climatic data to determine the thermal comfort condition and the needs for climatically responsive planning and construction (Koenigsberger, et al., 1973). An analysis of the bioclimatic chart (daytime temperature-humidity relationship) and building bioclimatic chart after plotting the climatic data for all the months in the Kathmandu Valley reveals that four months—March, April, May, and October—lie in the comfortable range, with nighttime temperatures falling below the comfortable range, while another four months—June, July, August, and September—are hot (Upadhayah et. al, 2006). November through

Figure 4.47: Climatic analysis of Kathmandu from Bioclimatic Chart and Building Bioclimatic Chart
Source: (Shrestha, n.d.)

February, the latter four months, are also frigid. Therefore, Kathmandu needs heating in buildings for roughly eight months of the year, as well as cross ventilation, for the final four months of the summer (Shrestha, n.d.).

Table 4.4: Design recommendations for Kathmandu's climate

Source: (Shrestha, n.d.)

Aspect	Recommendation	Aspect	Recommendation
Layout	North-south orientation with long axis on E-W	*Walls & floors*	Light walls, short time lag, low thermal capacity
Spacing	Open space for breeze penetration but protection from hot and cold winds	*Roofs*	Light, insulated roof, reflecting surface
Air movement	Rooms with single banked with provision of air movement	*Protection of opening*	In north and south walls at body height on windward side
Openings	Medium openings [20-40%]	*Protection of wall & opening*	Protection from rain

Similar to this, utilizing data on temperature and humidity from Kathmandu, the Mahoney Table is used to generate the pre-design standards for thermal comfort design in buildings (Upadhayay et. al, 2006). This analysis uses eight components under the headings of layout, spacing, air flow, openings, walls, roofs, outdoor sleeping, and rain protection requirements to look at how conventional building stocks have altered in Kathmandu's historic center. A north-south orientation with a long axis in the East-

West direction is desirable, and open locations with protection from hot and cold winds are advised. Each construction must feature quick-acting light walls, medium apertures (20%–40%), and rain protection for the windows and walls.

4.2.2 Spatial attribute

It is obvious that all structures and the built environment as a whole are basically social and cultural artifacts. Buildings are a product of social demands and serve a number of social, political, economic, religious, and cultural purposes. They are shaped by a society's ideals, modes of economic and social structure, allocation of resources and power, activities, and the beliefs and values that are in vogue at any given moment. These elements also influence their size, appearance, location, and form. The built environment of a society changes along with social changes. As older building kinds become outdated, new ones appear. Some structures change, grow, and serve new purposes, while others might just vanish. Buildings do not make society, but they do contribute to the maintenance of many of its social features (Ghinita, 2016). Therefore, the relationship between architecture and society is clear, and even though it is occasionally disregarded, it is something we must consider whenever we build or design something for a population other than ourselves.

According to several academics, "culture" plays a key role in the design of architectural spaces and is essential for societal sustainability. Architecture is a representation of culture that has changed over time. As a result of these changes and the extent of cultural influence, new architectural styles and construction techniques have emerged, creating unique architectural spaces. Any society's history, civilisation, customs, and beliefs all contribute to its culture. In many societies, architecture serves as a reflection of how people have thought about space, aesthetics, and culture. As a result, each period's architectural style is a reflection of culture and art and corresponds to changes in both life and the arts (Askarizad, 2019).

Researchers claim that rather than being a physical building that is influenced by society elements like culture, religion, economy, and the environment, architecture is an institution with several purposes. Since architecture is a cultural construct, the culture whose architecture it is a product of also influences its shape and organization. As a result, the social interactions of the inhabitants are represented by the architecture, which adheres to their traditions and spatial discipline. Researchers that focus on culture

contend that culture is the primary influence in the development of architectural space, with climate and site being among the top two determining factors. Shah (1985a) further highlights that while socio-cultural heritage and conduct are portrayed considerably differently, architectural conceptions formed from the perspective of the climate are nearly comparable.

4.2.3 Material

Aesthetics, usefulness, and context all play a role in architecture. Strong conceptual design, historical context that is pertinent to the project's design and need, current relevance of the project's design and need, implied architectural design, attention to and creation of eye-catching details, well-built and innovative structural design, and well-executed project—among these heavy terminologies, one might discover thoughtfulness. Architects from all over the world compete to realize extraordinary ideas. The importance of material decisions, however, can be credited as one of the most important factors in all the notions described above. Carefully choosing materials for a design can help to produce and contribute to a healthy and harmonious atmosphere, depending on their geographic, historical, cultural, and political significance. Architecture outlives humanity as seen by the communities from the old civilizations, the sturdy structures, and the abundance of Heritage treasures (Balooni, 2020).

Figure 4.48: Traditional to modern building material
Source: The role of building materials in architectural design (slideshare.net)

Materials are crucial for providing architecture strength and durability, but it's necessary to think about how they will affect the environment and the people who live there in the long run.

Traditional vs modern materials

1. **Eco-friendly Technique:**

The main focus of traditional architecture, commonly referred to as vernacular architecture, is the use of environmentally friendly building materials. Today, the threat posed by climate change is plainly visible. Contrary to modern construction, modifying buildings to meet local building requirements can significantly reduce their carbon impact. In order to better endure extreme weather events like hurricanes, earthquakes, landslides, etc., this also entails creating more durable homes.

2. **Cost-effective:**

Given that most of the materials used in traditional building are local and natural, it is inexpensive. Contrary to contemporary architectural ideas, finishing materials could be pricey. Furthermore, unlike modern architecture design, the workmanship involved does not require sophisticated machinery for processing or installation.

Additionally, this style of construction contributes to the preservation of a region's feeling of cultural legacy. Using traditional building methods and materials has unquestionably demonstrated its endurance throughout time against the effects of the weather.

3. **Energy-efficient and Low Maintenance:**

The use of energy-efficient materials in traditional construction over modern architecture is one of the main reasons why it is preferred. It is typically regarded as being more resilient than contemporary architecture. For instance, constructions like stone limits might last for a thousand years or longer with little to no upkeep. Modern architectural designs typically only endure a generation or less before requiring expensive maintenance.

Architecture's current hot theme, regionalism, can be achieved by fusing locally meaningful traditional materials with cutting-edge technology. Modern architectural structures emphasize how traditional materials and technology have persisted over time. Continuity not only provides traditional materials modern and artistic decorative

functions, but also strongly expresses traditional emotions of modern buildings by combining different traditional materials' properties with that of new materials, adopting their advantages, and avoiding their disadvantages (Wang, 2014).

4.3 Cultural significance, materiality and climatic response of traditional built form and architectural vocabulary in Kathmandu

The urban morphology of Kathmandu, including its street patterns, layout, and building typology, not only reflects the sociocultural behavior patterns of its residents but also has an impact on the settlement's thermal performance. Built-up regions have an impact on the solar radiation's absorption and reflection, heat storage capacity, absorption and emittance of long wave radiation, winds, and evapotranspiration. The urban climate is significantly influenced by the geometric structure of the urban canopy layer [Arnfield, 2003]. Urban microclimate is a phenomenon that is mostly the result of human socioeconomic activity [Golany, 1995]. Architectural built forms have changed as a result of changes in climate, way of life, and building material accessibility.

Though many satellite towns, including Chapagaon, Shaku, Kirtipur, and Thimi, were developed during the "Licchhavi" period, when Kathmandu was officially founded in 1143 A.D., the earlier human settlement from the "Kirata" period (prehistoric), which was situated on high ground, was further expanded through grid iron planning during the "Malla" period. From a cultural and climatic perspective, the town's position was crucial in many ways.

First, a compact village was created along the route of trade between Tibet and India in order to conserve agricultural fields in addition to promoting trade and business. Integration of land usage facilitated closeness, comfortable weather, and social contact.

Second, by building the settlement on high elevation, it was possible to gain maximum solar radiation, particularly for the severe winters, and safety from the frequent river flooding. Riverfronts and low-lying areas were better suited for agriculture than for human habitat since they were frequently blanketed in morning fog and the formation of cold air basins.

Third, because of the high ground, the drainage issue was naturally resolved, and the river provided easy access to the water required for the agricultural area at the river basin.

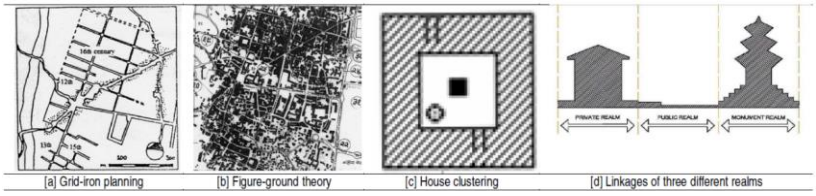


Figure 4.49: Traditional planning & built form with linkages of individual building, community space and monuments

The settlement was made up of both built up areas and open spaces that acted as complementary "figure-grounds." At the neighborhood level, streets (festival routes, daily activity routes, and funeral routes) and open spaces (Palace Square, Market Square, and Street Junction Square) were built up according to a hierarchy. In addition to being used for gathering during festival season, public open spaces (public domain) were also used for a range of daily activities, including assembling in the event of an earthquake. They came in various shapes and sizes and were supported by community amenities like rest houses (paati), temples, wells, or public taps, among others. Additionally, it had built a link between the private sphere of private homes and the public sphere. In fact, the community space in front of a residential building was an integral part of Kathmandu's vernacular architecture; without it, the structure would not function as a habitable unit and the architecture would be lacking, as the majority of the daily tasks that needed to be completed inside the homes were performed in such spaces (Shrestha, n.d.).

Table 4.5: Urban thermal performance and response of built form of traditional settlement of Kathmandu

Source: (Shrestha, n.d.)

Major issues	Basic urban design response	Built form of Kathmandu
- *Low temperature in winter*	- Heating [passive and active] - Mixture of open and enclosure forms - Protected edges at winter windward side - Medium dispersed open space	- Compact settlement with clustering of houses around courtyard; - Distribution of open spaces in the form of courtyards and street squares
- *High precipitation in summer*	- Circumferential and intersecting tree strips - Uniform building heights, [Source: Golany, 1995]	- Little variation on building roof line except the public and monumental structures

The traditional compact settlement responds well to Kathmandu's mild climate. Maximum solar radiation could now be received inside buildings as well as in streets and public areas thanks to the orientation of the urban fabric and street network. Additionally, the town's thermal performance was enhanced by the square-shaped open areas (durbar, market, and residential) and their hierarchical spatial arrangement. Residential communities with 10-12% of community spaces in the form of interconnected courtyards (length and width vary from 20 to 24 m) surrounded by 3 to 4 houses with very little variation in building height but unified architectural elements (exposed brick, decorated wooden windows, tiled sloped roof) have not only permitted optimum sunlight and wind protection in the public spaces, but have also served as the venue for socializing and a symbol of coexistence. For that Kathmandu's streets were typically 4-6 meters wide with buildings lined them continually on both sides, the ratio of building height to street width was approximately 1.5, which was appropriate given Kathmandu's climate and ensured that sunshine could enter the streets and buildings.

A typical Kathmandu Newari house from the "Malla" era has a straightforward rectangular design (generally six m by 4 -8 m). These homes are vertically organized, with the ground level serving as a storage area for farm equipment, livestock, and poultry, the first floor serving as a sleeping area, the second serving as a living and working space, and the attic serving as a kitchen and a place of worship. The use of locally available materials (brick, mud, wood, etc.), similar construction techniques, and shared life styles all contribute to the formation of unified composition on building facades with little variability in building mass, architectural style, roof-lines, etc. The features of Newari vernacular architecture are an exposed brick façade, cornice lines indicating the floor height, and symmetrical window placement (different on each storey). Although the fenestration changes over time, the roof treatment, which has remained constant since antiquity, has not changed (Shrestha, n.d.).

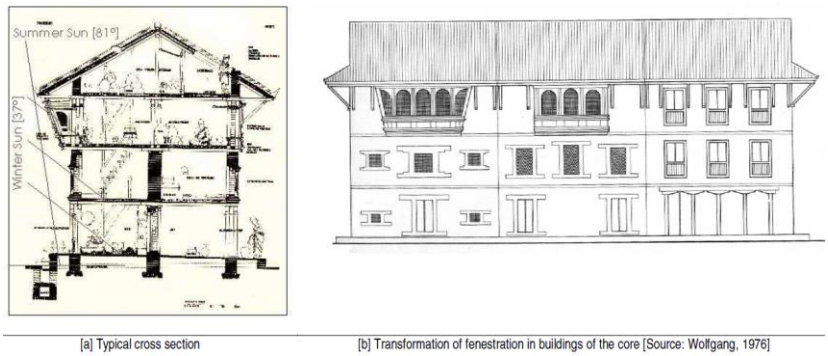
Moreover, their response to climate is noteworthy:

First, these locally produced materials are more appropriate and cost-effective in addition to having superior thermal qualities and being fully biodegradable.

Second, the thick composite walls are made of mud plaster inside and sun-dried brick on the outside, which serve as good insulators and absorbents, respectively. When the outside temperature is below the thermal comfort level at night, these walls transfer

heat into the room that was stored by the sun during the day. Mud brick construction keeps the inside at a higher temperature because it radiates the heat that has been absorbed back into the space. The mud brick's mud plaster makes it easier to balance the interior space's humidity levels and keeps them steady (Elias-Ozkan et. al 2006). On the other hand, as the humidity levels outside change, the humidity levels within the other building materials alter as well. A mud brick wall behaves similarly to an insulated brick wall with an equivalent wall thickness (Soofia et al, 2006).

The third type of roof receives the most solar radiation throughout the year: a sloped roof made of tiles with a mud layer atop wooden battens. Since the roof has a lower insulation value and a higher U value, it absorbs more heat during the day and releases the same amount at night when the outside temperature is low. As a result, classic homes always have a warm attic. Additionally, the south façade's roof overhang, which is around 60 cm, is adequate to block summer sun and rain yet easily permits winter solar heat.



[a] Typical cross section [b] Transformation of fenestration in buildings of the core [Source: Wolfgang, 1976]

Figure 4.50: Characteristics of traditional buildings in the historic core of Kathmandu
Source: (Shrestha, n.d.)

Nonetheless, traditional buildings have some weaknesses too:

First of all, the majority of classic structures have two bays and a rear with a minimal setback or none at all. Orientation issues have occasionally been brought on by the cluster of buildings surrounding the courtyard. Additionally, the amount of cross ventilation and natural light penetration has been constrained by the modest window openings on one side of the room. By absorbing heat during the day and expelling it at night, heavy wooden panels in the windows prevent sunlight from penetrating and hinder airflow.

Second, traditional building materials need more upkeep and deteriorate over time when exposed to the elements.

Thirdly, the ground floor of traditional homes does not have Damp Proofing Course (DPC), which makes them cold, damp, and uninhabitable. The lack of a tie beam linking all four sides at different heights and the weight of the roofing material are the last reasons why traditional structures are sensitive to seismic risk.

The traditional Newari home is thus an essential part of Nepal's material cultural history. Every component has cultural and religious importance related to their material and spiritual lives, making it more than just a brick and wood structure. It emphasizes the utmost level of human comfort, security, and protection from a materialistic standpoint. However, from a social perspective, it stresses neighborhood life through customary rituals, celebrations, and festivals. Last but not least, from a spiritual perspective, it emphasizes the omnipresence of gods and goddesses outside and inside the home (Maharjan, n.d.).

CHAPTER 5. CASE STUDIES AND FIELD WORKS

5.1 Saynatsalo Town Hall, Alvar Alto, 1952

Figure 5.1: Saynatsalo Town Hall
Source: https://www.re-thinkingthefuture.com

Alvar Aalto was one of Finland's most significant architects, and throughout his career, his work gradually transitioned from Nordic Classicism and Functionalism to an experimental, locally inspired modernism with a phenomenological design philosophy that was uniquely Finnish. Aalto preferred organic materials like brick, stone, or wood over the machine aesthetic that was popular among his contemporaries. In 1957, he received the RIBA Gold Medal. In his essay, Kenneth Frampton listed Aalto's Saynatsalo Town Hall as an example of 20th-century critical regionalist architecture (Elengical, 2022).

During the first part of the 20th century, Finland had significant economic growth and industrialization, and many of Aalto's early clientele were businessmen.

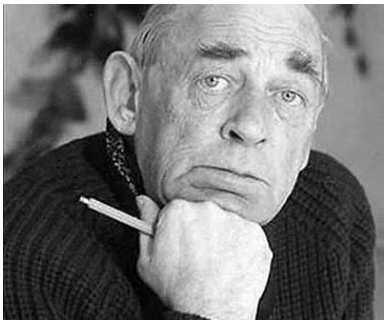


Figure 5.2: Alvar Alto

Architect's autobiography, academic and design inspirations: Aalto studied at the Jyväskylä Lyceum school, completing his basic education in 1916. He subsequently enrolled in the Helsinki University of Technology's architecture program in 1916 and earned his degree there in 1921. He went back to Jyväskylä in 1923 and established his first architectural firm there. Aalto Studio, Inc. He wed architect Aino Marsio the following year. Aalto's intellectual connection to Mediterranean culture was cemented during their honeymoon trip to Italy, and it would stay significant to him for the rest of his life. Beginning in 1927, Aalto began working with Erik Bryggman. 1933 saw a new relocation of the office to Helsinki. In Helsinki, the Aaltos created and constructed a shared home-office for themselves, but eventually had a purpose-built office constructed in the same area.

Aalto is regarded as one of the leading figures in Nordic Modernism. But he began with Nordic Classicism, a movement that had emerged in opposition to the local Romanticism movement. He joined the International Congress of Modern Architecture, and it was at this time that he began carefully studying Le Corbusier, who was the primary inspiration for the modernism movement.

Design context: In 1944, Säynätsalo, a small industry town on a tiny island in central Finland's Lake Päijänne, recommended that Aalto design and construct a town plan. Säynätsalo was first developed in 1945. Following Aalto's victory in a government-mandated competition for its design, the town hall would eventually be constructed. A council chamber, regional government offices, a public library, staff residences, and retail space were all planned for the civic complex, which would eventually allow the town hall's operations to develop beyond their initial restrictions. Aalto took use of the chance to create a structure honoring European democracy. It is amazing considering that the municipal center is intended for a 3000-person small, isolated community. As a result of his recognition of the value of the voice of the general people, Aalto gave the residents a sense of dignity. A three-story multipurpose building enclosing an elevated courtyard was built by Aalto into the Säynätsalo's forested slope (Mantel, 2012). Aalto included a sizable public space as well as areas specifically for the public since it was crucial to him that the design symbolize democracy and the interaction between the people and the government.

Planning and architectural form: The design of this landmark community center was a turning point in Aalto's architectural career and was an example of his successful endeavor to embrace modernism while retaining the essence of Finnish architecture. Alvar Aalto created the multipurpose building complex, which includes a town hall, stores, a library, and apartments. Both the humanism Italian Renaissance and Finnish

Figure 5.4: Piazza Vecchia, Bergamo, Italy
Source: https://www.archdaily.com/

Figure 5.3: Saynatsalo Town Hall
Source: https://www.re-thinkingthefuture.com

folk architecture had an impact on the design of Säynätsalo's Town Hall. Aalto got his ideas for the courtyard arrangement from the Italian Renaissance. The design of this Saynatsalo Town Hall is modeled after the "Court and Tower" municipal area located in Venice, Italy. The center court is surrounded by a U-shaped office building and a rectangular library block. The Piazza Vecchia in Bergamo has a similar layout to the library and civic activities facing the center area. By putting soil dug up for the building's foundation into the center area, the court is raised above the natural site level. The center courtyard is raised one story above the surroundings thanks to the two structures serving as a retaining wall that allowed Aalto to fill it with earth dug up from the site's slope. The courtyard is accessible to the public through the openings between the two buildings, which also allow the low northern sun to enter (Shukla, 2022). The council chamber, a double-height (17 m) structure that is flooded by natural light through lattice work and topped by the Aalto-designed "Butterfly" trusses, is the crowning feature of the town hall. The ceiling and roof are both supported by trusses, which also create ventilation to control heat in the summer and condensation in the winter. Multiple intermediate trusses are not necessary thanks to the butterfly truss. It also evokes classical and medieval styles. A ramp that circles the main tower construction and passes beneath a row of clerestory ribbon windows is used to access it from the main entrance hall, which is located one floor below.

The building alters depending on the viewing angle because of the undulating masses. This represents "*Movement*" in contemporary architecture. This difference in elevations produces two different impressions of the building depending on whether one is inside the courtyard or seeing from the outside. Outsiders notice an imposing two-storey exterior that is mostly made of monolithic, unadorned brick, in contrast to the adjoining library and office buildings' one-story facades, which are

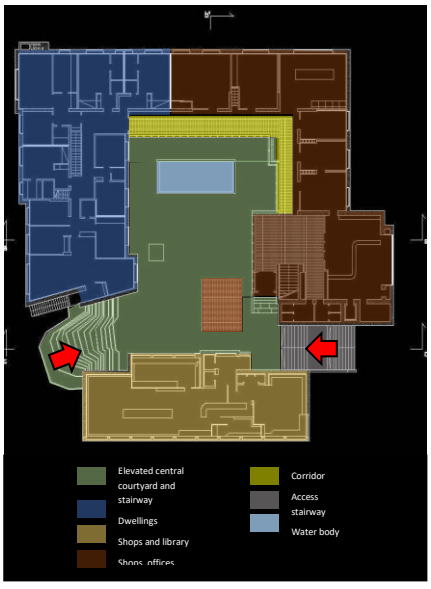


Figure 5.5: Saynatsalo Town Hall site plan
Source: https://www.allcadblocks.com/

just one level tall inside the courtyard. The principal block's sudden climb and towering, mountain-like rooftop establish the center, which is already at the highest point in town, as the seat of authority and power. The two staircases that lead from the ground level to the courtyard also differ in design. Two levels of the formal, rectilinear eastern staircase are made of flawlessly hewn granite. Instead of being made of stone or brick, the western staircase is made of terraced sod that is pushed back by wooden boards and has a more asymmetrical footprint. One is transported back to Finland's rocky topography as they ascend the sod-filled staircase that is enclosed in wooden planks. These grass stairs complement a regular set of stairs next to the tower council chambers, and the growth of a shape approximating a basic amphitheater condition on them also evokes ideas of ancient Greek and Italian architecture (Koner, 2020). When one arrives at the courtyard, the landscape's immersive character becomes more pronounced. Overlooking the library building's single story, the trees loom large. The conversation with the surroundings changes as seen from the courtyard.

Relation with nature: A solitary body of water to cool one's feet serves as a reminder of the numerous lakes throughout Finland. The court and forest's luxuriant foliage pair beautifully with the red brick facades. The courtyard seems as an extension of the forest outside thanks to the vertical struts in the fenestrations, which replicate the rhythm of the forest. The brick façade's power is broken by the glass doors. This

Figure 5.8: brick envelope punctuated by periods of vertical striation
Source: https://www.re-thinkingthefuture.com

Figure 5.6: Courtyard view from circulation
Source: https://www.re-thinkingthefuture.com

Figure 5.7: Vertical struts in fenestrations
Source: https://www.re-thinkingthefuture.com

courtyard circulation area, which is covered in glass, wears a transparent disguise and represents "Simultaneity" in contemporary design. It is no longer a nearly Orwellian governmental hub, but rather open to the public. The doors to the municipal buildings and the public library open into the courtyard, which can serve as both an open circulation space and a public gathering place for the benefit of the entire town. There is a lot of glazing in the main lobby and the hallway that runs down two of the courtyard's sides, which heightens the sense of openness to the public (Fiederer, 2016).

Light: There is a semi-public circulation area in the area behind the glass doors. Light seeps into the library and offices through this transition area. In the hallway leading to the council chamber, the impact is the opposite. The light from the clerestory and a small staircase in this dimly lighted hallway serve as navigational aids.

Figure 5.9: Council chamber lit by large window with lattice work

Source: https://www.re-thinkingthefuture.com

Materials: Alvar Aalto employed dark red brick to draw attention to the regional industry. The floors also featured wooden, copper, and stone flooring. Aalto rejected the Machine Aesthetic for the majority of his architectural works, even though he worked alongside other Modernist architects like Le Corbusier at the same period. He viewed his structures as complex creatures made up of several cell types. This idea guided Aalto's use of conventional construction materials like brick, which is cellular by nature. The bricks were even slightly off-line in order to create a dynamic and alive surface condition because of the shadows, which gave the walls a range of hues. The Flemish bonds and sunken mortar give the façade a tactile character. Periods of vertical striation in the shape of wood columns, which reflect Säynätsalo's location in a densely forested environment, are interspersed with the huge brick

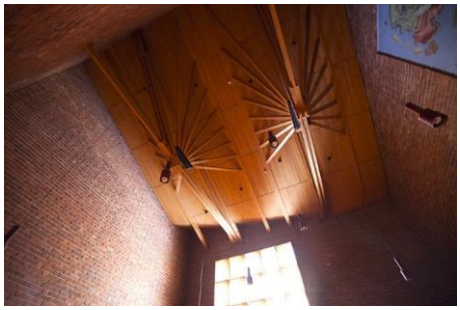


Figure 5.10: Butterfly truss supports roof of Council Chamber

Source: https://eardleydesign.com/

envelope. The building's main program is contained within a thick brick exterior, but the courtyard is surrounded by a glass-enclosed circulation area that is modeled after an arcade-bordered piazza.

Despite appearing to be humorous, the Saynatsalo Town Hall stands out for its integrity in design. not just in the components but also in the way the spaces change to suit the purpose while being faithful to the location. There is no excess of any type in the structure. The richness is produced through the blending of form, materials, and elements with the psychology of the users and the place they inhabit.

Climate: For the Finnish climate, Alvar Alto defined the architectural goal of creating a "opening to the sky." The courtyard serves as an interface to produce a transitional microclimate in the majority of climates. This microclimate serves as a transition zone between the arid exterior environment and the more temperate, cozy, or even pleasurable interior. In the Northern, colder temperature, the courtyard must be enclosed, or protected, in order to be protected. As a result, the adjacent structure serves as its own interface, or climatic membrane (Passe, 2012).

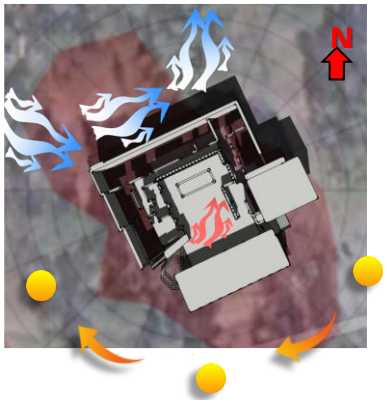


Figure 5.11: Solar noon shadow on summer solstice

It has been noted that “courtyard employs as ingenious natural cooling strategies in hot climates (Raydan et al’s Courtyards: A Bioclimatic Form, 2006)” (Passe, 2012, p.5), Aalto made sure they could function as "geniuses warming strategies" in colder climates as well. The Town Hall is surrounded by a vast elevated green courtyard. Despite this, the low height to area ratio protects the inside from winds while allowing the low angle of the Northern sun to enter and warm the entire interior. The raised courtyard is oriented roughly 30 degrees away from North but is still sufficiently wide to allow sunlight to enter even during the low spring and fall angles, increasing the number of warm days in the courtyard. A protected area is created by the closed Northwest corner, tilted orientation, and additional wind protection measures. While still allowing for natural airflow from the warmed inner courtyard via the corridor's circulation space into the offices, the courtyard generates a microclimate.

5.2 Dhakhwa house

Figure 5.12: Dhakhwa house
Source: cosynepal.lodgify.com

Dhakhwa house is restored, 108 years old house. Located in the historical center of Patan, the house is about 500m West of Mangalbazzar and 500 East of Patandhoka, is nested in a courtyard nearby Nagbahal and the Golden Temple. The building is an ancestorial house of Mr. Prakash Dhakhwa. Although he is devoted to handicraft business profession wisely, being a local resident of core Patan, he has so strong attachment to local traditional architecture. So, he along with his school classmate, Jitendra Shrestha is devoted in restoration and preservation of traditional houses in core Patan. For this, Jitendra Shrestha owns a company named "Cozy Nepal", which has restored number of traditional building and converted them into homestay for promoting tourism in Patan.

Building history and restoration

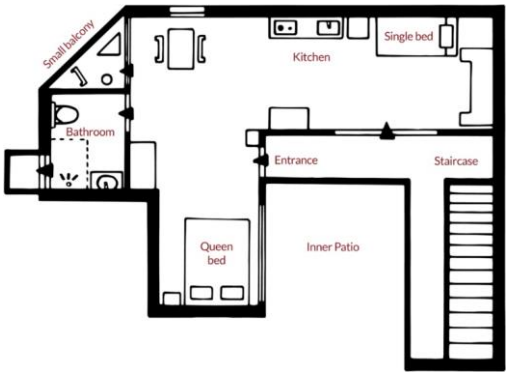


Figure 5.13: Loft (Home stay) plan
Source: cosynepal.lodgify.com

Once, this century old house was totally neglected by Dhakhwa family for more than 10 years. They moved to Bauddha and had their handicraft business there. Currently, this family lives in Satdobato and this traditional house has been converted to tourist guest house. The abandoned house was restored in 2012 AD, in traditional way with minimal interventions as far as possible. Ar. Saurav Shrestha assisted in the process. At this today's time of people's affinity towards modern concrete building, Dhakhwa decided on restoring his old house. He got so many negative comments during the process. At one time, even he himself got frustrated on own decision but today looking at his restored house, he is so satisfied.

Modifications on building

a. Architectural expression

This 4 storey house portrays typical authentic Newari architecture. In contrast to typical rectangular newari house, C – shaped plan of this house includes private courtyard, which was used only as Saa: gaah, for washing clothes and for making Raksi. Additionally, the house is connected to two other residential courtyards, in West and South. Main entry of the house is through Western courtyard. Front façade has only one single window and balcony space, in each floor. The balcony space is added later during restoration, where there was staircase earlier. Entering through low height main door of 5'-0", one reaches the 3 bayed Dalan space where guests are welcomed. This Dalan space opened up to private courtyard. Space to the North of Dalan is used as store. Staircase block at North was also the part of the building, which was destroyed during 1934 AD earthquake and later added as metal structure to house staircase during restoration in 2012. First floor includes kitchen/ dining area and a guest room with attached toilet. Second and third floor are identical, developed as studio apartment with a toilet and small kitchen space. Floor height is of only 6'-7", except the top floor of 7'-2". The interesting thing about the house is, two façades of the private courtyard have 3 bayed full height windows in all floors. First and second floor has its own old wooden window whereas top floor has 3 bayed UPVC window. These large windows illuminate the interior space with ample of natural light.

Figure 5.14: *Dalan* space overlooking private courtyard

Source: field visit

Figure 5.15: Blend of traditional and modern construction

Source: cosynepal.lodgify.com

Figure 5.16: Loft (Home stay) interior

Source: cosynepal.lodgify.com

Façades are beautiful blend of brickwork, brick work with surkhi pointing and plastered wall with off-white paint.

b. Structural expression

Dhakhwa house is a restored old traditional Newari house. So, the building is a load bearing structure. The structure has 24” load bearing wall in ground, first and second floor, whereas 18” wall in third floor. During restoration, the building is structurally retrofitted with metal framing from inside. Additional structures such as balcony, staircase block and passages are of metal structure. In order to reduce load of the floor, thick mud flooring is replaced with 2” concrete over metal decking. In ground, first and second floor, decking has been done over existing closed spaced wooden rafters (Dalin), whereas top floor contains metal Dalin. Major intervention done is removal of the traditional slope roof with flat 2” slab over metal deck.

Figure 5.17: Metal structure for staircase block
Source: field visit

Figure 5.18: View of courtyard from top floor
Source: field visit

Each floor have given floor specific name such as Chheli - the ground floor, mātan - the first floor, chvata - the second floor and baiga, the attic. It indicates that the vernacular Newar architect did thought of houses beyond the four-storey as there is no floor specific name given as such. Even the Royal Palaces of Malla kings are of three or four storied. Over the time, rising of additional floor came into existence and is simply called pyatan, mean "fourth floor" which lies just below the attic. Gradually

tendency of making terrace on the fifth floor came into existence amongst the nobilities and better off families. A Newari folk song "Nyātajāgu kahsi chonā bakhun boyekā kena re, bakhun boyekā kyongu makhu mana boyekā kyonare" which means pigeons has been flown from the fifth floor terrace, it is not the pigeons but it was showing off flying oneself to impress (someone), indicates symbol social status to have a terrace at fifth floor (Maharjan, n.d.). Respecting the value of traditional Newar house of 4 storey, initial plan of adding fifth floor completely of metal structure was not implemented. Here affinity towards culture wins over economic aspect.

Current building use

Gentrification and its negative impact on core settlement is the driving force for restoring old houses by owner itself and converting them to homestay. Dhakhwa sees no point in selling or renting out traditional old house and moving out of the community to fringe area because he believes that the value of such heritage can only be truly understand by its local user.

Today, the house functions as tourist accommodation, with direct friendly and homely interaction with owner. Based on experiences and reviews, he suggests and assist others also to restore their old houses to tourist accommodation because Dhakhwa believes that, tourist wants to explore the culture of here. Instead of staying in star hotels, they prefer such local accommodations. Dhakhwa remembers Ar. Yori Antar of Indonesia and his great satisfication on his stay at Dhakhwa house. Antar stayed here after his stay at Hotel Hyatt and Dwarika. Antar is an Indonesian modern architect who is so dedicated in promoting Indonesian traditional architecture.

Dhakhwa believes that tourist only need comfort (sleeping, well communication and cleanliness) instead of star hotel amenities such as gym, swimming pool, sir/maam greeting. But it doesn’t mean compromising on quality of service. Through friendly and homely environment, they can learn more about our culture. So, here in Dhakhwa house, guests participate in kitchen experience with owner, Raksi making, etc. He also organizes alley and interconnected courtyard tour to the guests. Dhakhwa house only accepts short term guests (staying maximum 2 weeks) in contrast to other guest houses accepting long term guests (let’s say 6 months). He wants more guests to experience the place within a year, at reasonable price.

Continuity of traditional architecture or towards modern???

Dhakhwa also agrees going with modern trend and technology but also insist on respecting local traditional values. He points out that norms and bye-laws needs to address properly on conservation and promotion of traditional architecture. In case of core settlement, amenities might be changed but at least there should be no modern façade. To meet the modern demand, modern material can also be incorporated. Here in Dhakhwa house also, sun burnt brick is removed, mud mortar is replaced with cement, mud flooring is replaced with 2" concrete, metal structure is incorporated in where ever needed. He also keeps him updated about the modern construction materials and modern fixtures, for using in upcoming projects so that modern comfort can be achieved and at the same time, authentic traditional architecture is also not hampered.

5.3 Taragaon complex, Carl Pruscha, 1964

Figure 5.19: Taragaon complex
Source: https://www.bing.com/

After democracy was established in Nepal, many technical aid projects from different nations and international organizations arrived, but Nepal had little experience developing modern building kinds. When the contemporary trend in architecture and the rest of the world was booming, Austrian architect Carl Pruscha spent the most of his professional career researching and working intensively in the area of regional architecture in the eastern globe, an area that was being disregarded. He was one of the foreign architects who the UN sent to Nepal in 1964 to advise the government as an authority. Although his job had initially only been for a year, it was later increased to ten. He was engaged in a variety of public and private ventures throughout his stay. One of the earliest examples of contemporary architecture in Kathmandu is the Taragaon complex in Bouddha, which was designed by him. He had a thorough understanding of the various facets of the valley's architecture and reinterpreted it in his designs to create the valley's current architectural language.

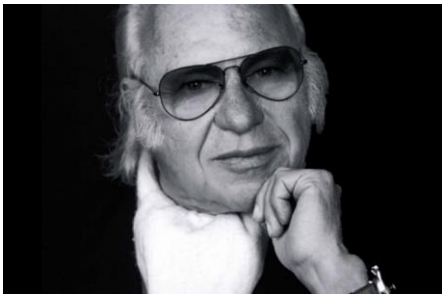


Figure 5.20: Carl Pruscha

Architect's autobiography, academic and design inspirations: Carl Pruscha, who was born in 1936 in Innsbruck, Austria, attended the Vienna Academy of Fine Arts from 1955 to 1960, where he studied under Lois Welzenbacher and Roland Rainer. He graduated from Harvard Graduate School of Design with a Master of Arts in Urban Design in 1964, and in 1965 he arrived in Nepal to serve as a United Nations advisor for eight years. In 1978, he joined the Academy in Vienna as a professor of the foundations of planning and building research following a teaching assignment in the USA. He served as vice chancellor from 1988 to 2001 before assuming the position of chair for habitat, environment, and conservation, which he held until his retirement in 2004 ("About Carl Pruscha",2016). He joined a group of five young architects after completing his postgraduate studies at Harvard to work on an urban planning project for the development of Downtown Manhattan (Battery Park, which included the future World Trade Center), but he soon returned to school to begin a dissertation on planning in developing nations. Wallace Harrison had invited the group to participate in the project. He was able to gain access to the university's library and UNO archives. He feels that because of its compactness, ancient architecture accurately depicted large-scale real-world architecture because he is an avid student of history. He sees the progression of the urban fabric in a medium-sized town that is directly adjacent to the countryside and by highlighting such settlements where the local supply of the city should be ensured, meaning no lengthy transport routes for the goods that are urgently needed by the city, but the cities were then specifically intended for certain functions, such as production or in research or whatever just the focus of this respective this each city is filled with. Additionally, the buildings themselves that we see today were already there, or the volumes were just flexible space constructs with changing functions rather than symbolic structures with lovely facades or other ornamental components.

Working with Harrison, Bernard Rudofsky presented "A short introduction to Non-Pedigreed Architecture," which was a component of the exhibition "Architecture without Architects," and which had a profound impact on him. Austrian architect

Rudofsky was born in Moravia in 1905. It was obviously too early for truly innovative architecture, thus he decided to look to the history of faceless architecture for fresh directions. His mentor Eduard Sekler advised him to travel to Nepal instead of Tibet because the Chinese government at the time did not accept UN experts there. He was very eager to visit Tibet. Professor Edward Sekler of Harvard University was studying urban areas and the quick changes industrialization was bringing about when he traveled across India in 1962. He came to Nepal during his tour on the advise of a friend to see the distinctive and pristine terrain of the nation. He understood the benefits of an unbroken urban form and the importance of planned development and the preservation of the area's historic character. Carl Pruscha was motivated to spread the word about what he witnessed in Nepal and what was possible for its future because he brought back to Europe a lot of memories ("Carl Pruscha",2017). led Pruscha to the then-paradise valley of Kathmandu as a consultant for the UN. After relocating to Kathmandu, he produced urban designs and research devoted to Nepal's heritage preservation and his interest in Himalayan Vernacular architecture, regionalism, and traditional architecture grew. In a similar vein, Mary Slusser, who was born in November 1918 and graduated from Columbia University with a doctorate in anthropology and archaeology, was entranced by the monuments, the stupa, the temples, the clear skies, and the low buildings that loomed on the horizon. This fascination led to her involvement in the culture, history, and art of this amazing location. She was the first western academic to study architectural typology and architectural details when she first visited Nepal in 1965. Her writings, which appeared in Artibus Asiae from 1972 to 1979, were crucial to the understanding of Newar art and architecture. The astonishing cultural diversity of the Kathmandu Valley was finally made available to western readers in Nepal Mandala - A Cultural Study of the Kathmandu Valley (two vols., 1982) (Slusser, 2017).

Carl Pruscha’s assignment was first limited to 1 year, but was extended to 10. He began working on Nepal's physical regional planning as soon as he arrived in the valley. His contribution was primarily focused on the creation of the Kathmandu Valley master plan and assisting Nepal in compiling a comprehensive inventory of the valley's historical and cultural landmarks. Analyzing the space was the first step in the process of providing the government with spatial planning advice. The extent of the settlements is never too far from flowing water, which means that they are never too large to operate

beyond the natural boundaries recognized by their residents. Instead, they should be founded as a new subsidiary settlement once they have reached their maximum practicable use, meaning that all the elements he had previously considered in his utopian ideas about a modern city (or future cities) are present here on a very small scale. The inventory was released in two volumes with the aid of a survey after several years. With the assistance of the Austrian government, the inventory was published in two volumes after several years of surveying, serving as the foundation for UNESCO's designation of the Kathmandu Valley as a World Heritage Site. **"Kathmandu Valley: Preservation of the Physical Environment and Cultural Heritage, a Protective Inventory"** was the report's title. Soon after, Professor Sekler joined together with UNESCO to create the project's master plan, known as the **"Conservation Master Plan of the Cultural Heritage in the Kathmandu Valley"** ("Carl Pruscha",2017). The book also includes a **"Physical development plan for the Valley",** which is possibly its most intriguing feature because it goes beyond simply choosing cultural heritage sites to project a vision for the Valley's future centered on a "multi-nucleated growth pattern," in which urbanization is pushed to the Valley's periphery, allowing fertile agricultural land to be used (Acharya, 2017). Pruscha took a pragmatist romanticist approach, which has been on the minds of all Valley planners and architects, whether domestic and international. But it is touching to observe how for generations, the pioneers and locals had been motivated by this pragmatist romanticism to mix beauty and sophistication in their towns and home designs ("Pruscha's Kathmandu Valley", 2016).

Pruscha was particularly motivated to work here as an architect because, in addition to spatial planning, he is also interested in the preservation of cultural assets. His ideas regarding the preservation and advancement of the existing architectural tradition inspired him to design his own small house in Bansbari using raw wood and puzzled brick as local building materials. Here, he made an attempt to give the home a distinct expression than Nepalese charm and demonstrated how a modern home can be transformed into something else. He also had the opportunity to create a home for the foreign minister to host visitors and diplomats from the West. In order to plan a house that was constructed using these basic materials by the local craftsmen, he kept a large tree in the middle of a courtyard there. He demonstrated that it is also feasible to accomplish this while appreciating conventional techniques, which he views as a

commendable effort. Pruscha also collaborated on the Government Center Master Plan with Louis Kahn and the Lumbini Project with Kenzo Tange as a planner.

The Tribhuvan University's Centre for Economic Development, founded in 1970 with the help of Jorgen Rahbeck Thomsen, has a close connection to the Valley's natural environment, geography, and history. The building's horizontal lines and terraces match the site's terraced fields, and the brick and wood used in its construction are typical materials used in Nepalese architecture. One of Pruscha's earliest constructed works was the first to successfully combine a modern structure with a distinctly Nepalese aesthetic. He was fascinated by the rich traditions, history, and traditional architecture of the valley, and he reinterpreted all those elements in his design to give the valley a modern architectural approach. His plan for the CEDA building was an attempt to keep the structure's current character while blending the physical, cultural, and spiritual surroundings of the valley. He built an eight-story structure on top of the terrace environment that already existed, seamlessly blending into the surroundings to give the impression that man-made nature has continued inside the structure. Bricks were the only option left for him because they had long been a popular building material in Asia, giving Kathmandu Valley its distinct place among other Asian towns. Louis I. Kahn, whose exposed brick structures in Dhaka, Bangladesh, and Ahmedabad, India, had gained international fame, also had a significant influence on Pruscha. Kahn had paved the way for critical regionalism in South Asia with his use of traditional materials in modern structures. Pruscha was therefore eager to influence Nepal. Here, he discussed the spiritual tradition of architecture, namely the revival of the fundamental shapes of the triangle, square, and circle using the circle as a symbol of religion. Pruscha created the floor plan to represent the abstract symbol of the mandala, drawing inspiration from the geometry of the mandala with its circle and square. The conference room is in the circular, whereas the administrative area is square in shape. Since this isn't a strictly spiritual structure, the circle is made to be open. It is positioned axially toward Swayambhu, from which it might make a spiritual connection. As a bridge between the square and the circle, the third complex of the structure was given a triangle shape. Its purpose was to provide accommodations for the guests ("Carl Pruscha",2017). Mr. Zenon Zielinsky, a structural engineer at the time employed by the Ford Foundation in Calcutta, made a contribution by creating a unique prefabrication technology for concrete panels that eliminated the need for wood for ceilings and floors ("Carl

Pruscha",2017). The structure was constructed in Kathmandu during the early modern era, but it adopted a post-modern aesthetic that embodies context, harmony with nature, and the resurrection of historical context to foster a sense of regionalism.

Taragaon complex in 1971, the construction of a small hostel for artists and scientists who spent a lot of time in the field in the valley and didn't want to live in a typical tourist hostel, and a hostel was set up for them that he also set up in a form the astra that was aware of tradition in the way it was built, with the materials, and it still has one of these circular ones that conveyed their own expression [music] titles vault also are immediate in the area of one of the great places of worship, Bouddha. During his time in Nepal, he came to the realization that, in addition to his various experiences, he would also be taking something with him when he returned to his native country. He thinks he was successful in creating culturally particular structures in Nepal, but he still considered this to be his own language that he created through experience and intended to be developed more generally to allow for implementation possibilities (Herbst, 2005).

“Architecture isolated from its cultural, social, and discursive context didn't hold any appeal for him”. He focused his scholarly work on researching vernacular architecture and city planning in underdeveloped nations, "getting back to the roots." He spent his time in Nepal working to raise awareness of the value of fusing regional and international architecture. not just fixing it, but also giving it a new life. He put into practice and demonstrated his best theories on how these traditional building methods from the Himalayas could harmoniously meld with contemporary design (Pintos, 2021).

After living in Nepal for nearly ten years, Carl returned to Vienna and spent the next ten years instructing architecture at the Academy of Fine Arts. For a further twelve years, he served as the University of Arts' rector. After retirement, he accepted a six-month research scholar position at the Getty Institute in Los Angeles as the head of Studio for Habitat, Environment, and Conservation. This investigation led to the creation of the paper with the working title "Himalayan Vernacular." In addition, he has positions as honorary professor at the Technical University of Vienna, chairman of the Austrian committee of the arts, and member of the Senate of the Academy of Fine Arts ("Carl Pruscha",2017).

"Architect Carl Pruscha is unusual. His artwork can be found in Vienna, Kathmandu, and New York. These three geographical regions, which were far apart from one another, had a significant impact on his outlook and career. Pruscha spent the early 1960s at Harvard University's Graduate School of Design after completing his study of architecture at the Academy of Fine Arts Vienna. He was continuously looking for inspiration and visions, a good work-life balance, as well as a yearning for freedom and self-determination. Pruscha developed creative and idealistic undertakings in the US. In Nepal, where the UN had dispatched him as a consultant in 1964, he started to cope with the realities of life. The young architect developed alongside the challenge of adjusting to this alien culture. He also designed magnificent buildings that merge history and modernism in perfect harmony with their natural and landscape surroundings, in addition to intricate development projects for the Kathmandu Valley. In 1974, when he returned to Vienna, he started to actively engage in social and academic issues. The man-about-town bohemian rose to prominence in Vienna's architectural scene as the Academy of Fine Arts' rector"(Natalie Lettner, 2020).

Design context: Carl Pruscha's notable project in Kathmandu is the Taragaon complex. In 1971, Ambika Shrestha, the head of the Nepal Women's Organization, had the idea to establish a Newar village where Western tourists, including writers, artists, scientists, and those interested in religion, may stay for a while. To encourage contact among the visitors, it was crucial to build a sort of community house with a library and a small open square. Pruscha instantly objected to this idea, claiming that the family home would not be able to accommodate short-term

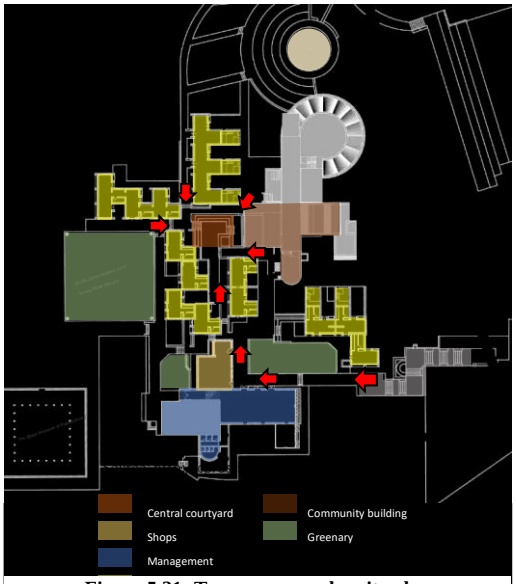


Figure 5.21: Taragaon complex site plan

guests ("About Carl Pruscha",2016). The creation of barrel-vaulted structures, which eventually became the Taragaon standard unit, was sparked by this opposing idea.

Building form: The design was influenced by the appearance and purpose of the traditional Dharmashalas, which were barrel-vaulted buildings used as "Patis" to house pilgrims within of temple complexes. It was decided to employ a brick vault rather of the pitched roofs typically seen in the valley for the communal building, and as a result, a tiny central plaza was constructed with the cluster of 16 modest units arranged around it. Prusha may have reinterpreted the round shape of the Buddha stupa nearby, just as Kenzo Tange employed a series of cylindrical brick vaults in the Lumbini Museum as "Symbolism" in his design. The complex has a structural harmony thanks to these recurring patterns. If form does really follow function, then the Taragaon Museum's fundamental form, which Pruscha refers to as his design's "prototype," can be understood as serving the same protective role that these Patis offered religious followers (Chettri, 2019). In addition to this common design, larger units have desk-like mono-pitched roofs that extend to the ground and can be opened by steps on the side. Under a single-pitched roof, it has a double-height chamber and a vaulted structure. All additional services are handled by the two bigger common buildings, which also serve as the complex's hub.

The Taragon Hotel had nearly two decades of glory after its construction, but by the 1990s, it had been neglected and abandoned. Arun Saraf, a philanthropist and businessman who established the Hyatt Group in India, offered assistance. He made the decision to turn the building into a museum for the protection, restoration, and documenting of the Kathmandu Valley's arts and traditions. The facility was eventually repaired, rehabbed, and reopened in March 2014 (Prabhakar, n.d.).

Figure 5.23: Cylindrical brick vault structure, Taragaon
Source: (2) Valerie Messini "Über Carl Pruscha" - YouTube

Figure 5.22: Lumbini Museum
Source: https://i.pinimg.com/

Material, technology and socio-cultural aspect: Here, modern Chinese kiln-fired red bricks by Pruscha—a material he picked out because of its visual and structural similarities to Kathmandu's historic Dachi brick structures—bring a Nepali quality in a very contemporary way.

The Taragaon complex today functions as a museum and includes areas for a permanent collection, a gallery of contemporary art, an exhibition hall, a café, and a management office. These buildings around the communal courtyards where events like plays, book releases, and social gatherings occasionally include art. There were numerous ways to enter the central courtyard because to the block arrangement. There is a sense of classic valley architecture planning in the low rise blocks, material selection, and interconnected areas. Standard barrel vaulted buildings provide temporary display space, whereas bigger buildings with a mono-pitched roof house permanent collections. With double and triple height spaces, the two bigger common structures include a café and a gallery/exhibition hall for contemporary art, demonstrating how Pruscha embraced a contemporary internal planning concept with increased volume.

Figure 5.25: Central courtyard
Source: https://taragaonmuseum.com/

Figure 5.24: Courtyard near contemporary art gallery
Source: https://taragaonmuseum.com/

Additionally, the use of cable support for the roof rendered the double-height room devoid of any supporting walls, demonstrating the use of a modern technique to obtain a spacious interior.

Topography: All of the components are arranged staggered and connected by stone-paved roads thanks to the site's old terraced fields ("Carl Pruscha",2017). The design of the larger unit itself mirrors the site's ongoing terraced land shape. Due to design on top of natural terrain and being surrounded by lush flora, the ambiance throughout the complex is quiet and pleasant, even though there is a heavily used road to the south. A typical unit's large circular entrance provides a visual link to the surrounding vegetation

and neighboring buildings. Due to the compact town arrangement and classic valley architecture, one feels close to nature.

Climate: The climate in Kathmandu is mild and temperate. This place doesn't get too hot or too cold. Even though the temperature does not drop significantly during the winter, traditional valley architecture was developed in response to the chilly climate. Traditional valley architecture makes good use of solar radiation in conjunction with the thermal mass of the building to maintain a suitable interior temperature.

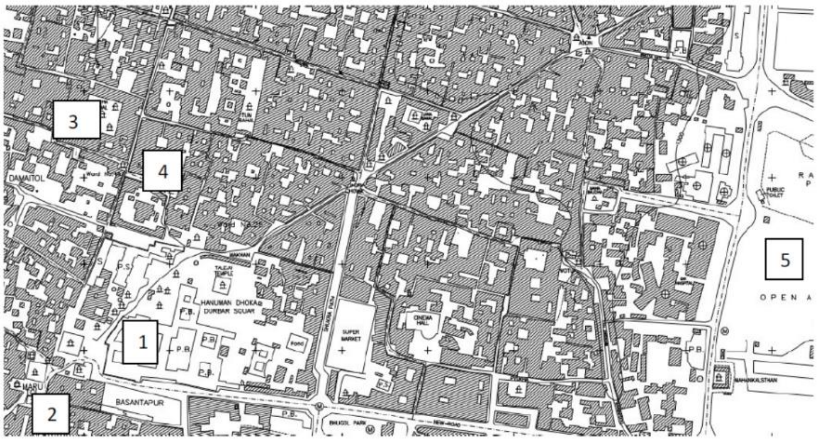
Figure 5.26: Taragaon

Brick is used for the thermal mass of building walls and even barrel vault roofs. These vaults are constructed from two brick layers placed edge-to-edge with a coating of bitumen that is readily available locally filling the space in between. The end outcome was the formation of a uniform mass of bricks that significantly cooled. Rain that penetrates the bitumen evaporates at that level, acting as a cooling agent. Ideal transverse ventilation is made possible by the open design of the rooms at both ends. Additionally, it appears that the vault constructions' North-South orientation helps to block out unwelcome glare from the West through their round openings.

Source of experience: Prucha did not just copy the style, although being greatly inspired by the art, architecture, and tradition of the valley. He had a thorough understanding of the various facets of the valley's architecture and reinterpreted it in his designs to create the valley's current architectural language. On the surface, it would seem difficult for the general public or even architecture experts to realize that the Taragaon complex symbolizes the reinterpretation of the valley's architectural style. One should be familiar with the traditional architecture of the valley to fully comprehend its architecture. The Kathmandu Valley may have seemed to people arriving for the first time as a city abandoned since the Middle Ages. In fact, the Malla Era still heavily influenced the architecture of the Valley at the time. The Ranas'

introduction of white plaster, classical columns, and Venetian windows to Kathmandu was mostly confined to their own residences and palaces. The traditional homes and residences of Kathmandu still exhibited the characteristics of the usual Malla-era Newar house. They were brick-walled, frequently more than two stories, with tiled roofs and double-pitched saddles, and their constructions were supported by brick and wood (Chettri, 2019).

The Newars primarily constructed the old settlements of the Kathmandu Valley during the Malla era, giving them their current appearance. They are definite urban settlements that are small and dense (Chitrakar, 2006; Shrestha et al., 1986). To protect the rich agricultural lowlands, several communities were built on the hills. The Malla cities' urban layout can be viewed as a thoughtful collection of exquisitely sculpted streets and squares. With a sequence of interconnecting squares or courtyards, this shows a fine-grained network of urban blocks. There is just one Durbar square in each major Malla town, although other square kinds are numerous and common, can be thought of as neighborhood public spaces, and then private home squares. These squares have been knitted into the fabric of the city in such a way that they respond to the needs of a community since they are present in every neighborhood in some way. By establishing flexible and useful spatial linkages, the concept of planning squares in relation to roadways makes them more accessible. As a result, either main streets or secondary



1. Palace Square 2. Market Square 3. Residential neighbourhood square 4. Private Residential Square
5. Open space at town periphery

Figure 5.27: Urban Pattern of traditional City (Map based on Kathmandu valley base maps 1999)

streets and lanes successfully connect each square to each other square across the town (Tiwari, 1989) (Chitrakar, 2015 ,p. 97). The linkages have frequently also been made available through the confined spaces beneath the structures.

“In a traditional settlement in Newari towns there is provision of large open spaces for public benefit. A hierarchy of public space has historically been distributed throughout the entire town, with each neighborhood being focused around a public square that is either greater or less spacious (Chitrakar, Baker, & Guaralda, Urban Growth in the Kathmandu Valley: The Transformation of Public Space, 2014)” (Joshi, 2017 ,P. 29). In Kathmandu Valley during the Malla period there was competitive stance in urban arts, crafts and religious celebrations, there were designation of hierarchies of streets and squares.

The centerpiece of "Traditional Newari Architecture" are these courtyards. Homes were clustered together and constructed around courtyards or in open areas to take use of the sunlight and provide a gathering place for residents, which heightened the sense of community. The traditional urban form's distinctive character was provided by its compact built form, the idea of mixed-use development, and design homogeneity. Building elevations were influenced by the symmetrical architectural principle, the aesthetic approach using bricks and wood, and the neighborhood's consistency of design. However, some monuments, like royal buildings, were built on a much bigger scale so that they could stand out visually. The majority of building structures were made on a standard human scale for human usage. Streets were bustling in the ancient urban form because social, religious, and cultural activities were purposefully incorporated into the physical layout of streets and streetscapes. Generally speaking, the breadth to height ratio was 1:1.5 (Shrestha, 2011a) (Catalini et al., 2018, p. 493). The historical traditional cities (Malla cities and towns) prioritized establishing a shared identity through the construction of constructed forms that served social, protective, and decorative requirements. Their extraordinary town planning standards, which were derived from the system of social and ritual planning, were generally consistent with the development of urban planning during these times. However, the introduction of the Western neoclassical form interacted with the local identity throughout the Rana regime's later historical phase. Large Rana palaces, open-fronted gardens, and majestic buildings all benefited from this period's urban form. Additionally, there were broad highways that ran axially through the palace structures (Wright, 1990; (Catalini, et al.,

2018)(p. 494). However, this just brought neoclassical architectural vocabulary to medieval buildings; it had no overall impact on any urban processes. Back then, Kathmandu was a city of strolling, full with ancient paths, and most of its water came from stone spouts. The Capital must have appeared to those who first saw it as an unusual land, a location unlike anywhere else in the globe. These eyes—foreign eyes like Carl Pruscha's—were what first captured images of Kathmandu and its surroundings, recognizing the marvel of what must have been a lovely and extraordinarily special city. The early visitors from abroad studied the Valley's culture and preserved it for future generations (Chettri, 2019).

The fact that Nepal was ruled by the autocratic Ranas until the 1950s and their love of Neo-Classical architecture (grand scaled buildings, as a way to demonstrate dominance) prevented the establishment of modern architecture in the nation. The 20th century was brought to this country when it was opened up to the rest of the world, and it was not just a Hindu kingdom on the foothills of the Himalayas that did so; it was also a century that was swiftly changing due to technology and greatly impacted by the two world wars. Nepal also made a few early forays into the modern period (Chettri, 2019). However, modernism began to flourish through government and international projects supported by technical help and foreign funding after the 1950s; this had little impact on the local context (Catalini, et al., 2018). When Carl Pruscha first arrived in Nepal, post-modernism was a relatively new movement in western nations that aimed to address the meaninglessness and lack of context in modern architecture. People have already begun to despise modern architecture. The post modernism movement may have been one of the major factors in the development of contextual modern architecture in the valley, according to the young guy at the time who liked to go into the past of nameless building to find new paths. He favored selecting native materials and utilizing them to their full potential by comprehending the setting rather than importing brand-new industrial modern elements. He interpreted the Traditional Valley Architecture into a new contextual modern way, just as Charles Rennie Mackintosh said, “Something there in past, should be interpreted in order to locate certain function of present time”. In contrast to the traditional architecture, Pruscha used clean straight lines, plain brick facades, no ornamentation, use of glass, play of light and shadow showed the characters of modern architecture in his building. So, it also truly represented the Spirit of Modern time in Kathmandu valley. Also, reinterpretation of

the valley architecture it in his designs to develop modern language of architecture in the valley represents his attempt to preserve Spirit of place. Through his works, valley got some indications about the type of modern architecture that was needed, which could be reflected in works of later foreign architects who came and worked in Nepal. He finished his doctoral dissertation at the University of Graz earlier in April 1974, summarizing his experience in planning for the Kathmandu Valley, after living there for ten years.

Summary

Table 5.1: Summary of Saynatsalo Town Hall and Taragaon complex

	Saynatsalo Town Hall	**Taragaon complex**
Intro	Alvar Aalto • Finland's most influential architect. • Modernism with regional influences and a distinctively Finnish phenomenological design philosophy. • Favored organic materials like brick, stone, or timber. • In his essay, Kenneth Frampton listed Aalto's Saynatsalo Town Hall as an example of critical regionalist architecture from the 20th century.	Carl Pruscha • An architect from Austria committed his professional life to studying and actively working in the area of regional architecture in the eastern globe. • One of the foreign architects, was sent to Nepal in 1964 by UN to serve as an expert consultant to the government. • Taragaon complex at Bouddha by him can be taken as one of the earliest modern architectural designs in Kathmandu. • Deeply understood different aspects of the valley architecture and reinterpreted it in his designs

	Saynatsalo Town Hall	Taragaon complex
Design Inspirations	• Graduated in 1921 from the Helsinki University of Technology's architecture program. • Aalto's trip to Italy cemented an intellectual connection with Mediterranean culture that would remain significant to him for the rest of his life. • Started off with Nordic Classicism + following works of Le Corbusier's modernism = Nordic Modernism • Design of Säynätsalo Town Hall was influenced by both Finnish vernacular architecture and the humanist Italian renaissance >> modernism + regionalism >> paved the way for 'Critical Regionalism'	• Studied from 1955 to 1960 at the Vienna Academy of Fine Arts. • In 1964, the Harvard Graduate School of Design offered an MA in urban design. • Struck by a presentation of Bernard Rudofsky in an exhibition, "Architecture without Architects" >> wanted to look back at the inconspicuous architecture of the past to discover new paths. • Design of Taragaon >> by appreciating the features of the Kathmandu Valley's preserved urban form and reinterpreting valley architecture into modern form.
Design Context	• Säynätsalo, a small factory town on a tiny island in central Finland's Lake Päijänne, hired Aalto in 1944 to create and implement a town plan >> Aalto triumphed in a government-mandated design competition.	• Traveled to Nepal in 1965 to serve as a UN adviser for a year >> extended to 10 year. • Primary involvement >> creation of the Kathmandu valley's master plan and assistance to Nepal in creating a comprehensive inventory of the

	Saynatsalo Town Hall	Taragaon complex
	• The complex was supposed to include a council chamber, regional government buildings, a public library, staff housing, and retail space. • Designed a building celebrating European democracy >> contained areas specifically for the public as well as a sizable public space. • Recognized the value of the voice of the general population.	valley's monuments and cultural sites. • Private project - Taragaon >> In 1971, Ambika Shrestha, the head of the Nepal Women's Organization, had the idea to establish a Newar village where Western tourists, including artists, writers, scientists, researchers, and those with a religious interest, might stay for a while. • Make an effort to preserve the modern expression of the valley's physical, cultural, and spiritual landscape.
Planning	• Courtyard arrangement- reinterpretation of Italian Renaissance	• Courtyard arrangement- reinterpretation of Newari Architecture
Building form	• The massing and design of the Venice "Court and Tower" civic space model • The Piazza Vecchia in Bergamo, which features civic programs and libraries facing the same central plaza, has a similar configuration >>	• The design was influenced by the shape and purpose of the historic Dharmashalas, barrel-vaulted buildings used as "Patis" within temple complexes to house pilgrims (C. Pruscha", 2017)???

	Saynatsalo Town Hall	Taragaon complex
	council chamber, a double-height space (17m high) • Each wing of the building was given an irregular geometry by the use of setbacks cantilevers or oblique walls so that the whole design evokes the tensions and complexity of an urban landscape	• Pitched roofs commonly found in the traditional valley architecture • Like Kenzo Tange used series of cylindrical brick vault in Lumbini Museum >> 'Symbolism' in his design gaining the inspiration from the 'Chhaitya Hall' >> Carl Pruscha might have reinterpreted circular form of Bouddha stupa nearby. • Besides this standard type (brick barrel vaulted structures), Larger units can be negotiated via steps on the side and have roofs that resemble desks and reach to the ground. • Mono-pitched roof >> in contrast to doubled pitched Traditional newari architecture • The shape mimics continuation of terraced land form of the site. • The two larger common buildings holds café and contemporary art gallery/ exhibition hall • Juxtaposition of different forms
Scale	• Civic center dedicated to a small, remote town	• Single storey brick barrel voulted units – 3.3m high

	Saynatsalo Town Hall	Taragaon complex
	• Juxtaposition of Intimate and monumental scale • Only council chamber of double- height space (17m high)	• Double height mono-pitched roof units • Central courtyard size with respect to single storey unit • Courtyard near Contemporary art gallery= 2xCentral courtyard • Double and triple height in café and contemporary art gallery
Material and technology	• Floors made of hardwood, copper, and stone showcase the local industry and go well with the dark red brick. • In order to create a dynamic and lively surface condition because of the shadows, bricks were even slightly out of line and mortar was set in a recessed position. • • Building is enveloped in a substantial brick envelope >> A glass-enclosed circulation area that surrounds the courtyard can be compared to the design of an arcade-bordered Piazza.	• Chinese kiln-fired red bricks >> Instead of Dachi brick, which has been the primary building material for many years, Kathmandu Valley has a unique position among Asian cities. • Barrel vaults are made up of one brick on edge. • 6”x6” Telia brick tile on flat and pitched roof • Stone paved paths and courtyard • Cable support in café and contemporary art gallery block for support free, open double height space, also for roof support

	Saynatsalo Town Hall	Taragaon complex
	• Designed butterfly truss, supporting both the roof and ceiling • The butterfly truss does away with the requirement for numerous intermediary trusses. >> a main beam combining the effect of 16 secondary side beams	
Typology- Socio cultural	• Civic complex for the town. • Functions >> a council chamber, neighborhood government buildings, a library serving the whole community, staff housing, and shops • Because it was intended to symbolize democracy and the relationship between the people and the government, Alto incorporated an elevated core wide public space. • By making the genius loci of the layout accessible to the general public, it helps to close the gap between the public and bureaucracy.	• Reinterpretation of courtyard planning in traditional valley architecture >> Sense of place preserved >> Sense of open-ness, familiarity • Space for social interactions >> performances, book launches and social gatherings • Multiple entry points

	Saynatsalo Town Hall	Taragaon complex
	• The western staircase has an asymmetrical footprint and is supported by wooden planks. It is built of terraced sod >> establishes a form that resembles a basic amphitheater condition, which conjures images of ancient Greek and Italian architecture (Koner 2020)	
Topography-Relation with nature	• • Säynätsalo's wooded hillside is home to a building >> surrounding an elevated central green courtyard. • The thick forest vegetation contrasts beautifully with the red brick façades. • The courtyard appears to be an extension of the forest outside thanks to the vertical struts in the fenestrations, which replicate the rhythm of the forest. • Additionally, to reflect Säynätsalo's location in a densely forested environment, periods of vertical striation in the shape of timber columns	• The site's original terraced fields allowed for a staggered arrangement of all the elements, which are connected by stone-paved roads >> Respect to existing terrain • Surrounded by lush greenery >> Closeness to nature. • Large circular glass opening >> Indoor outdoor visual connection >> Simultaneity

	Saynatsalo Town Hall	Taragaon complex
	are interspersed throughout the enormous brick exterior.	
Light	• "Considerate use of natural light has created spaces in architecture throughout history that inspire people. People are connected to the natural rhythms and the external environment through these fleeting moments in space." (McKinlay, 2015) • The building's surface is dramatically lit and shaded by the surrounding vegetation. • The building's use of direct, indirect, and diffused natural light.	• Courtyard is not fully over casted by building shadow >> Newari traditional courtyard. • Buildings' form and arrangement make beautiful play of light and shadow. • Well lit interior space with view of greenery. • Semi-open gallery space >> modern need.
Climate	• "Courtyard employs as ingenious natural cooling strategies in hot climates (Raydan et al's Courtyards: A Bioclimatic Form, 2006)" (Passe 2012, p.5), Aalto made sure they could function as "geniuses warming strategies" in colder climates as well. • The aim of the architecture was to create an appropriate "opening to the sky" for the Finnish climate.	• Warm temperate climate in Kathmandu. • Solar radiation combined with thermal mass of the building is well practiced in traditional valley architecture, to keep the indoor temperature at a comfortable level. • Homogenous mass of bricks >> wall as well as vaulted roof >> considerable cooling effect.

	Saynatsalo Town Hall	Taragaon complex
	• The low height closed Northwest corner serves as a windbreak while allowing the low northern sun angle to enter and warm the entire interior space. • While still allowing for natural ventilation from the warmed inner courtyard via the circulation area of the corridor into the offices, the courtyard produces a microclimate.	• The rooms' open design at either end makes for the best possible transverse ventilation. • North-South arrangement of vault structures >> cutting out unwanted glare from West through circular opening. • "The Newar architecture was precisely scaled for their requirements. It took in the sunlight in those spacious courtyards and the fresh air flowing through those congested lanes." (Nepalese Architecture (Newari House Architecture, n.d.)

5.4 FIELD WORK - INTERVIEWS

5.4.1 Interview 1:

Date: 05-07-2022

Time Stamp: 2:00 P.M. – 5:15 P.M.

Prof. Dr. Sudarshan Raj Tiwari

Prof. Sudarshan Raj Tiwari is an Architect & Co-Chair of Academic Council. Prof. Dr. Sudarshan Raj Tiwari, a senior conservation The architect has more than 38 years of experience instructing students in a range of architectural and urban planning topics. He has also had experience providing sporadic UNDP and World Bank consultations on project design and supervision in the areas of environment, health, and education. He has contributed to a number of studies and publications on the history of Nepali urbanization, architecture, and culture. Education: M. Arch (in Tropical Architecture from University of Hawaii, 1977); B. Arch (in Culture from TU, 1995); PhD (in Culture) (Univ. Delhi, 1973).

Insights

- While we talk about region, it's a patch of area designed by climatic characteristics. Does climate of Kathmandu qualify the valley as region? If yes, then we cannot relate Kathmandu region with whole Nepal and South Asia because Kathmandu is far more different from other Indian sub continental countries; climatically as well as socio culturally. So, not only climatically, geographically and socio culturally, Kathmandu is different.
- Historically, Kathmandu really has created its own character which can be taken as local as well as national character because apart from other cultures in Nepal, culture of Kathmandu can stand alone as a strong to identify as national culture.
- Mud and wood are the base of traditional architecture of Kathmandu, and is responsive to climate, socio cultural aspect.
- Talking about Pruscha's work in Kathmandu, Tiwari criticizes only as a blend of valley architecture's brick exposure and slope roof with modern idioms. The buildings are remarkable but he doubted about its visibility as good example of modern building, as if may be its because other architectural entities are shadowed. So, he thinks that Pruscha's building are over rated by Nepalese. He

Commented [PM1]: Climate

Commented [PM2]: Region

Commented [PM3]: Region

Commented [PM4]: Culture

Commented [PM5]: Traditional material

Commented [PM6]: Social behavior

further doubted, Pruscha being UN advisor for Kathmandu might had social status to handshake with King, in order to have different projects because King was the only personnel to plan different architectural projects. He blames Nepalese people's nature of discriminating each other for over rating foreigneers' work and over shadowing Nepalese early experts' works. We see early modern works by early architect-engineer at the time of 50s- 60s not being highlighted properly.

- Tiwari doubted Pruscha's use of Chinese brick over traditional brick because traditionally, we also have glazed bricks to perform against climate. Chinese brick production was just started at that time. So, it was difficult for general people to get access to this material. So, question rises whether brick exposure by Pruscha as his architectural creativity or its just because Chinese bricks as available material that was better than any other traditional bricks or as being foreign architect, he easily got access to use this material??
- Talking about the relevance of critical regionalist buildings, it's difficult to identify because we are so used to with iconic buildings. Tiwari talks about 2022 Pritzer prize winner African architect, Diébédo Francis Kéré. His projects are climate responsive, makes best use of local material and the buildings for the benefit of African societies. He responded to the modern materials' domination over African climate and tried to do architecture that respect African context with the use of both modern and local material. His works are simplistic but, in this simplicity, also, social, cultural, climatic performances are included.
- Brick in today's context whether new materials for local identity??? Tiwari opposes our thinking about traditional materials can't be use in modern context. It's understandable that embodied energy should be less in today's context but random use of imported materials in the name of sustainability and rapid construction, is stupid.

Commented [PM7]: Social status

Commented [PM8]: Social behavior

Commented [PM9]: Brick

Commented [PM10]: Zeitgeist

Commented [PM11]: Societal responsibility

Commented [PM12]: Traditional material

Commented [PM13]: Embodied energy

Commented [PM14]: Material use

5.4.2 Interview 2:

Date: 07-07-2022

Time Stamp: 3:00 P.M. – 5:00 P.M.

Ar. Prabal Thapa

Dipl. Ing. (Masters in Architecture) - Technical University, Vienna

Chief Architect of Prabal Thapa Architects.

Established almost two decades ago the firm has completed a range of architectural projects, including the renovation of historic buildings, the design of residential commercial as well as institutional buildings. Incorporate energy- and money-efficient sustainable design strategies into all of your initiatives. Its goal is to create a cozy, prosperous, and lasting entity.

Major projects: AMA GHAR Children's Home, JOSHI HOUSE Residence, KOPILA VALLEY Rammed-earth School, MATO GHAR Eco Residence, SWOTHA TRADITIONAL HOMES bed & breakfast, VISHUDDHI ALAYA Yoga center, KARNALI LODGE Wildlife Resort.

Insights

Climatic response

- Although Carl Pruscha had general idea about climatic idea about the Kathmandu, such as: In monsoon, it rains a lot and almost 20-degree temperature difference during winter; scale and form of the building seems important to him. Because no overhang is provided, there is problem of leakage also.
- Scale of the building with respect to surrounding. Mono pitched inclined roof >> terraced land form of the site.

Socio- cultural aspect

Commented [PM15]: Friendly climate

Commented [PM16]: Scale and form

Commented [PM17]: Site surrounding

- Division of parental house is the main cause for destroying traditional city fabric. Width of the building decreased, height and number of storey increases >> destroying scale and proportion.
- Architectural identity is affected by socio cultural aspect.
- Vernacular architecture, in response to climate, socio cultural demands and material available locally.
- Bylaws in core area >> purpose is not fulfilled. Bylaws should have purpose of maintaining cityscape. Current bylaws which allows 8-9 storey building in core area >> destroying the city scape.
- Traditional ideas to incorporate in modern planning >> certain ideas can be reinterpreted. Such as understanding the importance of courtyard, interaction spaces should be developed which strengthen relationship among community members.

Material

- Material not only helps in defining regional architecture, but also defines form.
- In modern context, preservation of local identity is a great challenge.
- Traditional brick has one problem >> not carbon efficiency
- What's so important in bigger aspect is the form itself that defines the type of material to be use

Commented [PM18]: Social behavior

Commented [PM19]: Scale and form

Commented [PM20]: Social behavior

Commented [PM21]: Traditional architecture

Commented [PM22]: Building regulations

Commented [PM23]: Modern interpretation

Commented [PM24]: Traditional material

Commented [PM25]: Scale and form

Commented [PM26]: Material use

5.4.3 Interview 3:

Date: 08-07-2022

Time Stamp: 3:00 P.M. – 5:30 P.M.

Ar. Deepak Panta

Ar. Deepak Panta is a professor (Retired) at Department of Architecture, Institute of Engineering (IOE)

Insights

- Shape of the site guides-built form and the built form should respond to the site context.
- Vault as structural system itself in Taragaon >> totally modern way of building. Hindu architecture is post and lintel type architecture, arch system brought up from Mughal architecture.
- In traditional architecture of Hindu – Buddhist architecture in Kathmandu, images of god and goddess are the decoration elements. But no human and animal form of decoration in Mughal architecture, only floral and nature – Cultural aspect
- Talking about reinterpretation of traditional brick façade, Panta thinks that Dachhi Appa with heavy decoration as façade treatment is more of caricature nature, surkhi pointed normal brick façade with clean lines and plane looks more authentic.
- Proportion and scale are the two aspects of traditional architecture, that should learn to maintain well in modern buildings also. Furthermore, building should be brought down to human scale. Taragaon complex is totally new form of architecture but looking at scale, composition and the way building has responded the central courtyard, it can be taken as new interpretation of traditional architecture.
- There was limitation on room span in traditional architecture because available timber was not of long enough length. But with modern material like concrete, early Nepali architects succeeded in breaking such limitation and incorporate new building programs in new modern buildings. With these new material, different forms like circle, square, hexagon could come in combination although such forms individually had already been in existance in traditional architecture.

Commented [PM27]: Site context

Commented [PM28]: Technology

Commented [PM29]: Modern interpretation

Commented [PM30]: Façade treatment

Commented [PM31]: Scale and form

Commented [PM32]: Historic knowledge

Commented [PM33]: Modern interpretation

Commented [PM34]: Traditional material

Commented [PM35]: Technology

Same way, Carl Pruscha also tried fusing circular vault and cuboid in Taragaon but with brick.

- Panta claims that Pruscha was the first early architect who interpreted traditional Kathmandu valley architecture into new modern way. Eventhough there were few Nepali engineers who already worked on modern structure with concrete such as Saraswati Sadan by Bed Prasad Lohani, they designed modern buildings for modern programs. Furthermore, Pruscha reintroduced exposed brick façade at the time of 1950s and 1960s, when the façade of Nepalese architecture was often whitewashed, influenced by Rana architecture. But, similar to Prof. Dr. Sudarshan Raj Tiwari, Panta also doubted, whether Pruscha used brick after Chinese brick productions started in Kathmandu or Chinese brick started manufacturing in large scale after Pruscha reintroduced brick. No matter whichever holds true, but with reintroduction of brick, he brought up new skill of English bond (Header- stretcher bond) because traditionally we only had stretcher bond (Thick wall with three layer- inner and outer kiln burnt brick and sun-dried brick as filler in between). So, brick not only reintroduced as material only, it reintroduced as new technology also.
- Panta believes that Pruscha had matured understanding of valley architecture. In similar way, he also admires Gotz Haagmueller's work such as interpretation of traditional bay window, centrally located staircase, metal fused traditional column, use of semicircular form in gallery space that pop out in external façade in Patan Dubar Square. But in the meantime, Panta also criticizes that intervention was done in wrong place, should not be done in Durbar Square.
- Talking about climatic response of Taragaon, even though overhangs are not provided, windows has been recessed in order to protect from rain. Also, provision of gutter at edge of vault is constructed in good way. But he doubted about large circular glass windows which might be responsible for large amount of heat loss during cold winter night, making indoor space significantly cold.
- Lastly, for region specific design, building should be able to tell story satisfying given condition of context, program and client.

Commented [PM36]: Modern interpretation

Commented [PM37]: Zeitgeist

Commented [PM38]: Technology

Commented [PM39]: Traditional architecture

Commented [PM40]: Modern interpretation

Commented [PM41]: Genius loci

Commented [PM42]: Modern interpretation

Commented [PM43]: Climate responsive

Commented [PM44]: Energy

Commented [PM45]: Context

5.4.4 Interview 4:

Ar. Arun Dev Panta

Date: 10-07-2022
Time Stamp: 4:00 P.M. – 6:00 P.M.

Chief Architect of Design Cell Pvt. Ltd

Major projects: Chandragiri Hills, Hotel Mulberry, Atithi Resort & Spa, Olgapuri Village, Shangrila Village, Hotel Crowne Imperial, Chitwan Medical College, Mountain Glory Resort, Kathmandu World School, Krishna Tower.

Insights

- Site and context define the organic pattern of the Nepalese settlement. No strong regular rigid geometrical form and pattern found in Nepalese historical settlements.
- Also looking through the settlement pattern of hilly areas, layout of settlements follows up terraces and contours of hill. So, there is strong relation between Nepalese settlement pattern and topography.
- For his Shangri-La Village Resort project in Pokhara, he studied a small compact hill settlement, Birethanti where houses are attached to each other and also following the hill topography. Because the site for the project was limited, he gathered knowledge from similar compact settlement in hill >>

Reinterpreting Historic knowledge

- Master plan of Barahi Jungle Lodge, shaped by site boundary, river, terrain.
- Carl Pruscha, Kenzo Tange used vault but it's difficult to maintain and it became alien form for Nepal. Except, its good example of experimenting contemporary form.
- Contextualizing the site is important. Developing modern forms everywhere destroys the urban fabric.
- Different layer of architecture seen in traditional Kathmandu itself. Earlier, what rulers used to do, people also copy. Example: Neo classical embellishment in people's house. Panta claims that fusion of Newari and western classical architecture brightened the Newari house. Aspirations of local people to put up regional identity.

Commented [PM46]: Context
Commented [PM47]: Traditional architecture
Commented [PM48]: Relation with nature
Commented [PM49]: Relation with nature
Commented [PM50]: Modern interpretation
Commented [PM51]: Relation with nature
Commented [PM52]: Scale and form
Commented [PM53]: Context
Commented [PM54]: Social behavior
Commented [PM55]: Façade treatment

- Beautification of the façade with dacchi appa in the name of Newari architecture >> even worse than pop art. Surkhi pointing is for residential, dacchi appa for temple form.
- Human scaled projects are automatically successful. Kathmandu World School >> planning and massing with respect to site terrain. Building not as one large thing, rather break down to small scale. Brick is used at suitable places, for contextualization with proper protection and overhang.
- Going horizontal as much as possible for Kathmandu's context. He opposes the idea of tall tower structure in the name of preserving green area.
- Terrain defined street model in Nepali context >> quite harder to plan in modern context.
- Influenced by Gorden Colen's "Serial vision concept". As we walk down the street, we see partial glimpses as we turn on corners. Durbar square of Kathmandu are also in same concept. So, if we can serialize our vision in context and each component of vision should be equally good, it defines different form and mass.
- Temple tree >> tried to create urban oasis >> small village of Pokhara within very limited area of site. Idea is to control foreground with own building element with view of Machhapuchhre in background and at the same time blocking surrounding visible waste pipe of surrounding 3-4 storied building –

Understanding site context

- About Carl Pruscha's work >> Truly modern attempt in Nepal, breakup of forms in Taragaon. CEDA building geometrically fine, but totally out off context. Scale is large. Too much of a pure form. In isolation, it's a beautiful building. Charles Correa also finds it beautiful and had it in list to see during his visit to Nepal. Some of Pruscha's smaller residential buildings, much better answers for modern Nepal. Taragaon is more acceptable because it is broken into smaller fragmented pieces, feels more in context and appropriable.
- Kenzo tange's Lumbini museum and Pruscha's CEDA are larger scaled place making projects which need enough space but as a guide, such leveled projects are difficult to implement in Kathmandu because we don't have such level of scale.
- Starting point by foreign architects in modern Nepal is really appreciable. Other examples: Narayan hiti, Lab school, Sano Thimi campus.

Commented [PM56]: Façade treatment

Commented [PM57]: Scale and form

Commented [PM58]: Brick

Commented [PM59]: Modern interpretation

Commented [PM60]: Context

Commented [PM61]: Culture

Commented [PM62]: Traditional architecture

Commented [PM63]: Modern interpretation

Commented [PM64]: Site surrounding

Commented [PM65]: Modern interpretation

Commented [PM66]: Scale and form

Commented [PM67]: Scale and form

Commented [PM68]: Zeitgeist

- For modern urban context, constructing large building is not a big deal, leaving large open space, plazas is great thing >> taking clue of durbar square as a public space.
- Modern development in any city should be carried out understanding its context. Eg: Sports city favourable for Pokhara.
- Kathmandu as a cultural city, new development??? We cannot develop courtyard spaces in modern days until housing company or government planning initiatives take it up. Community space development is a different thing. In traditional settlement, there are layers of spaces. Street and public gathering squares as public spaces. Hierarchy of open spaces with respect of security purpose also >> Own house > Private courtyard > Semipublic Street > Public squares. Now it's not possible to create such layer of safety ness and modern development also do not go for such layering. So, what's the point of recreating? Safety ness in present context is individual house with compound wall. Addressing the changing demand, think for what we are designing.
- Sign of development of contemporary building that could be taken as example representing Kathmandu context?? Rarely but some to extend improvements can be seen. Example of Labim mall, earlier horrible Lalitpur bishal bazzar building developed into happening space. Inside outside concept >> public domain of traditional architecture can be felt. Segregated volume, use of brick and contemporary modern material. Site had its own restriction, developing site with already built large building. This challenge made the project successful. Early Kathmandu's existing challenges has developed such great spaces and urban form in the valley. Labim mall is a contemporary example, how challenges created by already existing building guided new addition. So, the site itself guided succession of the project.
- Other examples: Russian culture center, interesting enough. It got enough complexities to blend in urban kiosk. Contemporary big building but has broken up the big rigidity. Sanchyakosh building of Thamel. Even though the building might has primary motive of economy generation, Bibhuti Man Singh has created plazas, level that blend with Thamel.
- Answer to the selection of new material - "I want to make building that last generations." It's stupid going for American style 30-year life span building

Commented [PM69]: Societal responsibility

Commented [PM70]: Context

Commented [PM71]: Planning

Commented [PM72]: Present social need

Commented [PM73]: Modern interpretation

Commented [PM74]: Present social need

Commented [PM75]: Scale and form

Commented [PM76]: Material use

Commented [PM77]: Traditional architecture

Commented [PM78]: Modern interpretation

Commented [PM79]: context

Commented [PM80]: Scale and form

Commented [PM81]: Present social need

Commented [PM82]: Modern interpretation

Commented [PM83]: Strength

with modern light weight prefab materials, showing negativity towards brick building that last 7 generations.

- Traditional technology – much more ecofriendly system. A level of water absorption is needed to strengthen local material. This also make building climate responsive.
- For climatic aspect in modern context also - passive technique of natural ventilation is effective. Building orientation for cutting off excessive glare but heat gain is ok for winter.
- Thakali styled modern residential building in Budhanilkantha made Panta realize to design in context. The contemporary museum gallery type courtyard house is beautiful enough that international magazine "Architecture Digest" wanted to cover, but the problem lies there. This surkhi pointed brick building got no overhang, so water spashes all over. Similar problem in Taragaon also, no overhangs.
- Although neo classical building era has got history in Kathmandu, Panta points out those building to be out of context, socio culturally and climatically also. Those building so large in scale and have got no overhangs. Water gets seepage from roof and over the time, building got collapsed from top down.
- Being valley isolated from rest of the world, the traditional valley architecture developed here is purely indigenous. Temple and building form are developed in isolation, it's not borrowed from Indian nor Chinese civilization.

Commented [PM84]: Culture

Commented [PM85]: Historic knowledge

Commented [PM86]: Climate responsive

Commented [PM87]: Climate responsive

Commented [PM88]: Orientation

Commented [PM89]: Solar

Commented [PM90]: Rain

Commented [PM91]: Overall context

Commented [PM92]: Traditional architecture

Commented [PM93]: Region

5.4.5 Interview 5:

Ar. Bibhuti Man Singh

Date: 20-07-2022
Time Stamp: 4:00 P.M. – 6:00 P.M.

Bibhuti Man Singh is the Chief Architect of Technical Interface in Thamel and a 1972 graduate of the West Pakistan University of Engineering and Technology in Lahore. She also completed postgraduate studies through a JICA-sponsored program (SONA).

Major projects: Park Village Resort, Club Himalaya, Himalayan Bank in Birgunj, Himalayan Pavilion in Hanover - Expo 2000 and was commended with a Plaque from the Society of Consulting Architectural and Engineering Firms. Bibhuti Man Singh talks to Ivan Sada of his obsession and his various projects.

"No architect can be completely contemporary or classical; his creations always react to particular environments. The setting could be as straightforward as music or as intricate as philosophy. Therefore, if people perceive me as being more traditional than other architects, it's possible because my projects required a traditional approach. I haven't made any conclusions about my policies and I don't have any plans to choose between the conventional and the modern." – Ar. Bibhuti Man Singh

"As I demonstrated in my project with the Dwarika Hotel, architectural design must respond to the setting. Because it was a unique project that did not require extensive investigation of possibilities or speculating on what architecture should be, my position there was less creative than it had been with my other projects. They had ancient traditional objects that required a context. I had no control over the context or setting that the old architecture required. The outcome is what you can see now as a result. In that regard, I must admit that the process was tedious even though the outcome was well received. However, the client deserves the most of the credit for the work that was done there, not me. It was not feasible without his collection of antiquities. The "body pieces" of the design, such as the classic architecture's century-old columns, windows, and doors, were already in place. Perhaps the only innovative element that went into

the endeavor was the need to somehow revive them and place them into living quarters."

He is extremely self-critical of his own work and believes that "the best is yet to come." The architect believes that the Health Ministry building in Ram Shah Path, designed by Louis Kahn, is worthy of mention especially since "some of the architecture is both aesthetically pleasing and functionally effective." The Lumbini Development Trust designed by Kenzo Tanga is another work that Bibhuti Man thinks is exceptional. About newer architects in Nepal, he thinks that some of them are indulging in 'postmodern excesses' and are designing buildings with no regard to logic or rationale.

Why can't modern structures reflect Nepali architecture?

In addition to the high cost of Nepali building, we must uphold its customs and traditions. But to preserve the historic atmosphere and art, we could extract whatever we can at a low cost and incorporate it into contemporary architecture. The actual traditional atmosphere of Nepali architecture might be seen and felt in a group of dwellings rather than in a single residence.

Insights

- With globalization modern architecture has ignored context, but it's not good. It goes against the very purpose of architecture. It should spring from site regarding its local fabrics. Singh strongly disagrees with architects who goes totally out of context, in order to satisfy personal narrative story. He gives example of Santiago Calatrava's railway station, which Singh thinks that Calatrava narrates the projects as a big bird coming down to settle down on big plaza. There is no other concept, the structure can be place anywhere is other region also.
- Singh also agrees, the unornamented brick structure Taragaon represents modern style of building in Kathmandu. His choice for brick is a revival of traditional valley architecture but at the same time he thinks, concrete would have been stronger and more water proof on vault of Taragaon structures. Instead, these vaults are made of two layers of brick on edge, with layer of locally available bitumen in between.
- Although, Prof. Sudarshan Raj Tiwari and Prof. Dr. Sushil B. Bajracharya found traditional Newari buildings to be climate responsive, Singh doesn't think

Commented [PM94]: Societal responsibility

Commented [PM95]: Context

Commented [PM96]: Modern inerpretation

Commented [PM97]: Material

Commented [PM98]: Strength

Commented [PM99]: Technology

climate as a strong determinant of form in Kathmandu. Climate of Kathmandu has been so kind to us. Singh further adds, the research findings about traditional architecture are their interpretation.

- Singh believes that traditional architecture springs out of un-self-conscious decision. It's a long process of improvisation over generations. He compares traditional architecture with Charles Darwin's theory of biological evolution: *"All species of organisms arise and develop through the natural selection of small, inherited variations that increase the individual's ability to compete, survive, and reproduce."* So, if Pruscha self consciously had understood the valley architecture and reinterpreted in modern way, then Singh thinks credit should be given to him.
- Physical context should be given top priority and then other context such as socio-cultural, material, philosophical, etc. follows. It's the responsibility of architect to choose up to which level of context s/he wants to plug into. Singh remembers about Club Himalaya's site on top of hill with 270-degree exposure to mountain as a strong stimulus to the project.
- There are so many determinants for contextual modern architecture. Singh thinks of main 3 determinants.

a. **Ecological responsiveness**.
b. Civic aim
c. Cultural reference

- Since, language of modern architecture that respond to Nepali context has not been developed in Nepal, Singh also finds traditional Newari architecture as basepoint for Nepalese identity. Further he adds, since we are fond of external beauty of building only, it's hard to recognize critical regionalist building without in-depth study.
- Remembering his projects:

a. **Sanchayakosh building at Thamel:** Here Singh played with levels and plazas. He reinterpreted slope roof of traditional Newari architecture incorporating new function.
b. **Tangalwood Boutique hotel:** Inspired from Dwarika Hotel, client wanted fusion of traditional and modern. So, he proposed minimal ornamentation, surkhi pointed brick façade with white horizontal bands and loft with slope roof.

Commented [PM100]: Friendly climate
Commented [PM101]: Process
Commented [PM102]: Modern interpretation
Commented [PM103]: Site surrounding
Commented [PM104]: Overall context
Commented [PM105]: Site surrounding
Commented [PM106]: Ecology
Commented [PM107]: Societal responsibility
Commented [PM108]: Culture
Commented [PM109]: Building regulations
Commented [PM110]: Region
Commented [PM111]: Historic knowledge
Commented [PM112]: Façade treatement
Commented [PM113]: Modern interpretation
Commented [PM114]: Present social need
Commented [PM115]: Façade treatment
Commented [PM116]: Modern interpretation

c. **Dwarika Hotel:** Personally, Singh himself is not proud of the project. Singh says, it doesn't include any site context and agrees to have provided setting for client's collection of old traditional doors, windows and columns only.

- In this modern age, Singh agrees going with modern trend but the roots to our cultural reference should not be forget.

Commented [PM117]: Context

Commented [PM118]: Context

CHAPTER 6. FINDINGS AND DISCUSSION

6.1 Taragaon - Climatic analysis using Autodesk Ecotect Analysis 2011

A building can use natural energy and the advantages of the local climate to maintain its operational energy consumption by designing it with that environment in mind. So, in order to find the basic local climatic condition of Kathmandu, weather data from Department of Hydrology and Meteorology (DHM) is analyzed. Based on the findings of climatic studies and research into the traditional architecture of the Kathmandu Valley, the following fundamental rules are adhered to.

a. The climate analysis showed that the Kathmandu Valley's year-round comfort range is between 20.5°C and 26.5°C.
b. The valley's best orientation advises placing structures facing south to catch the low-angle winter sun. i.e., a building with a long façade facing South and an East-West orientation. In order to receive the most solar radiation in the winter, buildings should be oriented 5 degrees east of south; this is a good option for passive solar heating.
c. Maximum wind flow throughout the year, according to wind analysis, is between 10 and 20 km/hr from the west.

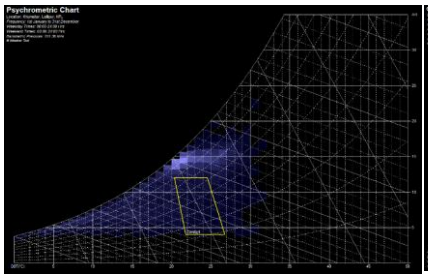


Figure 6.3: Comfort range for Kathmandu

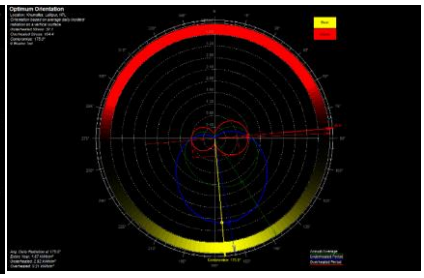


Figure 6.4: Best orientation for Kathmandu

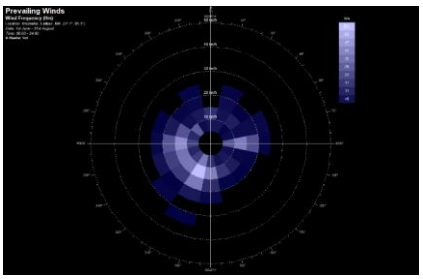


Figure 6.2: Prevailing wind in Kathmandu (Summer)

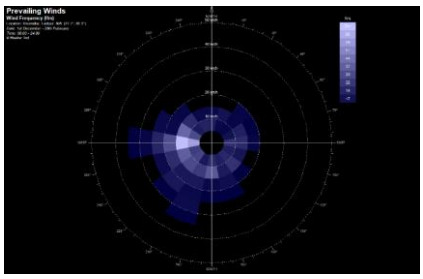


Figure 6.1: Prevailing wind in Kathmandu (Winter)

Figure 6.5: Google earth view of Taragaon, Hotel Hyatt Regency and Bouddha Stupa
Source: Google earth

From observation, it is found that the whole Taragaon complex is oriented 15.5 degrees West of South. So, there is 20.5 degrees of difference between site condition and best orientation suggested as per weather data. Hotel Hyatt Regency to the North of Taragaon complex is also oriented in same angle. It seems that the building responded to East boundary of the site, considering Bouddha stupa as view.

Figure 6.6: Taragaon complex 3D model

However, only 2 out of 5 smaller units have their longer façade facing south to receive the maximum solar radiation.

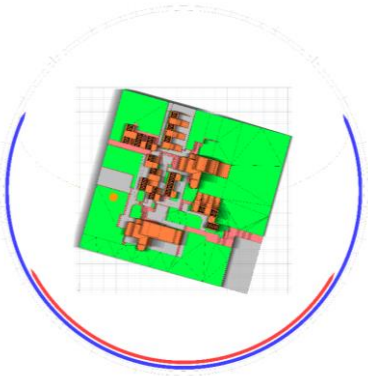


Figure 6.11: Shadow range on summer solstice
Source: Ecotect_Taragaon energy modelling

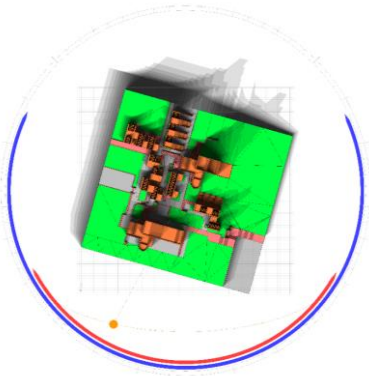


Figure 6.10: Shadow range in winter solstice
Source: Ecotect_Taragaon energy modelling

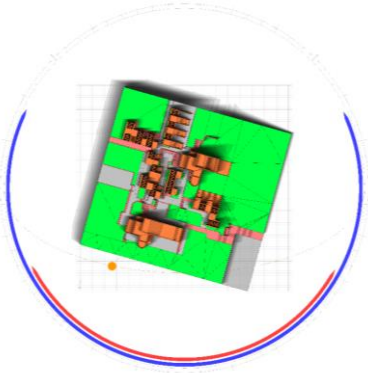


Figure 6.9: Shadow range on equinax (March 21)
Source: Ecotect_Taragaon energy modelling

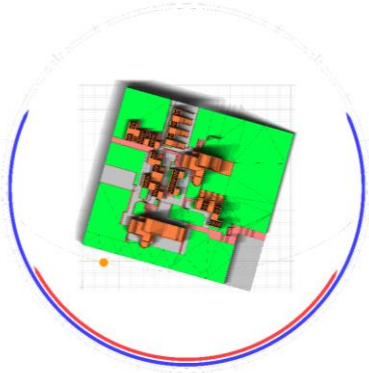


Figure 6.8: Shadow range on equinax (September 23)
Source: Ecotect_Taragaon energy modelling

Simulation of one smaller unit (longer façade facing south) is done in Autodesk Ecotect Analysis 2011. Taking comfort range between 20.5°C to 26.5°C and under the condition of natural ventilation. Wall and vault roof of 9" brick masonry. Circular opening of 6mm standard glass. Following observation were taken.

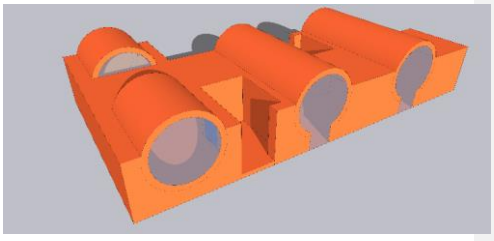
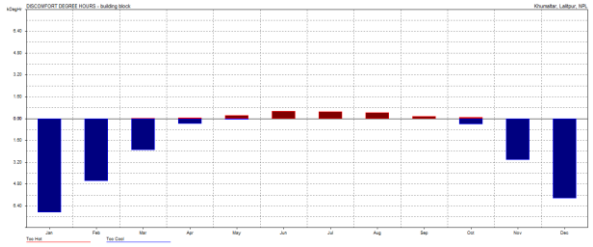


Figure 6.7: Taragaon, smaller unit at NE

6.1.1 Simulation results

- **Normal condition**



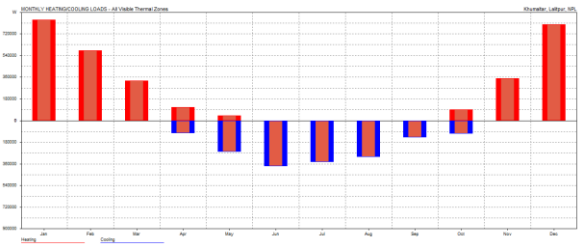
DISCOMFORT DEGREE HOURS

All Visible Thermal Zones
Comfort: Zonal Bands

MONTH	TOO HOT (DegHrs)	TOO COOL (DegHrs)	TOTAL (DegHrs)
Jan	0	6879	6879
Feb	0	4581	4581
Mar	0	2312	2312
Apr	48	390	439
May	214	96	310
Jun	536	0	536
Jul	506	0	506
Aug	422	0	422
Sep	144	0	144
Oct	77	420	497
Nov	0	3049	3049
Dec	0	5861	5861
TOTAL	1947.1	23588.8	25535.9

Figure 6.12: Discomfort degree hour

From the simulation, it is found that in existing condition with natural ventilation in all visible thermal zones, January and June are the most discomfort months with 6879 DegHrs and 536 DegHrs respectively



MONTHLY HEATING/COOLING LOADS

All Visible Thermal Zones
Comfort: Zonal Bands

Max Heating: 6824 W at 06:00 on 18th February
Max Cooling: 4491 W at 14:00 on 30th May

MONTH	HEATING (Wh)	COOLING (Wh)	TOTAL (Wh)
Jan	835093	0	835093
Feb	582008	0	582008
Mar	329126	0	329126
Apr	109040	107804	216844
May	42122	261311	303433
Jun	0	378982	378982
Jul	0	344345	344345
Aug	0	303006	303006
Sep	0	140852	140852
Oct	89580	111730	201310
Nov	350809	0	350809
Dec	799151	0	799151
TOTAL	3136928	1648030	4784959
PER M²	69595	36563	106158
Floor Area:	45.074 m2		

Figure 6.13: Monthly Heating/Cooling Loads

With mixed-mode system, results show maximum heating is needed in February with heating load of 6824W whereas maximum cooling is needed in May with cooling load of 4491W.

- **Optimization – 20.5 º Orientation change (best orientation- long side facing 5 degrees East of South)**

With 20.5º clockwise offset of North (best orientation), it is found that, with natural ventilation in all visible thermal zones, the discomfort degree hour in January is reduced to 6876 DegHrs (0.04% reduced) and the discomfort degree hour in June is reduced to 532 DegHrs (0.75% reduced).

From passive gain breakdown calculation, with 20.5º clockwise offset of North (best orientation), the result shows that maximum heat loss through external fabric remains same i.e. 60.6% and internal heat gain increased to 49.1% (1.66% increased)

With 20.5º clockwise offset of North (best orientation) and mixed-mode system, results show that heating load needed in February remains same i.e. 6824W whereas cooling load needed in May is reduced to 4461W (0.67% reduced)

Table 6.3: Discomfort Degree Hours (North offset 20.5º)

DISCOMFORT DEGREE HOURS

All Visible Thermal Zones
Comfort: Zonal Bands

MONTH	TOO HOT (DegHrs)	TOO COOL (DegHrs)	TOTAL (DegHrs)
Jan	0	6876	6876
Feb	0	4579	4579
Mar	0	2306	2306
Apr	50	392	441
May	220	96	316
Jun	532	0	532
Jul	503	0	503
Aug	421	0	421
Sep	143	0	143
Oct	76	412	488
Nov	0	3042	3042
Dec	0	5856	5856
TOTAL	1944.9	23558.9	25503.9

Table 6.3: Passive gains breakdown (North offset 20.5º)

GAINS BREAKDOWN - All Visible Thermal Zones
FROM: 1st January to 31st December

CATEGORY	LOSSES	GAINS
FABRIC	60.6%	2.2%
SOL-AIR	0.0%	26.4%
SOLAR	0.0%	14.8%
VENTILATION	22.8%	1.0%
INTERNAL	0.0%	49.1%
INTER-ZONAL	16.6%	6.4%

Table 6.3: Monthly Heating/Cooling Loads (North offset 20.5º)

MONTHLY HEATING/COOLING LOADS

All Visible Thermal Zones
Comfort: Zonal Bands

Max Heating: 6824 W at 06:00 on 18th February
Max Cooling: 4461 W at 13:00 on 15th July

MONTH	HEATING (Wh)	COOLING (Wh)	TOTAL (Wh)
Jan	848549	0	848549
Feb	590514	0	590514
Mar	330796	0	330796
Apr	109384	106484	215868
May	44768	270955	315723
Jun	0	382183	382183
Jul	0	344092	344092
Aug	0	300481	300481
Sep	0	135897	135897
Oct	89599	101935	191534
Nov	356893	0	356893
Dec	812875	0	812875
TOTAL	3183380	1642028	4825407
PER M² Floor Area:	70626	36430 45.074 m2	107055

6.1.2 Summary

Table 6.4: Summary sheet of simulation of Taragaon

	Normal condition	**20.5 º Orientation change – Best orientation**
Discomfort Degree	6879 DegHrs in January. 536 DegHrs in June.	0.04% reduced in January. 0.75% reduced in June.
Monthly Heating/Cooling Loads	Heating load of 6824W in February.	Heating load remains same.

	Normal condition	20.5 º Orientation change – Best orientation
	Cooling load of 4491W in May.	Cooling load 0.67% reduced in May.

6.2 Dhakhwa House - Climatic analysis using Autodesk Ecotect Analysis 2011

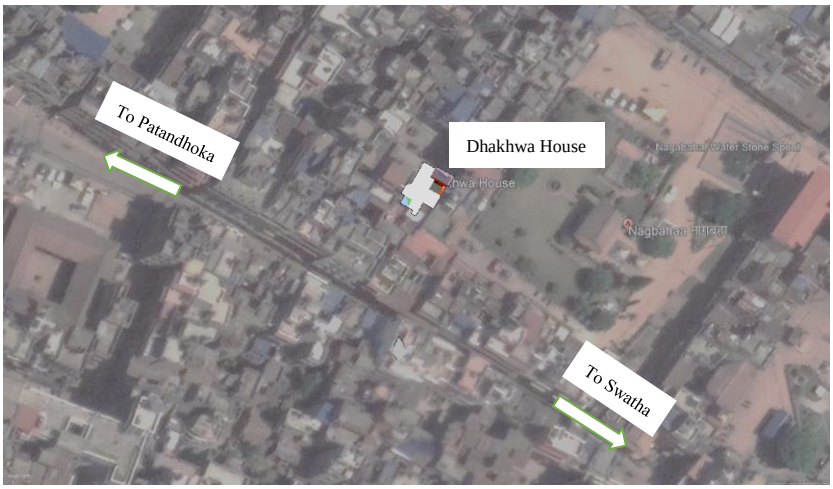


Figure 6.14: Google earth view of Dhakhwa House
Source: Google earth

The building is C- shaped with private residential courtyard within. From observation, it is found that, the longer face of Dhakhwa House is oriented 60.5 degrees East of South. So, there is 55.5 degrees of difference between site condition and best orientation suggested as per weather data. Indeed, the existing orientation of the building is guided by alignment of plot itself inside traditional core settlement.

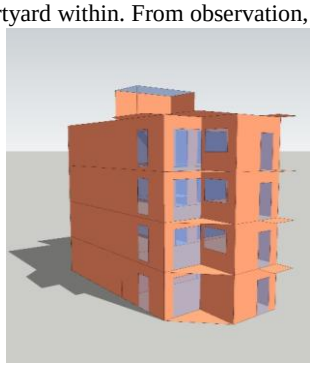


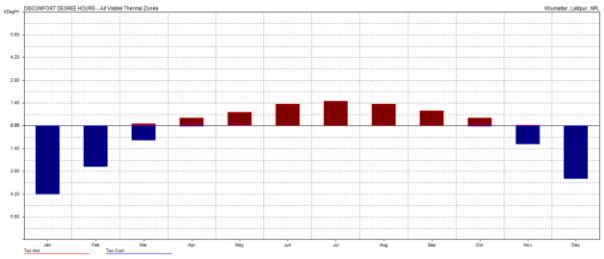
Figure 6.15: Dhakhwa House 3D model

Simulation is done in Autodesk Ecotect Analysis 2011. Taking comfort range between 20.5°C to 26.5°C and under the condition of natural ventilation. Wall thickness of 24" in ground,

first and second floor, 18” in third floor, 3” concrete floor over 1” timber planks and opening of 6mm standard glass. Following observation were taken.

6.2.1 Simulation results

- **Normal condition**



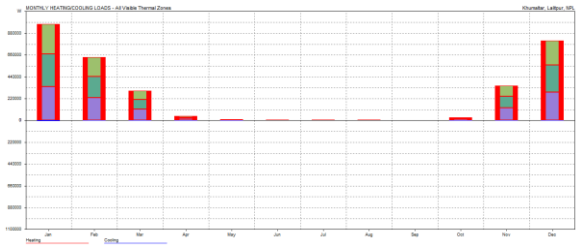
DISCOMFORT DEGREE HOURS

All Visible Thermal Zones
Comfort: Zonal Bands

MONTH	TOO HOT (DegHrs)	TOO COOL (DegHrs)	TOTAL (DegHrs)
Jan	0	4212	4212
Feb	7	2520	2528
Mar	121	898	1019
Apr	495	42	537
May	828	3	832
Jun	1330	0	1330
Jul	1525	0	1525
Aug	1352	0	1352
Sep	918	0	918
Oct	497	42	539
Nov	37	1141	1177
Dec	0	3262	3262
TOTAL	7111.1	12119.6	19230.7

Figure 6.16: Discomfort degree hour

From the simulation, it is found that in existing condition with natural ventilation in all visible thermal zones, January and July are the most discomfort months with 4212 DegHrs and 1525 DegHrs respectively



MONTHLY HEATING/COOLING LOADS

All Visible Thermal Zones
Comfort: Zonal Bands

Max Heating: 5595 W at 01:00 on 3rd January
Max Cooling: 0.0 C - No Cooling.

MONTH	HEATING (Wh)	COOLING (Wh)	TOTAL (Wh)
Jan	973905	5615	979521
Feb	640339	3035	643374
Mar	298582	896	299477
Apr	43046	75	43121
May	13337	12	13349
Jun	5936	0	5936
Jul	6505	0	6505
Aug	6046	0	6046
Sep	4511	0	4511
Oct	32202	6	32208
Nov	348190	917	349107
Dec	805278	3871	809148
TOTAL	3177877	14428	3192304
PER M² Floor Area:	10381	47 306.124 m2	10428

Figure 6.17: Monthly heating/ cooling load

With mixed-mode system in first, second and third floor (Accommodation area), results show maximum heating is needed in January with heating load of 5595W whereas no cooling is needed.

- **Optimization – 55.5º Orientation change; East façade with private courtyard facing best orientation (best orientation- long side facing 5 degrees East of South)**

With 55.5º clockwise offset of North; East façade with private courtyard facing best orientation and natural ventilation in all visible thermal zones, there is no significant change in the discomfort degree hour. In January, it is reduced to 4206 DegHrs (0.14% reduced) and the discomfort degree hour in July remains same.

Table 6.6: Discomfort Degree Hours (North offset 55.5º)

DISCOMFORT DEGREE HOURS

All Visible Thermal Zones
Comfort: Zonal Bands

MONTH	TOO HOT (DegHrs)	TOO COOL (DegHrs)	TOTAL (DegHrs)
Jan	0	4206	4206
Feb	6	2515	2521
Mar	117	895	1012
Apr	494	42	535
May	828	3	831
Jun	1328	0	1328
Jul	1522	0	1522
Aug	1350	0	1350
Sep	917	0	917
Oct	491	43	534
Nov	33	1136	1169
Dec	0	3254	3254
TOTAL	7086.3	12093.2	19179.4

Table 6.5: Monthly Heating/Cooling Loads (North

MONTHLY HEATING/COOLING LOADS

All Visible Thermal Zones
Comfort: Zonal Bands

Max Heating: 5604 W at 01:00 on 3rd January
Max Cooling: 0.0 C - No Cooling.

MONTH	HEATING (Wh)	COOLING (Wh)	TOTAL (Wh)
Jan	971159	5551	976711
Feb	638360	2983	641343
Mar	298619	870	299489
Apr	43363	73	43436
May	13377	12	13389
Jun	5941	0	5941
Jul	6508	0	6508
Aug	6050	0	6050
Sep	4510	0	4510
Oct	32295	5	32300
Nov	342646	866	343512
Dec	798330	3794	802124
TOTAL	3161158	14154	3175312
PER M² Floor Area:	10326	46	10373
	306.124 m2		

With 55.5º clockwise offset of North and mixed-mode system, results show that there is no significant change in the heating load needed in January i.e. 5604W (0.16% increased) whereas no cooling load is needed

- **Optimization – 235.5º Orientation change; West main façade facing best orientation (best orientation- long side facing 5 degrees East of South)**

With 235.5º clockwise offset of North; West main façade facing best orientation and natural ventilation in all visible thermal zones, discomfort degree hour in January is reduced to 4177 DegHrs (0.83% reduced) and the discomfort degree hour in July remains same i.e. 1525 DegHrs.

Table 6.7: Discomfort Degree Hours (North offset 235.5º)

DISCOMFORT DEGREE HOURS

All Visible Thermal Zones
Comfort: Zonal Bands

MONTH	TOO HOT (DegHrs)	TOO COOL (DegHrs)	TOTAL (DegHrs)
Jan	0	4177	4177
Feb	9	2488	2496
Mar	120	871	991
Apr	492	38	530
May	826	3	829
Jun	1329	0	1329
Jul	1524	0	1524
Aug	1350	0	1350
Sep	911	0	911
Oct	486	33	519
Nov	33	1101	1134
Dec	0	3220	3220
TOTAL	7079.1	11931.6	19010.7

Table 6.8: Monthly Heating/Cooling Loads (North offset 235.5º)

All Visible Thermal Zones
Comfort: Zonal Bands

Max Heating: 5557 W at 01:00 on 3rd January
Max Cooling: 0.0 C - No Cooling.

MONTH	HEATING (Wh)	COOLING (Wh)	TOTAL (Wh)
Jan	972686	5624	978310
Feb	643973	3007	646980
Mar	303312	861	304173
Apr	42787	68	42855
May	13328	11	13339
Jun	5935	0	5935
Jul	6507	0	6507
Aug	6034	0	6034
Sep	4482	0	4482
Oct	32430	4	32434
Nov	351111	893	352004
Dec	804762	3853	808615
TOTAL	3187346	14321	3201668
PER M² Floor Area:	10412	47	10459
	306.124 m2		

With 235.5º clockwise offset of North and mixed-mode system, results show that heating load needed in January is reduced to 5557W (0.68% reduced) whereas no cooling load is needed

6.2.2 Summary

Table 6.9: Summary sheet of simulation of Dhakhwa House

	Normal condition	**55.5 º Orientation change – Best orientation**	**235.5 º Orientation change – Best orientation**
Discomfort Degree	4212 DegHrs in January. 1525 DegHrs in July.	0.14% reduced in January. Remains same in July.	0.83% reduced in January. Remains same in July.
Monthly Heating/Cooling Loads	Heating load of 5595W in January. No cooling load.	Heating load 0.16% increased in January No cooling load.	Heating load 0.68% reduced in January. No cooling load.

6.3 Findings from Interviews

6.3.1 Interview 1:

Prof. Dr. Sudarshan Raj Tiwari

Table 6.10: Interview coding - Prof. Dr. Sudarshan Raj Tiwari

Interviewee	Regional Attributes		Pattern		Total
	Theme	**Code**	**Appreciate**	**Criticize**	
Prof. Sudarshan Raj Tiwari	Climate	Friendly climate	1		1
		Energy			
		Orientation			
		Rain			
		Solar			
		Climate responsive			
	Spatial attribute	Region	1		6
		Culture	1		
		Social behavior		2	
		Zeitgeist	1		
		Societal responsibility	1		
		Scale and form			
		Genius Loci			
		Present social need			
	Material	Brick		1	4
		Traditional material	1		
		Embodied energy	1		

		Material use		1	
		Technology			
		Façade treatment			
		Strength			
	Topography	Site surrounding			
		Relation with Nature			
		Ecology			
	Planning	Process			
	Building regulations				
	Modern Interpretation				
	Context				
	Historical knowledge		1		1

6.3.2 Interview 2:

Ar. Prabal Thapa

Table 6.11: Interview coding - Ar. Prabal Thapa

Interviewee	Regional Attributes		Pattern		Total
	Theme	**Code**	**Appreciate**	**Criticize**	
Ar. Prabal Thapa	Climate	Friendly climate	1		1
		Energy			
		Orientation			
		Rain			

		Solar			
		Climate responsive			
	Spatial attribute	Region			2
		Culture			
		Social behavior		1	
		Zeitgeist			
		Societal responsibility			
		Scale and form	1		
		Genius Loci			
		Present social need			
	Material	Brick			2
		Traditional material		1	
		Embodied energy			
		Material use	1		
		Technology			
		Façade treatment			
		Strength			
	Topography	Site surrounding	1		1
		Relation with Nature			
		Ecology			
	Planning	Process			
	Building regulations		1		1

	Modern Interpretation		1		1
	Context				
	Historical knowledge		1		1

6.3.3 Interview 3:

Ar. Deepak Panta

Table 6.12: Interview coding - Ar. Deepak Panta

Interviewee	Regional Attributes		Pattern		Total
	Theme	**Code**	**Appreciate**	**Criticize**	
Ar. Deepak Panta	Climate	Friendly climate			2
		Energy		1	
		Orientation			
		Rain			
		Solar			
		Climate responsive	1		
	Spatial attribute	Region			3
		Culture			
		Social behavior			
		Zeitgeist	1		
		Societal responsibility			
		Scale and form	1		
		Genius Loci		1	

		Present social need			
	Material	Brick			6
		Traditional material		1	
		Embodied energy			
		Material use			
		Technology	3		
		Façade treatment	1	1	
		Strength			
	Topography	Site surrounding			
		Relation with Nature			
		Ecology			
	Planning	Process			
	Building regulations				
	Modern Interpretation		5		5
	Context		2		2
	Historical knowledge		2		2

6.3.4 Interview 4:

Ar. Arun Dev Panta

Table 6.13: Interview coding - Ar. Arun Dev Panta

Interviewee	Regional Attributes		Pattern		Total
	Theme	**Code**	**Appreciate**	**Criticize**	
Ar. Arun Dev Panta	Climate	Friendly climate			5
		Energy			
		Orientation	1		
		Rain		1	
		Solar	1		
		Climate responsive	2		
	Spatial attribute	Region	1		15
		Culture	1	1	
		Social behavior	1		
		Zeitgeist	1		
		Societal responsibility	1		
		Scale and form	5	1	
		Genius Loci			
		Present social need	3		
	Material	Brick	1		5
		Traditional material			
		Embodied energy			
		Material use	1		

		Technology			
		Façade treatment	1	1	
		Strength	1		
	Topography	Site surrounding	1		4
		Relation with Nature	3		
		Ecology			
	Planning	Process		1	1
	Building regulations				
	Modern Interpretation		7		7
	Context		5	1	6
	Historical knowledge		5		5

6.3.5 Interview 5:

Ar. Bibhuti Man Singh

Table 6.14: Interview coding - Ar. Bibhuti Man Singh

Interviewee	Regional Attributes		Pattern		Total
	Theme	**Code**	**Appreciate**	**Criticize**	
Ar. Bibhuti Man Singh	Climate	Friendly climate	1		1
		Energy			
		Orientation			
		Rain			
		Solar			

		Climate responsive			
	Spatial attribute	Region	1		6
		Culture	1		
		Social behavior			
		Zeitgeist			
		Societal responsibility	1	1	
		Scale and form			
		Genius Loci			
		Present social need	2		
	Material	Brick	1		6
		Traditional material			
		Embodied energy			
		Material use		1	
		Technology	1		
		Façade treatment	1	1	
		Strength		1	
	Topography	Site surrounding	2		3
		Relation with Nature			
		Ecology	1		
	Planning	Process	1		1
	Building regulations			1	1
	Modern Interpretation		5		5

	Context		3	1	4
	Historical knowledge		1		1

6.3.6 Summary

Table 6.15: Summary table of Interview result

Regional Attributes	Interviewee					Total	%
	Prof. Sudarshan Raj Tiwari	Ar. Prabal Thapa	Ar. Deepak Panta	Ar. Arun Dev Panta	Ar. Bibhuti Man Singh		
Climate	1	1	2	5	1	**10**	**8.55%**
Spatial attribute	6	2	3	15	6	**32**	**27.35%**
Material	4	2	6	5	6	**23**	**20%**
Topography	-	1	-	4	3	**8**	**7%**
Planning	-	-	-	1	1	**2**	**2%**
Building regulations	-	1	-	-	1	**2**	**2%**
Modern Interpretation	-	1	5	7	5	**18**	**15%**
Context	-	-	2	6	4	**12**	**10%**
Historical knowledge	1	1	2	5	1	**10**	**9%**
Total						**117**	**100%**

6.4 Discussion

"Mediating the impact of universal civilization with qualities obtained indirectly from the characteristics of a particular locality," is how Frampton describes critical regionalism. He views "architecture of resistance" as a strategy to counteract "placelessness" and the universal that emphasizes local site and environmental factors including light, topography, context, and climate. The following regional architectural characteristics can serve as the foundation for modern architecture in any country (region), according to the literature, and they serve as the best definition of critical regionalism.

- Light
- Topography
- Typology
- Context
- Climate
- Historic Knowledge
- Materiality
- Social & Cultural Appropriateness
- Technology

Figure 6.18: Word cloud representation of interview

In Nepali context, Modern architecture can be defined according to the principle of regionalism, characterized by:

- Climate
- Spatial Attribute
- Material

Literature and interview findings show that the climate in Kathmandu is mild and temperate. This place doesn't get too hot or too cold. Even though the temperature does not drop significantly during the winter, traditional valley architecture was developed in response to the chilly climate. Research findings shows that traditional valley architecture makes good use of solar radiation in conjunction with the thermal mass of the building to maintain a suitable interior temperature. Field observation of Dhakhwa House reveals that brick makes up the thermal bulk of this traditional building. Likewise, solar control considerations (such as Best fit orientation) are lacking in traditional architecture (Adhikari, 1987), it is found that, the longer face of Dhakhwa House is oriented 60.5 degrees East of South. There is 55.5 degrees of difference between site condition and best orientation suggested as per weather data. Indeed, the existing orientation of the building is guided by alignment of plot itself inside traditional core settlement.

Simulation result of Dhakhwa house shows that, even though if the building is oriented to best fit orientation, there is no significant changes in the result. The building is a traditional Newari house with private courtyard, structurally retrofitted with minimal interventions. Thermal mass of 24" brick wall provides insulation against heat loss and gain. Also, the courtyard act as a buffer zone between internal and external environment, keeping temperatures more constant. It has been noted that "courtyard employs as ingenious natural cooling strategies in hot climates (Raydan et al's Courtyards: A Bioclimatic Form, 2006)" (Passe, 2012, p.5), Aalto made sure they could function as "geniuses warming strategies" in colder climates as well. Study done by Bajracharya(n.d.) shows that traditional buildings conserve at least 1-2°C of temperature in both hot and cool seasons. But this minimal temperature difference also saves lot of energy. Each year, it helps residents save between 10% and 20% on their energy costs for heating and cooling. Hence, the simulation result, field observation and literature confirm that the traditional Newari architecture is climate responsive.

Field observation reveals that brick makes up the thermal bulk of Taragaon's building walls and even the barrel vault roofs. These vaults are constructed from two brick layers placed edge-to-edge with a coating of bitumen that is readily available locally filling the space in between. The end outcome was the formation of a uniform mass of bricks that significantly cooled. Rain that penetrates the bitumen evaporates at that level, acting as a cooling agent. Ideal transverse ventilation is made possible by the open design of the rooms at both ends. Additionally, it appears that, North-South orientation of the vault construction aids in blocking out unwanted glare from the West through their circular openings.

Similar to Dhakhwa house, simulation result of the selected block in Taragaon also shows that, even though there is slight deviation in orientation in between site condition and best fit orientation, there is no significant change in discomfort degree hour. The building is 20.5 degree deviated from the best orientation suggested as per weather data because proper exact weather data and also survey map of Kathmandu might not be available during 50s'. Indeed, the result confirms that Taragaon building which was claimed to have regional attributes, this research confirms those assumptions from climatic perspective. So, the building so far fits according to the climatic attribute of architecture regionalism for Kathmandu. Singh (2022) believes that the climate of Kathmandu has been so kind and doesn't think climate as a strong determinant of form in Kathmandu. Additionally, Thapa (2022) also accepts that the general idea about climate of Kathmandu seems sufficient for Carl Pruscha to design early modern building, also reinterpreting valley architecture. Whereas Tiwari (2022) identifies climate, geography and socio-cultural aspects as strong factors for identifying Kathmandu as region. Furthermore, Panta (2022) also has positive view on climatic response of Taragaon, saying that even though overhangs are not provided, windows has been recessed in order to protect from rain. Also, provision of gutter at edge of vault is constructed in good way.

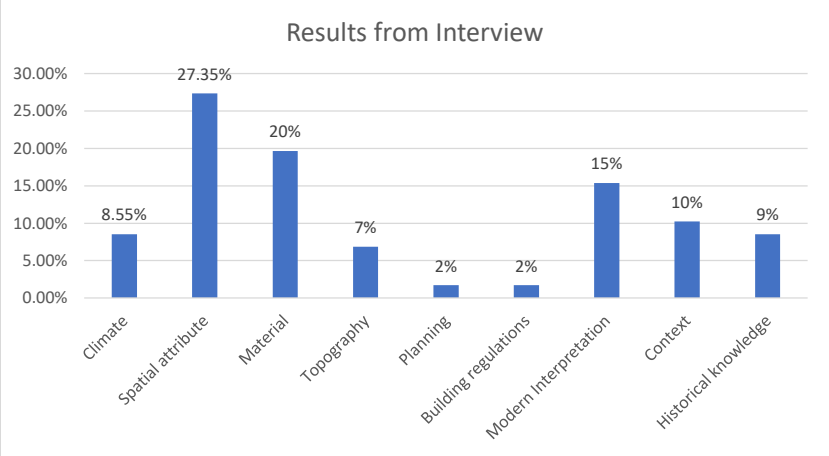


Figure 6.19: Results from Interview

Although climate is the main factor that define region, socio-cultural aspect strengthens it more. It also affects architectural identity. William J. R. Curtis is adamant that tradition should be seen as an evolution of culture and social structure that must be felt in the physical environment (OROZCO, 2011). Results from interviews identify spatial attributes (socio-cultural aspect) as most important attribute for the context of Kathmandu. In spite of the fact that socio-cultural tradition and behavior are portrayed considerably differently, architectural concepts generated from the perspective of the climate are actually almost comparable (R. S. Shah, 1985b). Strong culture can stand alone to identify as the national culture. Tiwari and Singh (2022) strongly insist Newari architecture as base point for Nepalese identity. Spatial requirement also depends on culture. Such as: Courtyard is used in multiple ways in Newari tradition. They turn into places where various age groups can interact at various times of the day and seasons: a place of worship for senior citizens in the morning; a place for housewives to wash clothes and dry their laundry in the afternoon; a play area for kids; and a gathering spot for adults to watch television and engage in conversation in the evening. Within building also, there is vertical functional division in Newari traditional house. Nevertheless, with changing time, its architects' societal responsibility to addressing changing demand. For instance: Both Dhakhwa house and Taragaon address changing time. Conversion of traditional Newari house to homestay address both changing economic as well as cultural importance of heritage building. The 108 years old house has been restored with minimal interventions to the space and material. The house

provides perfect, cozy traditional ambiance to the guests along with opportunity to tie up with the culture of valley. Whereas, Taragaon functions as museum for preservation and promotion of Nepalese art. Maharjan (2022) finds these barrel vaulted single storied structures of Taragaon best suit for exhibition and feels space & art spiritually connected. In today's urban context, Panta A. D. (2022) doesn't consider constructing large building as a big deal, but leaving large space for public is great thing. This not only emphasizes modern public space demand but also reinterprets publicness character of traditional space. Indeed, such modern reinterpretation needs scale and proportion of traditional architecture to be well maintained. Single storied vaulted structures of Taragaon surrounding the courtyard space, is proved to be the best modern from for that site. Thapa and Panta (2022) think scale and form as an important attribute for Pruscha. Since, traditional buildings are human scaled, breaking down of the modern form into human scale, makes the project feels more acceptable in the context of Kathmandu. This is why, Panta A. D. (2022) thinks Taragaon is more acceptable because it is broken into smaller fragmented pieces, feels more in context and appropriable in contrast to the large bulk of CEDA building, although done by same architect. Therefore, Panta also emphasizes on breaking down the large volume in his projects in to respect human scale character of traditional architecture. Starting point by foreign architects in modern Nepal is really appreciable but Tiwari (2022) emphasizes on not overrating foreigneers' works over works of early Nepalese experts. He thinks, the works of early Nepali engineers and architects provides better insights for development of modern architectural language in Kathmandu, that we are not being able to document properly till now.

From material aspect, the interviews and literature suggest it as an important attribute. Material not only helps in defining the regional architecture, but mostly defines the form itself. With limited use of modern materials and taking maximum benefit of modern technology, we can break limitations of traditional architecture also. But Tiwari (2022) opposes our thinking about traditional materials can't be use in modern context. The use of brick as a structural vault in Taragaon shows Pruscha not only reintroduced brick, he also brought up new skill of English bond (Header- stretcher bond) because traditionally we only had stretcher bond (Thick wall with three layer- inner and outer kiln burnt brick and sun-dried brick as filler in between). So, brick not only reintroduced as material only, it reintroduced as new technology also. Nepalese spending lifetime

savings in constructing new home, also signifies preference of material that last generations rather than American style 30-year life span building. So, for reinterpretation of mud and wood-based architecture of the valley, Panta A. D. (2022) suggests at least use of brick at suitable places, for contextualization, with proper protection and overhang; along with contemporary modern material. Dhakhwa house is the blend of traditional technology and modern metal construction technology. The structure is strengthened with the addition of metal framing from inside. Also, the additional earthy colored metal structure, that houses staircase block with solid wood flooring, adjacent to the existing house depicts truth to material. Truth to material, an approach to architecture centered on the idea that materials should be appropriate and exposed. Both Saynatsalo Town Hall and Taragaon is brick exposed representing various variable of their region. The red brick façades of Saynatsalo Town Hall complement the lush greenery of both the forest and also aimed to highlight local industries. Whereas Pruscha preferred brick over importing foreign material. Instead of Dachi brick predominant building material since many centuries, giving Kathmandu valley its unique position among all Asian towns; Pruscha used chinese kiln-fired red bricks. This helped in preserving material identity, also promoting local industries and providing greater strength to the structure. In contrast, Tadao Ando primarily works with reinforced concrete which he refers to as "smooth-as-silk" in unique ways. Furthermore, he manipulates space, light, and wind to create atmosphere through the material, shadows, and spatial design. Panta A. D. (2022) further claims that Neo classical embellishment in people's house which fused Newari and western classical architecture, had brightened the Newari house. This means proper material fusion is needed for aesthetic purpose also. But the modern materials such as steel, glass and concrete are popular nowadays and traditional materials of Kathmandu such as Newari tiles, brick etc. are declining in use. As mentioned by Sengupta & Upadhyaya (2016 p.3) while describing modern Nepali home "Town houses … use of concrete and bricks, influence of globalization and westernization" as opposed to Newari homes as "Houses of brick and tile… work; bricks as the main structural material and richly carved woodwork". It's understandable that embodied energy should be less in today's context but random use of imported materials in the name of sustainability and rapid construction, is stupid. Notably, modern culture and buildings are universally conditioned and exhaustively optimized by technology but technology should always

be adopted in such a way that it should satisfy our regional or local needs (Shirazi, 2012).

Society can easily become traditionalist or modernist, but the middle ground can become contentious. Critical regionalism aims to advance modernity while also going back to the beginning, regenerating local civilization and participating in global civilization. Because of this, incorporating certain vernacular forms into modern architectural vocabulary falls short (Doroteo, 2016) Instead, architecture should adopt a position within the vernacular forms' consciousness and be critical of them at all times. However, critical regionalism, in Frampton's opinion, seeks to strike a balance between modernity's fantasy of progress and the desire to go back in time. The concept of critical regionalism appears to be same all over, meaning to it might differ as per context. While Pruscha views it from the underdeveloped region of the world, the region of the world that has not undergone industrialization and modernism, Frampton views critical regionalism from the western point of view, the societies that have already taken the path of industrialization, have passed it, and can now look back at the times before it. He has so formed an opinion about the function that architecture serves in those communities. According to Pruscha, "regionalism is no longer perceived as a return to the traditional or as a connection to romanticism, but rather as a tool that aids people in accepting the realities of life. (Pruscha, 2004)" (Dombrovskis, 2007, p. 4)

In this modern age, Singh (2022) agrees going with modern trend but the roots to our cultural reference should not be forgotten. He reiterates physical context should be given top priority and then other context such as socio-cultural, material, philosophical, etc. follows. Architecture should spring from site regarding its local fabrics. Singh strongly disagrees with architects who goes totally out of context, in order to satisfy personal narrative story. Architecture should best use potential of the site. Surrounded by lush greenery, the town hall surrounds an elevated central green courtyard, representing democracy and the people's relationship with the government as well as nature. Similar to this, the steep 60 degree slope of the site at the base of Mt. Rokko is a distinguishing feature of Tadao Ando's The Rokko Housing Project. In order to create a "silent building standing quietly in nature," one that respects the tectonic quality of the steep mountains, Ando avoided the modernist tabula rasa technique of leveling the site. (Wu 2006). Staggered arrangement of components in Taragaon shows respect to former terraced fields of the site. As he did with Fallingwater, one of his most well-

known designs, Frank Lloyd Wright aimed to "crack the box" of Western architecture by changing geometry, letting the outside in, and creating architecture within a natural context (Anderson 2020). Primarily, contextualizing the site is important. Panta A. D. (2022) emphasizes on site and context as primary attribute that define the organic pattern of the Nepalese settlement. Vernacular architecture, in response to climate, socio cultural demands and material available locally, traditional ideas need to be incorporated in modern planning. For his Shangri-La Village Resort project in Pokhara, he studied a small compact hill settlement, Birethanti where houses are attached to each other and also following the hill topography. Because the site for the project was limited, he gathered knowledge from similar compact settlement in hill >> Reinterpreting Historic knowledge. He also takes Labim mall as contemporary building that could be taken as example representing Kathmandu context. Other examples: Russian culture center, he found it interesting enough. It got enough complexities to blend in urban kiosk. It's a contemporary big building but has broken up the big rigidity. Sanchyakosh building of Thamel. Even though the building might has primary motive of economy generation, Bibhuti Man Singh has created plazas, level that blend with Thamel. About Pruscha's work, with matured understanding of valley architecture, its truly a modern attempt in Nepal. Taragaon complex is totally new form of architecture but looking at scale, composition and the way building has responded the central courtyard, it can be taken as new interpretation of traditional architecture (Panta D. , 2022). Influenced by Gorden Colen's "Serial vision concept", As we walk down the street, we see partial glimpses as we turn on corners, Panta A. D. (2022) sees Durbar square of Kathmandu are also in same concept.

CHAPTER 7. CONCLUSION AND FURTHER STUDY

With globalization of the modern architecture, it became threat to local architecture and questions about architectural identity arose. But, in this rapid technological advancing age and peoples' affinity more towards modern needs, totally going back to vernacular is not possible. Thus, to address such issues, architecture related to society, architecture which considers community needs, context, climate, surrounding environment and also embracing modern technology becomes essential (Khader, 2016). Critical regionalism is one such approach that aims to offer modern architecture with a connection to its environment in order to convey a sense of place and significance. With Nepal opened up for modern development after Democratic Restoration in 1950, Carl Pruscha is among several foreign architects who came and worked, contributing to the modern architectural development of the country. An Austrian architect, who claimed to have blended traditional cultural, geographic, and modern contexts, gained expertise and understanding of traditional Kathmandu valley architecture, has become a crucial source of knowledge for the development of early modern architecture.

Thus, this research aimed to find the regional attributes to be considered in order to define the contextual modern architecture for Kathmandu. Since the research is located within a pragmatic paradigm, a mixed method of logical argumentation and qualitative approach is used to obtain knowledge. Also, the type of research is issue based and deals with problem identification, instrumental case study is done, taking two or more cases. Based on theories, among many regional attributes, three parameters: Climate, Spatial attribute and Material were selected to determine whether the selected cases criticize or evaluate an established theory of regionalism. These attributes were validated through multi method process such as from literature, field observation, interview with key informants, using computer simulation software.

Climate being one of the important attributes of regionalism, from the result of simulation, it can be concluded that both the buildings i.e. Dhakhwa House and Taragaon best fits with the climate of Kathmandu. There is slight deviation from best fit orientation but the result matches with suggested orientation for Kathmandu i.e., orienting buildings towards the south to receive the low-angle winter sun. i.e. long façade facing South and building aligning to East-West direction. Indeed, the study confirms that the buildings built between 50s - 90s by international foreign architects

which were claimed to have regional attributes, this research confirms those assumptions from climatic perspective. However, orientation may be different for other buildings done by famous architects here, further research needs to be carried out.

Although climate is the main factor that define region, socio-cultural aspect strengthens it more, which is also confirmed from the interview results. In the context of Kathmandu, socio-cultural and material aspect seems more valued than climatic aspect. The fact that the valley been closed to the outside world for all centuries, and all of the sudden its now opened after democracy during 1950s', the modern life makes other demands which in long run affect the socio-cultural aspect. It doesn't hold true that whatever is true hundreds of years ago, still valid today. But, still there are many things that needs to be learned from traditional architecture. So, there has to be compromise in between traditional method of doing things and advanced method of doing things, consequently not to end up in the same way as western metropolis with number of modern problems. This research result sorted out degree of importance among selected regional attributes. Moreover, it also emphasized the need of other attributes such as context, topography, historic knowledge, and modern interpretation, for the development of regional modern architecture in Kathmandu.

REFERENCES

- Acharya, K. (2017). Remembering what we've lost, from https://archive.nepalitimes.com/article/Nepali-Times-Buzz/remembering-the-kathmandu-we-have-lost,3804
- Adhikari, A. P. (1987). An approach to the design of housing for Kathmandu, Nepal.
- Askarizad, R. (2019). Influence of Socio-Cultural Factors on the Formation of Architectural Spaces (Case Study: Historical Residential Houses in Iran). *1*, 44-54.
- Bahga, S., & Raheja, G. (2018). An account of critical regionalism in diverse building types in post colonial Indian architecture. *Frontiers of Architectural Research*.
- Bahga, S., & Raheja, G. (2020). Complexities of practicing architectural regionalism in India: An interview study. *Frontiers of Architectural Research*, 568-578.
- Bajracharya, S. B. (n.d.). The Thermal Performance of Traditional Residential Buildings in Kathmandu Valley. *Journal of the Institute of Engineering, 10*, 172-183.
- Balooni, M. (2020). Significance Of Materiality In Architecture. Retrieved from https://worldarchitecture.org/article-links/efhcp/significance-of-materiality-in-architecture.html
- Bani, M. (2015). *CRITICAL REGIONALISM: STUDIES ON CONTEMPORARY RESIDENTIAL ARCHITECTURE OF KHARTOUM-SUDAN*. Paper presented at the Towards Sustainable Urban Development, Khartoum.
- Bhattarai, D. (2012). Concise History of Nepalese Architecture.
- Bodach, S., Lang, W., & Hamhaber, J. (2014). Climate responsive building design strategies of vernacular architecture in Nepal. *Energy and Buildings, 81*, 227-242. doi: https://doi.org/10.1016/j.enbuild.2014.06.022
- Catalini, A., Nour, Z., Versaci, A., Hawkes, D., Bougdah, H., Sotoca, A., . . . Trapani, F. (2018). *Cities' Identity Through Architecture and Arts: Proceedings of the 1st International Conference on Cities' Identity through Architecture and Arts (CITAA 2017), Cariro, Egypt, May 11-13, 2017*. Paper presented at the 1st International Conference on Cities' Identity through Architecture and Arts (CITAA 2017), Cariro, Egypt, May 11-13, 2017.
- Chettri, R. (2019). TARAGAON MUSEUM: WENDING OUR WAY BACK
- ARTICLE. Retrieved from https://spacesnepal.net/2015/03/19/taragaon-museum-wending-our-way-back/
- Chitrakar, R. M. (2015). *TRANSFORMATION OF PUBLIC SPACE IN CONTEMPORARY URBAN NEIGHBOURHOODS OF KATHMANDU VALLEY, NEPAL: AN INVESTIGATION OF CHANGING PROVISION, USE AND MEANING*. Doctor of Philosophy, Queensland University of Technology.
- Craven, J. (2020). Architecture Timeline - Western Influences on Building Design, from https://www.thoughtco.com/architecture-timeline-historic-periods-styles-175996
- DORJI, K. E. (2016). *IN PURSUIT OF SPIRITUALITY*. Bachelor Architecture, Montfort Del Rosario School of Architecture and Design
- Assumption University.

- Doroteo, J. (2016). Literature Review of Kenneth Frampton's "Towards a Critical Regionalism".
- Doyle, R. (n.d.). What is the relation between vernacular architecture regionalism and Critical Regionalism?
- Eggener, K. L. (2002). Placing Resistance: A Critique of Critical Regionalism. *Journal of Architectural Education (1984-), 55*(4), 228-237.
- Elahe Zoghi Hoseini, D. D., Hamed Kamelnia, Mostafa Mokhtabad. (2018). New Trends in Critical Regionalism through the Lens of Tzonis and Lefaivre. *Creative City Design, 1*.
- Elengical, J. (2022). 10 Critical regionalist architects around the world, from https://www.re-thinkingthefuture.com/know-your-architects/a3285-10-critical-regionalist-architects-around-the-world/
- Eman El Nachar, A. A.-H. (2018). *Place identity/place making in the built environment—towards a*
- *methodological perspective*. Paper presented at the 1ST INTERNATIONAL CONFERENCE ON CITIES' IDENTITY THROUGH ARCHITECTURE & ARTS, CAIRO, EGYPT.
- Erviansyah, R. (2020). The Rise and Fall of Modern Architecture, from https://rayervi.medium.com/an-essay-the-rise-and-fall-of-modern-architecture-9e0e0ce431e9
- Farah, H., & Mohammad, K. S. S. (2012). Christian Norberg-Schulz and the Existential Space. *International Journal of Architecture and Urban Development, 1*, 45-50.
- Fiederer, L. (2016). AD Classics: Säynätsalo Town Hall / Alvar Aalto, from https://www.archdaily.com/783392/ad-classics-saynatsalo-town-hall-alvar-aalto
- Frampton, K. (1983). *Towards a Critical Regionalism: Six points for an architecture of resistance, In The Anti-Aesthetic: Essays on Postmodern Culture.* Seattle: WA: Bay Press.
- Frampton, K. (1987). *Ten Points on Architecture of Regionalism: A Provisional Polemic*. Seattle: WA: Bay Press.
- Fu, C.-C. (1990). *REGIONAL HERITAGE AND ARCHITECTURE - a critical regionalist approach to a new architecture for Taiwan.* Ph.D. Architecture, University of Edinburgh. Retrieved from http://hdl.handle.net/1842/8372
- Ghinita, A.-M. (2016). How buildings influence society and how society is influenced by buildings - an introduction. Retrieved from https://www.linkedin.com/pulse/how-buildings-influence-society-influenced-ana-maria-ghinita/
- Ghodsi, H. (2012). *Vernacular Architecture: Solution to a more sustainable future.* Masters Architecture, Scott Sutherland School of Architecture. Retrieved from https://www.researchgate.net/publication/259278928
- Giamarelos, S. (2022). *Resisting Postmodern Architecture*
- *Critical regionalism before globalisation*: UCL Press.
- Groat, L. N., & Wang, D. (2013). *Architectural Research Methods*. New Jersey: John Wiley & Sons, Inc.
- Hartoonian, G. (2012). Critical Regionalism Reloaded. *Fabrications: The Journal of the Society*
- *of Architectural Historians, Australia*
- *and New Zealand*, 122-139. doi: 10.1080/10331867.2006.10539591
- Herbst. (2005). Carl Pruscha im Gespräch mit Arno Ritter im Herbst 2005.

- Hussein, D. A. E. K. (2018). THEORETICAL AND CONCEPTUAL FRAMEWORK: MANDATORY INGREDIENTS
- OF A QUALITY RESEARCH. *International Journal of Scientific Research*, 438-441.
- Hutt, M. (1994). Nepal: A Guide to the Art and Architecture of the Kathmandu Valley. *Gartmore: Kiscadale Publications*.
- Jiang, X. (2015). *Rethink critical regionalism, hot spring hotel design.* Masters Architecture, Aalto University. Retrieved from http://urn.fi/URN:NBN:fi:aalto-201602161289
- Joshi, R. (2017). *Public open space for sustainable urban development –Case study of a traditional and new settlements.* MASTERS ARCHITECTURE, TRIBHUVAN UNIVERSITY, LALITPUR. (072/MSU/216)
- Khader, J. M. (2016). The Architecture of Respecting Context and Surrounding Environment. Amman, Jordan: University Of Jordan- Department of Architecture- History and Theory of Contemporary Architecture- Arch. Dania Abdel-Aziz.
- Koner, I. (2020). Alvar aalto, from https://www.slideshare.net/IndrajitKoner/alvar-aalto-239812294?from_action=save
- Lambrecht, C. (2020). Placeless Architecture, from https://confluence.gallatin.nyu.edu/sections/research/placeless-architecture
- Lauzon, C. (n.d.). Toward a Nepalese Architecture Kingdom of Nepal.
- Maharjan, K. B. (n.d.). Traditional Newari Houses of Kathmandu Valley.
- Mantel, M. (2012). Säynätsalo Town Hall, from https://www.flickr.com/photos/mariano-mantel/26005765176
- Menon, A. K. (2016). works of architects and works of tadao ando *Critical Regionalism*: Education.
- Mills, A., Durepos, G., & Wiebe, E. (2010). Encyclopedia of Case Study Research. doi: 10.4135/9781412957397
- Natalie Lettner, M. S., Manjushree Thapa. (2020). *Carl Pruscha: Singular Personality*: Lars Müller publisher.
- Nepal, I. (2020). Inventory of 19th and 20th Century Architectural and Industrial Heritage of Nepal.
- OROZCO, J. C. (2011). *A COMPARATIVE ANALYSIS OF KENNETH FRAMPTON'S CRITICAL REGIONALISM AND WILLIAM J. R. CURTIS'S AUTHENTIC REGIONALISM AS A MEANS FOR EVALUATING TWO HOUSES BY MEXICAN ARCHITECT LUIS BARRAGAN.* Masters Architecture, KANSAS STATE UNIVERSITY, Manhattan, Kansas. Retrieved from https://www.academia.edu/6510942/A_COMPARATIVE_ANALYSIS_OF_KENNETH_FRAMPTONS_CRITICAL_REGIONALISM_AND_WILLIAM_J_R_CURTISS_AUTHENTIC_REGIONALISM_AS_A_MEANS_FOR_EVALUATING_TWO_HOUSES_BY_MEXICAN_ARCHITECT_LUIS_BARRAGAN
- Ozmen, B. (2019). Ten Points on an Architecture of Regionalism: A Provisional Polemic, from https://berilozmen.wordpress.com/2019/10/01/ten-points-on-an-architecture-of-regionalism-a-provisional-polemic/
- Passe, U. (2012, March 12th – 14th 2012). *Alvar Aalto's open plan architecture as an environmental technology device*. Paper presented at the Working papers - Alvar Aalto Researchers' Network, Seinäjoki and Jyväskylä, Finland.
- Pintos, P. (2021). Carl Pruscha, an Architect Investigating Overlooked Territories, from https://www.archdaily.com/957728/carl-pruscha-an-architect-investigating-overlooked-

territories?ad_source=search&ad_medium=projects_tab&ad_source=search&ad_medium=search_result_all

- Powell, R. (1985). *Exploring Architecture in Islamic Culture 2- Regionalism in Architecture*. Geneva: Concept Media Pte Ltd.
- Prabhakar, N. (n.d.). The Taragaon Museum: one of Nepal's first modern buildings. Retrieved from https://round-city.com/the-taragaon-museum-one-of-nepals-first-modern-buildings/
- Pruscha", A. C. (2016). Carl Pruscha, from https://taragaonmuseum.com/carl-pruscha/
- Pruscha", C. (2017). Carl Pruscha, from https://spacesnepalblog.wordpress.com/2017/01/30/carl-pruscha/
- Regionalism, C. a. E. o. C. (n.d.). Characteristics and Examples of Critical Regionalism in Modern Architecture, from https://eduzaurus.com/free-essay-samples/an-enquiry-into-the-differences-of-tradition-and-modernism/
- Sauce, E. (2015). Modernism in architecture, from https://www.essaysauce.com/architecture-essays/essay-modernism-in-architecture/
- Seamon, D. (2008). Place and Placelessness, Edward Relph. 43-51.
- Shah, B. (2016, 9 13). The Architecture of Foreign Architects in Nepal.
- Shah, B., & Pant, D. (2005). Transformation of Urban Structures in the Kathmandu Valley. *Paper presented at the International Conference for Integrating Urban Knowledge & Practice Gothenburg*.
- Shah, R. S. (1985a). Regionalism and Nepalese Architecture.
- Shah, R. S. (1985b). *Regionalism in Architecture.* Paper presented at the Regional Seminar in the series Exploring Architecture in Islamic Culture, Dhaka, Bangladesh.
- Shastri, J. D. (1959). Effect of Climate on Architectural Expression. In K. Achyut (Ed.), *Seminar on Architecture* (pp. 166-170). New Delhi: Lalit Kala Akademi.
- Shirazi, M. R. (2012). On Phenomenological Discourse in Architecture. 11-15.
- Shirazi, M. R. (2013). Critical Regionalism, Raum, and Tactility: Kenneth Frampton's Contribution to
- Phenomenological Discourse in Architecture. 8-13.
- Shrestha, B. K. S. S. (n.d.). Transformation of Traditional Building Stocks in the historic core of Kathmandu: looking through the prism of culture and climate.
- Shukla, P. (2022). Saynatsalo Town Hall by Alvar Aalto: Collaboration in Architecture, from https://www.re-thinkingthefuture.com/rtf-design-inspiration/a1849-saynatsalo-town-hall-by-alvar-aalto-collaboration-in-architecture/
- Slusser, M. S. (2017). Remembrance of things past.
- Solie, H. (2012). Theories on Architecture.
- Sonda, D., Miyamoto, H. K., Kast, S., & Khanal, A. (2018). The restoration and seismic strengthening of the earthquake-damaged UNESCO heritage palace in Kathmandu. *International Journal of Architectural Heritage, 13*, 1-19. doi: 10.1080/15583058.2018.1497229
- Tandukar, S. (n.d.). Singha Durbar. Retrieved from https://spacesnepalblog.wordpress.com/2017/11/16/singha-durbar/
- Uprety, D. S. (2020). Fusion in Architecture. In S. Nepal (Ed.).
- Valley", P. s. K. (2016). Pruscha's Kathmandu Valley, from https://kathmandupost.com/opinion/2016/06/12/pruschas-kathmandu-valley

- Wang, J. (2014). The Application of Traditional Building Materials in Modern Architecture. *Applied Mechanics and Materials, 644-650,* 5085-5088. doi: 10.4028/www.scientific.net/AMM.644-650.5085
- Whitmarsh, B. (n.d.). 'Reflecting political allegiances through the design of the Narayanhiti Royal Palace' or 'The Narayanhiti Royal Palace, Kathmandu - a view from the interior'.
- Yahya Qtaishat, K. A., Stephen Emmitt. (2018). *Towards an integrated eco-cultural regional architecture*. Paper presented at the Conference on Advances on Sustainable Cities and Buildings Development, Porto, Portugal. https://www.researchgate.net/publication/328021794_Towards_an_integrated_eco-cultural_regional_architecture

APPENDIX

Appendix 1: Coding from Interview

Interview 1:

Prof. Dr. Sudarshan Raj Tiwari

Code	Descriptions
Friendly climate	▪ climate of Kathmandu qualify the valley as region?
Region	▪ climate of Kathmandu qualify the valley as region? ▪ So, not only climatically, geographically and socio culturally, Kathmandu is different.
Culture	▪ culture of Kathmandu can stand alone as a strong to identify as national culture.
Social behavior	▪ Pruscha's building are over rated by Nepalese. ▪ Nepalese people's nature of discriminating each other for over rating foreigneers' work and over shadowing Nepalese early experts' works.
Zeitgeist	▪ Chinese brick production was just started at that time.
Societal responsibility	▪ 2022 Pritzer prize winner African architect, Diébédo Francis Kéré. His projects are climate responsive, makes best use of local material and the buildings for the benefit of African societies.
Brick	▪ Chinese brick over traditional brick
Traditional material	▪ Mud and wood are the base of traditional architecture of Kathmandu ▪ Tiwari opposes our thinking about traditional materials can't be use in modern context

Commented [PM119]: Climate
Commented [PM120]: Region
Commented [PM121]: Climate
Commented [PM122]: Region
Commented [PM123]: Region
Commented [PM124]: Culture
Commented [PM125]: Social behavior
Commented [PM126]: Social behavior
Commented [PM127]: Zeitgeist
Commented [PM128]: Brick
Commented [PM129]: Traditional material
Commented [PM130]: Traditional material

Code	Descriptions
Embodied energy	▪ It's understandable that embodied energy should be less in today's context but random use of imported materials in the name of sustainability and rapid construction, is stupid.
Material use	▪ It's understandable that embodied energy should be less in today's context but random use of imported materials in the name of sustainability and rapid construction, is stupid.

Commented [PM131]: Embodied energy

Commented [PM132]: Material use

Commented [PM133]: Embodied energy

Commented [PM134]: Material use

Interview 2:

Ar. Prabal Thapa

Code	Descriptions
Friendly climate	▪ general idea about climatic idea about the Kathmandu
Social behavior	▪ Division of parental house is the main cause for destroying traditional city fabric
Scale and form	▪ Width of the building decreased, height and number of storey increases >> destroying scale and proportion. ▪ What's so important in bigger aspect is the form itself that defines the type of material to be use
Traditional material	▪ Traditional brick has one problem >> not carbon efficiency
Material use	▪ What's so important in bigger aspect is the form itself that defines the type of material to be use

Commented [PM135]: Friendly climate

Commented [PM136]: Social behavior

Commented [PM137]: Scale and form

Commented [PM138]: Scale and form

Commented [PM139]: Material use

Commented [PM140]: Traditional material

Commented [PM141]: Scale and form

Commented [PM142]: Material use

Code	Descriptions
Site surrounding	▪ Scale of the building with respect to surrounding.
Building regulations	▪ Bylaws should have purpose of maintaining cityscape.
Modern Interpretation	▪ Traditional ideas to incorporate in modern planning
Historical knowledge	▪ Vernacular architecture, in response to climate, socio cultural demands and material available locally.

Commented [PM143]: Site surrounding

Commented [PM144]: Building regulations

Commented [PM145]: Modern interpretation

Commented [PM146]: Traditional architecture

Interview 3:

Ar. Deepak Panta

Code	Descriptions
Energy	▪ large circular glass windows which might be responsible for large amount of heat loss during cold winter night, making indoor space significantly cold.
Climate responsive	▪ even though overhangs are not provided, windows has been recessed in order to protect from rain.
Zeitgeist	▪ Pruscha reintroduced exposed brick façade at the time of 1950s and 1960s, when the façade of Nepalese architecture was often whitewashed, influenced by Rana architecture.
Scale and form	▪ Proportion and scale are the two aspects of traditional architecture, that should learn to maintain well in modern buildings also.

Commented [PM147]: Energy

Commented [PM148]: Modern interpretation

Commented [PM149]: Climate responsive

Commented [PM150]: Zeitgeist

Commented [PM151]: Scale and form

Commented [PM152]: Historic knowledge

Code	Descriptions
Genius Loci	▪ Panta also criticizes that intervention was done in wrong place, should not be done in Durbar Square.
Traditional material	▪ available timber was not of long enough length
Technology	▪ Vault as structural system itself in Taragaon ▪ With these new material, different forms like circle, square, hexagon could come in combination although such forms individually had already been in existance in traditional architecture. ▪ with reintroduction of brick, he brought up new skill of English bond (Header- stretcher bond)
Façade treatment	▪ surkhi pointed normal brick façade with clean lines and plane looks more authentic.
Modern Interpretation	▪ surkhi pointed normal brick façade with clean lines and plane looks more authentic. ▪ Taragaon complex is totally new form of architecture but looking at scale, composition and the way building has responded the central courtyard, it can be taken as new interpretation of traditional architecture. ▪ Pruscha was the first early architect who interpreted traditional Kathmandu valley architecture into new modern way. ▪ admires Gotz Haagmueller's work such as interpretation of traditional
Context	▪ Shape of the site guides built form ▪ building should be able to tell story satisfying given condition of context, program and client.

Commented [PM153]: Genius loci

Commented [PM154]: Technology

Commented [PM155]: Technology

Commented [PM156]: Modern interpretation

Commented [PM157]: Façade treatment

Commented [PM158]: Modern interpretation

Commented [PM159]: Façade treatment

Commented [PM160]: Modern interpretation

Commented [PM161]: Modern interpretation

Commented [PM162]: Modern interpretation

Commented [PM163]: Site context

Commented [PM164]: Context

Code	Descriptions
Historical knowledge	▪ Proportion and scale are the two aspects of traditional architecture, that should learn to maintain well in modern buildings also. ▪ Pruscha had matured understanding of valley architecture.

Commented [PM165]: Scale and form
Commented [PM166]: Historic knowledge
Commented [PM167]: Traditional architecture

Interview 4:

Ar. Arun Dev Panta

Code	Descriptions
Orientation	▪ Building orientation for cutting off excessive glare but heat gain is ok for winter
Rain	▪ building got no overhang, so water spashes all over. Similar problem in Taragaon also, no overhangs.
Solar	▪ Building orientation for cutting off excessive glare but heat gain is ok for winter
Climate responsive	▪ Traditional technology – much more ecofriendly system. ▪ passive technique of natural ventilation is effective.
Region	▪ the traditional valley architecture developed here is purely indigenous
Culture	▪ Gorden Colen's "Serial vision concept". As we walk down the street, we see partial glimpses as we turn on corners. Durbar square of Kathmandu are also in same concept. ▪ It's stupid going for American style 30-year life span building with modern light weight prefab materials,

Commented [PM168]: Rain
Commented [PM169]: Historic knowledge
Commented [PM170]: Climate responsive
Commented [PM171]: Climate responsive
Commented [PM172]: Culture
Commented [PM173]: Culture
Commented [PM174]: Traditional architecture

Code	Descriptions
Social behavior	▪ Different layer of architecture seen in traditional Kathmandu itself. Earlier, what rulers used to do, people also copy.
Zeitgeist	▪ Starting point by foreign architects in modern Nepal is really appreciable. Other examples: Narayan hiti, Lab school, Sano Thimi campus.
Societal responsibility	▪ For modern urban context, constructing large building is not a big deal, leaving large open space, plazas is great thing >> taking clue of durbar square as a public space.
Scale and form	▪ Carl Pruscha, Kenzo Tange used vault but it's difficult to maintain and it became alien form for Nepal. Except, its good example of experimenting contemporary form. ▪ Human scaled projects are automatically successful ▪ Taragaon is more acceptable because it is broken into smaller fragmented pieces, feels more in context and appropriable ▪ Segregated volume, use of brick and contemporary modern material. ▪ Contemporary big building but has broken up the big rigidity
Present social need	▪ Addressing the changing demand, think for what we are designing. ▪ Example of Labim mall, earlier horrible Lalitpur bishal bazzar building developed into happening space. ▪ Sanchyakosh building of Thamel. Even though the building might has primary motive of economy generation, Bibhuti Man Singh has created plazas, level that blend with Thamel.

Commented [PM175]: Social behavior

Commented [PM176]: Zeitgeist

Commented [PM177]: Societal responsibility

Commented [PM178]: Scale and form

Commented [PM179]: Scale and form

Commented [PM180]: Material use

Commented [PM181]: Present social need

Commented [PM182]: Present social need

Commented [PM183]: Present social need

Commented [PM184]: Modern interpretation

Code	Descriptions
Brick	▪ Brick is used at suitable places, for contextualization with proper protection and overhang.
Material use	▪ use of brick and contemporary modern material.
Façade treatment	▪ Neo classical embellishment in people's house. Panta claims that fusion of Newari and western classical architecture brightened the Newari house. ▪ Beautification of the façade with dacchi appa in the name of Newari architecture >> even worse than pop art.
Strength	▪ "I want to make building that last generations."
Site surrounding	▪ Temple tree >> tried to create urban oasis
Relation with Nature	▪ there is strong relation between Nepalese settlement pattern and topography. ▪ For his Shangri-La Village Resort project in Pokhara, he studied a small compact hill settlement, Birethanti where houses are attached to each other and also following the hill topography. ▪ Master plan of Barahi Jungle Lodge, shaped by site boundary, river, terrain.
Process	▪ We cannot develop courtyard spaces in modern days until housing company or government planning initiatives take it up. Community space development is a different thing.
Modern Interpretation	▪ Because the site for the project was limited, he gathered knowledge from similar compact settlement in hill ▪ Brick is used at suitable places, for contextualization with proper protection and overhang.

Commented [PM185]: Brick
Commented [PM186]: Modern interpretation
Commented [PM187]: Scale and form
Commented [PM188]: Material use
Commented [PM189]: Façade treatment
Commented [PM190]: Façade treatment
Commented [PM191]: Strength
Commented [PM192]: Relation with nature
Commented [PM193]: Relation with nature
Commented [PM194]: Relation with nature
Commented [PM195]: Planning
Commented [PM196]: Modern interpretation
Commented [PM197]: Brick
Commented [PM198]: Modern interpretation

Code	Descriptions
	▪ if we can serialize our vision in context and each component of vision should be equally good, it defines different form and mass. ▪ About Carl Pruscha's work >> Truly modern attempt in Nepal ▪ Sign of development of contemporary building that could be taken as example representing Kathmandu context?? Rarely but some to extend improvements can be seen. ▪ Labim mall is a contemporary example, how challenges created by already existing building guided new addition. ▪ Bibhuti Man Singh has created plazas, level that blend with Thamel.
Context	▪ Site and context define the organic pattern of the Nepalese settlement. ▪ Contextualizing the site is important. ▪ Going horizontal as much as possible for Kathmandu's context. He opposes the idea of tall tower structure in the name of preserving green area. ▪ Modern development in any city should be carried out understanding its context. Eg: Sports city favourable for Pokhara. ▪ site itself guided succession of the project. ▪ Although neo classical building era has got history in Kathmandu, Panta points out those building to be out of context, socio culturally and climatically also.
Historical knowledge	▪ No strong regular rigid geometrical form and pattern found in Nepalese historical settlements. ▪ Gorden Colen's "Serial vision concept". As we walk down the street, we see partial glimpses as we turn on

Commented [PM199]: Modern interpretation

Commented [PM200]: Modern interpretation

Commented [PM201]: Modern interpretation

Commented [PM202]: Modern interpretation

Commented [PM203]: Present social need

Commented [PM204]: Modern interpretation

Commented [PM205]: Context

Commented [PM206]: Context

Commented [PM207]: Context

Commented [PM208]: Context

Commented [PM209]: context

Commented [PM210]: Traditional architecture

Code	Descriptions
	corners. Durbar square of Kathmandu are also in same concept. ▪ Early Kathmandu's existing challenges has developed such great spaces and urban form in the valley. ▪ Traditional technology – much more ecofriendly system. ▪ the traditional valley architecture developed here is purely indigenous.

Commented [PM211]: Culture
Commented [PM212]: Traditional architecture
Commented [PM213]: Traditional architecture
Commented [PM214]: Historic knowledge
Commented [PM215]: Climate responsive

Interview 5:

Ar. Bibhuti Man Singh

Code	Descriptions
Friendly climate	▪ Singh doesn't think climate as a strong determinant of form in Kathmandu. Climate of Kathmandu has been so kind to us.
Region	▪ Singh also finds traditional Newari architecture as basepoint for Nepalese identity.
Culture	▪ Cultural reference
Societal responsibility	▪ With globalization modern architecture has ignored context, but it's not good. It goes against the very purpose of architecture. ▪ Civic aim
Present social need	▪ No architect can be entirely modern or traditional; his works always respond to specific contexts ▪ incorporating new function.
Material use	▪ His choice for brick is a revival of traditional valley architecture but at the same time he thinks, concrete

Commented [PM216]: Friendly climate
Commented [PM217]: Region
Commented [PM218]: Historic knowledge
Commented [PM219]: Culture
Commented [PM220]: Societal responsibility
Commented [PM221]: Societal responsibility
Commented [PM222]: Modern interpretation
Commented [PM223]: Present social need

Code	Descriptions
	would have been stronger and more water proof on vault of Taragaon structures.
Technology	▪ Instead, these vaults are made of two layers of brick on edge, with layer of locally available bitumen in between.
Façade treatment	▪ we are fond of external beauty of building only ▪ minimal ornamentation, surkhi pointed brick façade with white horizontal bands
Strength	▪ concrete would have been stronger and more water proof on vault of Taragaon structures.
Site surrounding	▪ Physical context should be given top priority ▪ Club Himalaya's site on top of hill with 270-degree exposure to mountain as a strong stimulus to the project.
Ecology	▪ Ecological responsiveness.
Process	▪ Singh believes that traditional architecture springs out of un-self-conscious decision. It's a long process of improvisation over generations.
Building regulations	▪ language of modern architecture that respond to Nepali context has not been developed in Nepal,
Modern Interpretation	▪ we could extract whatever we can at a minimal cost and put that into modern structures to still retain the traditional air and art. ▪ the unornamented brick structure Taragaon represents modern style of building in Kathmandu. ▪ if Pruscha self consciously had understood the valley architecture and reinterpreted in modern way, then Singh thinks credit should be given to him.

Commented [PM224]: Material
Commented [PM225]: Strength
Commented [PM226]: Technology
Commented [PM227]: Façade treatement
Commented [PM228]: Façade treatment
Commented [PM229]: Material
Commented [PM230]: Strength
Commented [PM231]: Site surrounding
Commented [PM232]: Site surrounding
Commented [PM233]: Ecology
Commented [PM234]: Process
Commented [PM235]: Building regulations
Commented [PM236]: Modern inerpretation
Commented [PM237]: Modern interpretation

Code	Descriptions
	▪ Singh played with levels and plazas. He reinterpreted slope roof of traditional Newari architecture incorporating new function. ▪ he proposed minimal ornamentation, surkhi pointed brick façade with white horizontal bands and loft with slope roof.
Context	▪ It should spring from site regarding its local fabrics. Singh strongly disagrees with architects who goes totally out of context, in order to satisfy personal narrative story. ▪ Physical context should be given top priority and then other context such as socio-cultural, material, philosophical, etc. follows. ▪ Singh himself is not proud of the project Dwarika. Singh says, it doesn't include any site context and agrees to have provided setting for client's collection of old traditional doors, windows and columns only. ▪ In this modern age, Singh agrees going with modern trend but the roots to our cultural reference should not be forget.
Historical knowledge	▪ Singh also finds traditional Newari architecture as basepoint for Nepalese identity.

Commented [PM238]: Modern interpretation

Commented [PM239]: Present social need

Commented [PM240]: Façade treatment

Commented [PM241]: Modern interpretation

Commented [PM242]: Context

Commented [PM243]: Site surrounding

Commented [PM244]: Overall context

Commented [PM245]: Context

Commented [PM246]: Context

Commented [PM247]: Region

Commented [PM248]: Historic knowledge

Appendix 2: Coding from Literature

Regional Attributes	Descriptions	Paper Title
Climate	• Including new ideas about environment and phenomenology became a trendy. • Sustainable, environmentally-conscious architecture. • According to Kenneth Frampton, the importance of tradition in the built environment is ingrained not only in its architectural history and culture but also in the recognition of the unique qualities of site and climate. • Geographical and climatic condition>> major factor for influence in development of architectural style. • Solar control considerations (such as Best fit orientation) are lacking in traditional architecture.	• Critical Regionalism Reloaded • New Trends in Critical Regionalism through the Lens of Tzonis and Lefaivre • A comparative analysis of Kenneth Frampton's critical regionalism and William J. R. Curtis's authentic regionalism as a means for evaluating two houses by Mexican architect Luis Barragan • Regionalism and Nepalese Architecture • An approach to the design of housing for

Regional Attributes	Descriptions	Paper Title
		Kathmandu, Nepal
Spatial attribute	• The importance of place to the human experience • One must have a thorough understanding of the richness and complexity of place as it is experienced and shaped by real people in real places in order to study place attachment, sense of place, or place identity. • In the present day, a less genuine mindset that he labeled placelessness is rapidly displacing a true feeling of place. • Phenomenon of universalization resulted subtle destruction of traditional culture. • What aspects of cultural (or regional, or national) identity make up each? How are these to be used and represented? • Idea of genius loci, Idea of zeitgeist • Including new ideas about environment and phenomenology became a trendy.	• Place and Placelessness, Edward Relph • Towards a Critical Regionalism: Six points for an Architecture of Resistance • Critique of Critical Regionalism • Critical Regionalism Reloaded • Critical Regionalism Reloaded • Christian Norberg-Schulz and the Existential Space & On Phenomenological Discourse in Architecture • A comparative analysis of Kenneth Frampton's

Regional Attributes	Descriptions	Paper Title
	• Christian Norberg-Schulz >> Space is existential with the perception and schemata >> should express and reflect the person living and experiencing in it • William J. R. Curtis urges that tradition be viewed as a product of social structure and cultural evolution that must be felt in the physical environment. • Though socio-cultural tradition and behavior are portrayed considerably differently, architectural conceptions derived from the perspective of the climate are nearly comparable.	critical regionalism and William J. R. Curtis's authentic regionalism as a means for evaluating two houses by Mexican architect Luis Barragan • Regionalism and Nepalese Architecture
Material	• Modern culture and buildings universally conditioned and exhaustively optimized by technology. • Technological theory cannot resolve the core issues in architecture on its own. • Technology should always be implemented in a way that satisfies our local or regional needs.	• Towards a Critical Regionalism: Six points for an Architecture of Resistance • Christian Norberg-Schulz and the Existential Space & On Phenomenological

Regional Attributes	Descriptions	Paper Title
	• Interior thermal regulation in traditional architecture is essentially nonexistent, save from the insulation provided by adobe, brick walls, mud, and tiled roofs.	Discourse in Architecture • Regionalism and Nepalese Architecture • An approach to the design of housing for Kathmandu, Nepal
Topography	• Relation between architecture and its terrain should be organic.	• Critical Regionalism Reloaded
Planning	• Modern urban development has become "placeness," losing its sense of place. • We should deal with what we have now. The context of now, the environment of now. • It is a method or process rather than a product.	• Ten Points on Architecture of Regionalism: A Provisional Polemic • Literature review of Kenneth Frampton • Critique of Critical Regionalism
Building regulations	• Transformations in residential built form of Kathmandu	• Expression of cultural identity in the contemporary urban built form of Kathmandu

Regional Attributes	Descriptions	Paper Title
Modern Interpretation	• How to resuscitate a long-dead civilization and join the global civilization; how to become modern and go back to the roots. • Architecture needs to be mindful of the vernacular forms and critical of them at all times. • Although society can easily turn traditionalist or modernist, the neutral becomes (Lambrecht)tense. • While some vernacular forms are taken into consideration, their translation into contemporary architectural vocabulary falls short.	• Towards a Critical Regionalism: Six points for an Architecture of Resistance • Ten Points on Architecture of Regionalism: A Provisional Polemic • Literature review of Kenneth Frampton
Context	• The reality of the region such as locality, climate etc. is important. It also contains variable source such as myth (Culture), which don't have rigid boundaries. • "A helpful environment exists when the environment and lifestyles are compatible."	• Ten Points on Architecture of Regionalism: A Provisional Polemic • An approach to the design of housing for Kathmandu, Nepal

Regional Attributes	Descriptions	Paper Title
Historical knowledge	• How to resuscitate a long-dead civilization and join the global civilization; how to become modern and go back to the roots. • Past actions have an impact on present actions, and vice versa. • Revival of Figural quality >> aims to restore the muddled meaning of traditional architectural typology >> create meaningful architectural and experiential space	• Towards a Critical Regionalism: Six points for an Architecture of Resistance • Ten Points on Architecture of Regionalism: A Provisional Polemic • Christian Norberg-Schulz and the Existential Space & On Phenomenological Discourse in Architecture

Appendix 3: Coding memorandum

Dhakhwa House – Climatic aspect			
Literature	**Observation**	**Simulation**	**Interview**
• The climate in Kathmandu is mild and temperate. • Traditional valley architecture makes good use of solar radiation in	• The building is a traditional Newari house with private courtyard, structurally retrofitted with	• Thermal mass of 24" brick wall provides insulation against heat loss and gain. Also,	• Singh (2022) believes that the climate of Kathmandu has been so kind and doesn't think climate as a strong

Dhakhwa House – Climatic aspect			
conjunction with the thermal mass of the building to maintain a suitable interior temperature. • Solar control considerations (such as Best fit orientation) are lacking in traditional architecture(Adhikari, 1987)	minimal interventions. • Brick makes up the thermal bulk of this traditional building. • Indeed, the existing orientation of the building is guided by alignment of plot itself inside traditional core settlement.	the courtyard act as a buffer zone between internal and external environment, keeping temperatures more constant. • Even though if the building is oriented to best fit orientation, there is no significant changes in the result.	determinant of form in Kathmandu. • The traditional valley architecture developed here is purely indigenous. • Traditional technology – much more ecofriendly system.

Taragaon – Climatic Aspect			
Literature	**Observation**	**Simulation**	**Interview**
• "Courtyard employs as ingenious natural cooling strategies in hot climates (Raydan et al's Courtyards: A Bioclimatic Form,	• Brick makes up the thermal bulk of Taragaon's building walls and even the barrel vault roofs >> formation of a	• Even though there is slight deviation in orientation in between site condition and best fit orientation, there	• Thapa (2022) also accepts that the general idea about climate of Kathmandu seems sufficient for Carl Pruscha to design early

Taragaon – Climatic Aspect			
2006)" (Passe, 2012, p.5) • Aalto made sure they could function as "geniuses warming strategies" in colder climates as well.	uniform mass of bricks that significantly cooled • Ideal transverse ventilation is made possible by the open design of the rooms at both ends. • North-South orientation of the vault construction aids in blocking out unwanted glare from the West through their circular openings.	is no significant change in discomfort degree hour.	modern building, also reinterpreting valley architecture. • Tiwari (2022) identifies climate, geography and socio-cultural aspects as strong factors for identifying Kathmandu as region. • Panta (2022) also has positive view on climatic response of Taragaon, saying that even though overhangs are not provided, windows has been recessed in order to protect from rain.

Spatial Attribute		
Literature	**Observation**	**Interview**
• Although climate is the main factor that	• Spatial requirement also depends on culture.	• Strong culture can stand alone to identify as

Spatial Attribute		
define region, socio-cultural aspect strengthens it more. • William J. R. Curtis maintains that traditional culture should be viewed as a development of social organization that must be felt in the built environment (OROZCO, 2011) • Although socio-cultural tradition and conduct reflect quite differently depending on the region, architectural conceptions generated from the perspective of the climate are nearly comparable. (R. S. Shah, 1985b).	Such as: Courtyard is used in multiple ways in Newari tradition. • Both Dhakhwa house and Taragaon address changing time. • Conversion of traditional Newari house to homestay address both changing economic as well as cultural importance of heritage building. Whereas, Taragaon functions as museum for preservation and promotion of Nepalese art. • Maharjan (2022) finds these barrel vaulted single storied structures of Taragaon best suit for exhibition and feels space & art spiritually connected.	the national culture. Tiwari and Singh (2022) strongly insist Newari architecture as base point for Nepalese identity. • With changing time, its architects' societal responsibility to addressing changing demand. • In today's urban context, Panta A. D. (2022) doesn't consider constructing large building as a big deal, but leaving large space for public is great thing >> not only emphasizes modern public space demand but also reinterprets publicness character of traditional space. • Thapa and Panta (2022) think scale and form as an important attribute for Pruscha, modern reinterpretation needs scale and proportion of traditional

Spatial Attribute		
		architecture to be well maintained. • Breaking down of the modern form into human scale, makes the project feels more acceptable in the context of Kathmandu. • Starting point by foreign architects in modern Nepal is really appreciable but Tiwari (2022) emphasizes on not overrating foreigneers' works over works of early Nepalese experts.

Material		
Literature	**Observation**	**Interview**
• While technology has conditioned and exhaustively optimized modern culture and architecture, it should always be used in a way	• With limited use of modern materials and taking maximum benefit of modern technology, we can break limitations of traditional architecture	• Material not only helps in defining the regional architecture, but mostly defines the form itself. • Tiwari (2022) opposes our thinking

Material		
that satisfies regional or local needs.(Shirazi, 2012) • The modern materials such as steel, glass, and concrete are popular nowadays and traditional materials of Kathmandu such as Newari tiles, brick etc. are declining in use. • Sengupta & Upadhyaya (2016 p.3) while describing modern Nepali home "Town houses … use of concrete and bricks, influence of globalization and westernization" as opposed to Newari homes as "Houses of brick and tile… work; bricks as the main structural material and richly carved woodwork".	also >> Brick vault and cable supported ceiling for larger interior in Taragaon. Fusion of traditional masonry and metal structure in Dhakhwa House.	about traditional materials can't be use in modern context. The use of brick as a structural vault in Taragaon shows Pruscha not only reintroduced brick, he also brought up new skill of English bond (Header-stretcher bond) because traditionally we only had stretcher bond. • "I want to make building that last generations." - (Panta A. D., 2022) • Proper material fusion is needed for aesthetic purpose also. • It's understandable that embodied energy should be less in today's context but random use of imported materials in the name of sustainability and rapid construction, is stupid.

Modern interpretation, context, historical knowledge		
Literature	**Observation**	**Interview**
• Society can easily become traditionalist or modernist, but the middle ground can become contentious. • While some vernacular forms are taken into consideration, their translation into contemporary architectural vocabulary falls short (Doroteo, 2016). Although some folk forms are taken into account, their translation into the vocabulary of modern architecture is inadequate.	• About Pruscha's work, with matured understanding of valley architecture, it's truly a modern attempt in Nepal. • Taragaon complex is totally new form of architecture but looking at scale, composition and the way building has responded the central courtyard, it can be taken as new interpretation of traditional architecture	• Singh (2022) agrees going with modern trend but the roots to our cultural reference should not be forgotten. • Primarily, contextualizing the site is important. Panta A. D. (2022) emphasizes on site and context as primary attribute that define the organic pattern of the Nepalese settlement >> traditional ideas need to be incorporated in modern planning. • Influenced by Gorden Colen's "Serial vision concept", As we walk down the street, we see partial glimpses as we turn on corners, Panta A. D. (2022) sees it as most promising feature of valley architecture also.

Appendix 4: Thesis originality report

Revised_012_Prakash_thesis final report.docx

ORIGINALITY REPORT

7%
SIMILARITY INDEX

PRIMARY SOURCES

1	spacesnepalblog.wordpress.com Internet	450 words — 1%
2	hdl.handle.net Internet	304 words — 1%
3	docenti.unimc.it Internet	288 words — 1%
4	mafiadoc.com Internet	240 words — < 1%
5	www.diva-portal.org Internet	204 words — < 1%
6	docplayer.net Internet	180 words — < 1%
7	researchportal.port.ac.uk Internet	131 words — < 1%
8	www.tandfonline.com Internet	124 words — < 1%
9	monoskop.org Internet	123 words — < 1%
10	ecs.com.np Internet	

Appendix 5: Journal Article submitted to IOEGC, 2022

त्रिभुवन विश्वविद्यालय
Tribhuvan University
इन्जिनियरिङ अध्ययन संस्थान
Institute of Engineering
डीनको कार्यालय
OFFICE OF THE DEAN

GPO box- 1915, Pulchowk, Lalitpur
Tel: 977-5-521531, Fax: 977-5-525830
dean@ioe.edu.np, www.ioe.edu.np
गोश्वारा पो ब न- १९१५, पुल्चोक, ललितपुर
फोन- ५५२१५३१, फ्याक्स- ५५२५८२०

Date: October 10, 2022

To Whom It May Concern

This is to confirm that the paper titled "*Architecture Regionalism, examination of orientation in Taragaon*" submitted by **Prakash Maharjan** with Conference ID **12114** has been accepted for presentation at the 12th IOE Graduate Conference being held in October 19 – 22, 2022 at Thapathali Campus, Kathmandu.

Khem Gyanwali, PhD
Convener,
12th IOE Graduate Conference

IOE Graduate Conference
[Placeholder for Publication Information]

Architecture Regionalism, examination of orientation in Taragaon

Prakash Maharjan[a], Sanjaya Uprety[b],

[a] *Department of Architecture and Urban Planning, M. Arch, Pulchowk Campus,IOE, TU, Nepal*
[b] *Department of Architecture and Urban Planning,Pulchowk Campus,IOE, TU, Nepal*
[a] maharjan49.prakash@gmail.com, [b] suprety@ioe.edu.np,

Abstract
The global applicability of modern architecture has become a serious threat to the local language of architecture. The concept of critical regionalism emerged as a reaction to modern architecture's failure to include the local context of the place and region. Among several regional architectural attributes climate responsive design has been emphasized by several authors like Frampton and other researchers. In Nepal, the emergence of modern architecture after the 1950s and the design projects led by foreign architects like Carl Purscha are said to have given due consideration to the local climatic condition as a key attribute in their designs without any evaluation of such claims. Considering the local climate as a key to the Kathmandu valley's regional architectural character, this study intended to examine the climate response to achieve thermal comfort and energy consumption in the design of the Taragaon Building designed by Carl Purscha The method used for the study included the climate analysis of 10 years data from DHM and simulation of design as it is now using the Autodesk Ecotect 2011 simulation software. The result showed that the building is oriented 15.5 degrees West of South, which it differs by 20.5 degree from best fit orientation suggested by the climatic data i.e. orienting buildings 5 degrees East of South. Even though there is slight deviation in orientation, the result shows no significant change in thermal comfort and energy consumption. It can be concluded that this building best fits the climate of Kathmandu. This study indicates that the buildings built between the 1950s and the 1990s by foreign international architects, which were believed to have regional characteristics, this analysis verifies such assumptions from a climatic perspective.

Keywords
Critical Regionalism, Climate, Building orientation, Carl Pruscha, Kathmandu valley

1. Introduction

As human needs change, architecture is adaptable and constantly adopts new science and technology. Due to the speed of technological advancement, science and technology cannot be restricted to one area and are used throughout the world. Similar to how the architectural style of one location or nation is accepted in another, it is also adjusted to fit the local environment, sociocultural background, and religious beliefs [1]. With the stages of evolution of architectural styles, we have achieved many remarkable buildings. But with the new styles, it lacked a response to culture, context, and its surroundings and didn't create a perfect human living environment that can express human emotions and passions [2]. With widespread modernism, the efforts which are made to highlight regional and local concerns were left behind [3]. Thus, the need arises for an essential need to study architecture related to society, architecture that considers community needs, context, climate, and surrounding environment [2].

An approach called critical regionalism uses contextual factors to infuse Modern Architecture with a feeling of place and purpose in an effort to combat placelessness and lack of meaning. Critical regionalism's architectural aesthetic aims to offer a structure that is established in modern tradition but connected to its geographic and cultural setting. It's not just regionalism in the traditional sense; rather, it's a forward-thinking design philosophy that aims to bridge the gap between the universal and regional architectural languages [4]. Architectural theorists Alexander Tzonis, Liane Lefaivre, and Kenneth Frampton created the term "critical regionalism" in the 1980s to designate works that combine contemporary architecture with local traditions.

Worldwide applicability of modernism almost totally discarded all the “Regional” building attributes. After leaving British Colonial authority, India adopted modernism as the favored style for new architectural development. However Indian architects began realizing the limitations of modernist architecture by the 1960s as it seemed inadequate to fulfill social and cultural aspirations. The need for critical regionalism was also realized by Indian architects. In order to combat the standardization of architecture brought on by modernism, Indian architects like as Raj Rewal, Charles Correa, and Balkrishna Doshi began implementing the principles of critical regionalism into their projects in the 1970s and 1980s [5].

In a similar vein, Nepal also became open to modern development with the restoration of democracy in 1950. Soon after, the valley became accessible for modern development, a number of projects providing technical support from different nations and international organizations arrived. Due to Nepal’s relatively limited expertise with developing modern building types, a wide range of international architects have worked and contributed to the architectural design of the nation.

As a consultant for the United Nations, Austrian architect Carl Pruscha traveled to Nepal in 1965 to assist with the creation of the Kathmandu Valley master plan and preparing a comprehensive inventory of the valley’s historical and cultural landmarks. He also worked as an architect, planning and constructing not only his personal home in Bansbari but also the Centre for Economic Development at Tribhuvan University (1970; with Jorgen Rahbeck Thomsen’s help) and the Taragaon complex (1971). His project, Taragaon complex at Bouddha can be taken as one of the earliest modern architectural designs in Kathmandu. Deeply understanding different aspects of the valley architecture, he reinterpreted it in his designs by an attempt to blend physical, cultural and spiritual landscape of the valley while maintaining its contemporary expression [6]. However, actual performance of his building complex (Taragaon) in terms of climate is not examined so far. So, this is the fresh area to examine. Thus, this paper aims to examine whether the building is fit to the climate of Kathmandu, as an important part of architecture regionalism.

2. Literature Review

2.1 Regionalism

Regionalism is a shared sense of identity shared by individuals from a certain geographic area who are connected by common language, culture, and ethnicity. It is the context and traditions of construction in a particular location as seen through the lens of architecture. These structures require a thorough understanding of the local climate, geology, geography, and topography. It is more of a response and almost a replication of the already existing local context and it is much more vernacular in nature. A crucial component of regionalism is the climate. E.g.: Fountains in the courtyard use evaporative cooling (cool water cooling the surrounding air) in hot climate. Geoffrey Bawa developed “Tropical Modernism”, suited for the tropical climate of Sri Lanka featuring use of courtyards, the shapes of the roofs, the use of building materials, and various details found inside the house. He suggested a more straightforward design for the roof, reducing the different roof shapes connected to diverse architectural styles to their most basic form: a triangular pitched roof. Such a tactic emphasizes the idea that the roof serves as a shelter and an umbrella, an image that may be related to the straightforward structures in rural Sri Lanka [7].

2.2 Critical Regionalism

The architectural theory of Critical Regionalism was first introduced by Alexander Tzonis and Liane Lefaivre in their 1981 article, ”The Grid and the Pathway,” and later developed by architectural critic and historian Kenneth Frampton in his 1983 essay, ”Towards a Critical Regionalism: Six Points for an Architecture of Resistance.” Its original goal was to provide an alternative to the ’International Style’ modern architectural crisis, which cried out to be distinguished from the 1980s postmodern architecture that was then being promoted as the primary answer to the issue. A ”infrastructure of resistance” that could reconcile global industrialization with regional communities’ cultural identities was what critical regionalism envisioned. Therefore, Frampton’s critical regionalism should be seen as an assimilation process rather than a style [8]. Kenneth Frampton’s ”architecture of resistance” emphasizes local site and environmental factors including light, terrain, context, and climate as a means of combating ”placelessness” and a lack of meaning in Modern Architecture. The following assessment criteria help identify regionalist architecture:

• Context-specific Architecture

• Historical Knowledge

• Climate Responsiveness

• Materiality

• Ecology and Landscape

• Social and Cultural Appropriateness

• Technology

The modernist idea of "a single house for all countries, all climates" made the modern buildings heavily dependent on mechanical devices for thermal comfort. The range of acceptable thermal conditions separating interior from external was constrained by the transition from open, naturally ventilated rooms to completely sealed ones. something that made modern society even more placelessness. So, one of the ideas of critical regionalism is to respect the climatic aspect of each region and develop architecture in accordance to it.

2.3 Climate

One of the key elements that affects architecture is the climate. Making a study of climate exclusively in relation to architecture is not very acceptable because architecture is a complex product where, in addition to climate, materials, construction methods, and religious, political, and social circumstances have all played a role [9]. The planning, structure, kind of roof, and exterior finishing of architecture are all influenced by the climate:

• Cold to hot climates exist. Cold, in the broadest sense, refers to confined and compact planning. Heat necessitates candor.

• Extremes of heat and cold favor huge, dense constructions. The usage of light constructions is permitted in temperate climates.

• The roof's shape is determined by the snow and rain.

• The treatment of openings and their placements are determined by the amount of daylight, breezes, clouds, and humidity.

2.4 Orientation

In the context of climate-responsive passive design, orientation is a crucial design strategy. Additionally, it is crucial for ensuring thermal comfort and lowering the amount of energy used for lighting, cooling, and other functions. According to study, a home's heating needs can be cut in half or more with the appropriate glazing, insulation, thermal mass, and orientation, which also cuts energy costs and greenhouse gas emissions [9]. Therefore, it is preferable to align the building's longitudinal axis with the East-West direction such that the southern façade absorbs the most heat during the winter and the northern façade absorbs the least during the summer.

3. Methodology

This study is based on qualitative and quantitative methods. For the qualitative method, theories related to regionalism were studied and attributes for defining regionalist architecture were obtained. Among different variables, only the orientation aspect of the climatic attribute was detailed out. Likewise, for the quantitative method, energy modeling, and simulation of selected case building was done. Among buildings in the Taragaon complex, energy modeling and simulation of one smaller unit (longer façade facing south) was carried out using Autodesk Ecotect Analysis 2011. The base simulation model was created as per current construction details, materials, and systems. Simulation was done, with the building oriented as per site condition and discomfort degree hour, heating/cooling load was calculated. Then, the building was oriented to best fit orientation. The results were analyzed and comparative analysis was done, in order to verify whether the findings from existing orientation aligns or contrasts with best fit orientation.

Before energy modeling and simulation were carried out, weather data from the Department of Hydrology and Meteorology (DHM) was analyzed, in order to find the basic local climatic condition of Kathmandu. The following findings were obtained from climate analysis of weather data.

a. The climate analysis showed that the Kathmandu Valley's year-round comfort range is between 20.5°C and 26.5°C.

b. The valley's best orientation advises placing structures facing south to catch the low-angle winter sun. i.e., a building with a long façade facing South and an East-West orientation. More precisely, orienting buildings 5 degrees East of South to receive the maximum solar radiation in winter; this is a suitable option for passive solar heating.

c. Wind analysis throughout the year shows, there is maximum wind flow of 10 to 20 km/hr from West.

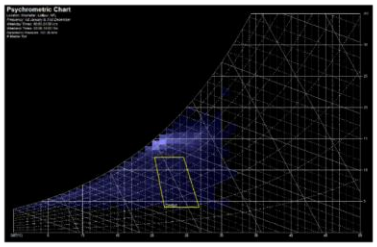


Figure 1: Comfort range for Kathmandu

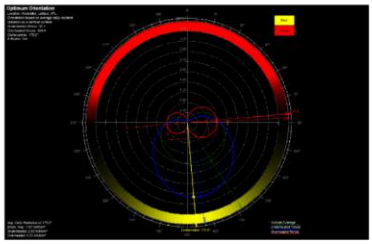


Figure 2: Best orientation for Kathmandu

4. Context of study

Taragaon complex, in Bouddha is the significant project of Carl Pruscha in Kathmandu. The traditional Dharmashalas, which are barrel vaulted buildings used as "Patis" to lodge pilgrims inside the temple complexes, had an influence on the shape and purpose of the basic unit of Taragaon. As a result, a small square was built in the middle of the 16 small units, that were arranged around a communal house. For this, a brick vault instead of the pitched roofs typical of the valley was selected. The complex was constructed with the intention of creating a Newar village in a nutshell, where Western visitors, including artists, writers, scientists, scholars, and individuals interested in religion, might stay for a few days. Today, it has been transformed into a museum for the preservation, restoration, and documenting of the arts and traditions of the Kathmandu Valley. The facility was eventually restored, rehabilitated, and reopened in March 2014 [10].

Figure 3: Taragaon complex 3D model

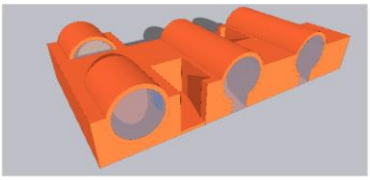


Figure 4: Taragaon, smaller unit at NE

5. Analysis and Results

From observation, it is found that the whole Taragaon complex is oriented 15.5 degrees West of South. So, there is 20.5 degrees of difference between site condition and best orientation suggested as per weather data. Hotel Hyatt Regency to the North of Taragaon complex is also oriented in same angle. It seems that the building responded to East boundary of the site, considering Bouddha stupa as view. However, only 2 out of 5 smaller units have their longer façade facing south to receive the maximum solar radiation.

Simulation of one smaller unit (longer façade facing south) is done in Autodesk Ecotect Analysis 2011. The building has dimension of 57' x 31' and 10.5' height, including vault. Taking comfort range between 20.5°C to 26.5°C and under the condition of natural ventilation. Wall and vault roof of 9" brick masonry. Circular opening of 6mm standard glass. Following observation were taken.

Figure 5: Taragaon complex

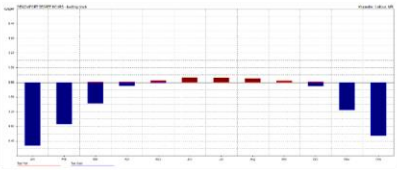


Figure 6: Discomfort degree hour

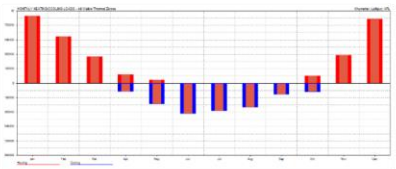


Figure 7: Monthly Heating/Cooling Loads

5.1 Normal condition

From the simulation, it is found that in existing condition with natural ventilation in all visible thermal zones, January and June are the most discomfort months with 6879 DegHrs and 536 DegHrs respectively

With mixed-mode system, results show maximum heating is needed in February with heating load of 6824W whereas maximum cooling is needed in May with cooling load of 4491W.

5.2 5.2 Optimization – 20.5º orientation change (best orientation – long side facing 5º East of South)

With 20.5º clockwise offset of North (best orientation), it is found that, with natural ventilation in all visible thermal zones, the discomfort degree hour in January is reduced to 6876 DegHrs (0.04 percent reduced) and the discomfort degree hour in June is reduced to 532 DegHrs (0.75 percent reduced).

With 20.5º clockwise offset of North (best orientation) and mixed-mode system, results show that heating load needed in February remains same i.e. 6824W whereas cooling load needed in May is reduced to 4461W (0.67 percent reduced)

5.3 Summary

	Normal condition	20.5 º Orientation change – Best orientation
Discomfort Degree	6879 DegHrs in January. 536 DegHrs in June.	0.04% reduced in January. 0.75% reduced in June.
Monthly Heating/Cooling Loads	Heating load of 6824W in February. Cooling load of 4491W in May.	Heating load remains same. Cooling load 0.67% reduced in May.

Figure 8: Results of simulation

6. Finding and Discussion

The climate in Kathmandu is mild and temperate. This place doesn't get too hot or too cold. Even though the temperature does not drop significantly during the winter, traditional valley architecture was developed in response to the chilly climate. Research findings shows that traditional valley architecture makes good use of solar radiation in conjunction with the thermal mass of the building to maintain a suitable interior temperature.

Field observation reveals that brick makes up the thermal bulk of Taragaon's building walls and even the barrel vault roofs. These vaults are constructed from two brick layers placed edge-to-edge with a

coating of bitumen that is readily available locally filling the space in between. The end outcome was the formation of a uniform mass of bricks that significantly cooled. Rain that penetrates the bitumen evaporates at that level, acting as a cooling agent. Ideal transverse ventilation is made possible by the open design of the rooms at both ends. Additionally, it appears that, North-South orientation of the vault construction aids in blocking out unwanted glare from the West through their circular openings.

Simulation result of the selected block shows that, even though there is slight deviation in orientation in between site condition and best fit orientation, there is no significant change in discomfort degree hour. So, the building so far fits according to the climatic attribute of architecture regionalism for Kathmandu. Singh [11] believes that the climate of Kathmandu has been so kind and doesn't think climate as a strong determinant of form in Kathmandu. Additionally, Thapa [12] also accepts that the general idea about climatic idea of the Kathmandu seems sufficient for Carl Pruscha to design early modern building, also reinterpreting valley architecture. Furthermore, Panta [13] also has positive view on climatic response of Taragaon, saying that even though overhangs are not provided, windows has been recessed in order to protect from rain. Also, provision of gutter at edge of vault is constructed in good way.

7. Conclusion

This study represents the simulation result of building orientation as an important aspect of climate. Climate being one of the important attributes of regionalism, from the result it can be concluded that this building best fits with the climate of Kathmandu. There is slight deviation from best fit orientation but the result matches with suggested orientation for Kathmandu i.e., orienting buildings towards the south to receive the low-angle winter sun. Indeed, the study confirms that the buildings built between 50s - 90s by international foreign architects which were claimed to have regional attributes, this paper confirms those assumptions from climatic perspective. However, orientation may be different for other buildings done by famous architects here, further research need to be carried out.

References

[1] R.S. Shah. *Regionalism and Nepalese Architecture*. 1985.

[2] J.M. Khader. *The Architecture of Respecting Context and Surrounding Environment*. 2016.

[3] R. Powell. *Exploring Architecture in Islamic Culture 2- Regionalism in Architecture*. 1985.

[4] A.K. Menon. works of architects and works of tadao ando, in critical regionalism. 2016.

[5] Sanyam Bahga and Gaurav Raheja. An account of critical regionalism in diverse building types in postcolonial indian architecture. *Frontiers of Architectural Research*, 7(4):473–496, 2018.

[6] D. Panta. Critical regionalism, for contextual architectural development in kathmandu. 2022.

[7] A.B. Setiawan. Modernity in architecture in relation to context. 2010.

[8] Juan Carlos Orozco. *A comparative analysis of Kenneth Frampton's critical regionalism and William JR Curtis's authentic regionalism as a means for evaluating two houses by Mexican Architect Luis Barragan*. PhD thesis, Kansas State University, 2011.

[9] JH Ghadlali. Effect of climate on architectural expression. In *Seminar on Architecture*, 1959.

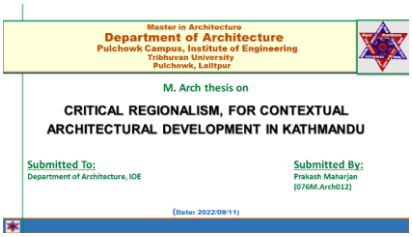
[10] N. Prabhakar. The taragaon museum: one of nepal's first modern building. n.d.

[11] B.M. Singh. Critical regionalism, for contextual architectural development in kathmandu. 2022.

[12] P. Thapa. Critical regionalism, for contextual architectural development in kathmandu. 2022.

[13] A.D. Panta. Critical regionalism, for contextual architectural development in kathmandu. 2022.

Appendix 6: Thesis presentation slides


Master in Architecture
Department of Architecture
Pulchowk Campus, Institute of Engineering
Tribhuvan University
Pulchowk, Lalitpur

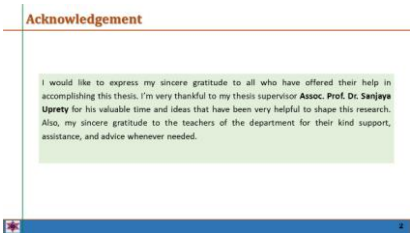
M. Arch thesis on

CRITICAL REGIONALISM, FOR CONTEXTUAL ARCHITECTURAL DEVELOPMENT IN KATHMANDU

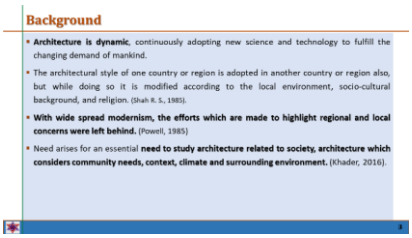
Submitted To:
Department of Architecture, IOE

Submitted By:
Prakash Maharjan
(076M.Arch012)

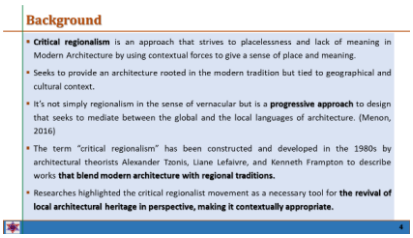
(Date: 2022/09/11)


Acknowledgement

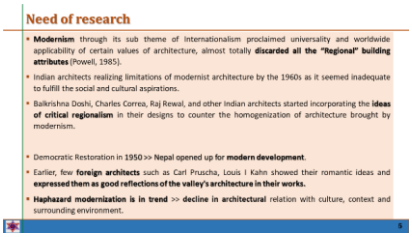
I would like to express my sincere gratitude to all who have offered their help in accomplishing this thesis. I'm very thankful to my thesis supervisor **Assoc. Prof. Dr. Sanjaya Uprety** for his valuable time and ideas that have been very helpful to shape this research. Also, my sincere gratitude to the teachers of the department for their kind support, assistance, and advice whenever needed.


Background

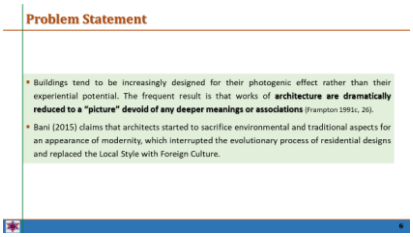
- **Architecture is dynamic**, continuously adopting new science and technology to fulfill the changing demand of mankind.
- The architectural style of one country or region is adopted in another country or region also, but while doing so it is modified according to the local environment, socio-cultural background, and religion. (Shah R. S., 1985).
- **With wide spread modernism, the efforts which are made to highlight regional and local concerns were left behind.** (Powell, 1985)
- Need arises for an essential **need to study architecture related to society, architecture which considers community needs, context, climate and surrounding environment.** (Khader, 2016).


Background

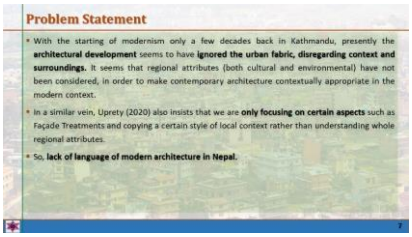
- **Critical regionalism** is an approach that strives to placelessness and lack of meaning in Modern Architecture by using contextual forces to give a sense of place and meaning.
- Seeks to provide an architecture rooted in the modern tradition but tied to geographical and cultural context.
- It's not simply regionalism in the sense of vernacular but is a **progressive approach** to design that seeks to mediate between the global and the local languages of architecture. (Menon, 2016)
- The term "critical regionalism" has been constructed and developed in the 1980s by architectural theorists Alexander Tzonis, Liane Lefaivre, and Kenneth Frampton to describe works **that blend modern architecture with regional traditions.**
- Researches highlighted the critical regionalist movement as a necessary tool for **the revival of local architectural heritage in perspective, making it contextually appropriate.**


Need of research

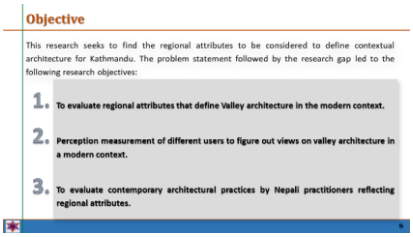
- **Modernism** through its sub theme of Internationalism proclaimed universality and worldwide applicability of certain values of architecture, almost totally **discarded all the "Regional" building attributes** (Powell, 1985).
- Indian architects realizing limitations of modernist architecture by the 1960s as it seemed inadequate to fulfill the social and cultural aspirations.
- Balkrishna Doshi, Charles Correa, Raj Rewal, and other Indian architects started incorporating the **ideas of critical regionalism** in their designs to counter the homogenization of architecture brought by modernism.
- Democratic Restoration in 1950 >> Nepal opened up for **modern development**.
- Earlier, few **foreign architects** such as Carl Pruscha, Louis I Kahn showed their romantic ideas and **expressed them as good reflections of the valley's architecture in their works.**
- **Haphazard modernization is in trend** >> **decline in architectural** relation with culture, context and surrounding environment.


Problem Statement

- Buildings tend to be increasingly designed for their photogenic effect rather than their experiential potential. The frequent result is that works of **architecture are dramatically reduced to a "picture" devoid of any deeper meanings or associations** (Frampton 1991c, 26).
- Bani (2015) claims that architects started to sacrifice environmental and traditional aspects for an appearance of modernity, which interrupted the evolutionary process of residential designs and replaced the Local Style with Foreign Culture.

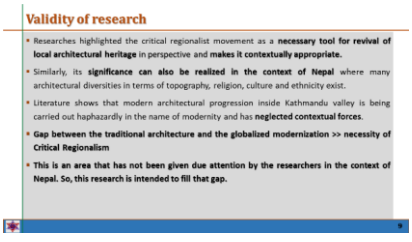

Problem Statement

- With the starting of modernism only a few decades back in Kathmandu, presently the **architectural development** seems to have **ignored the urban fabric, disregarding context and surroundings.** It seems that regional attributes (both cultural and environmental) have not been considered, in order to make contemporary architecture contextually appropriate in the modern context.
- In a similar vein, Uprety (2020) also insists that we are **only focusing on certain aspects** such as Façade Treatments and copying a certain style of local context rather than understanding whole regional attributes.
- So, **lack of language of modern architecture in Nepal.**


Objective

This research seeks to find the regional attributes to be considered to define contextual architecture for Kathmandu. The problem statement followed by the research gap led to the following research objectives:

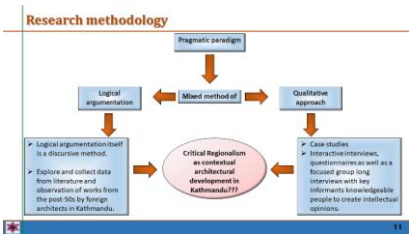
1. **To evaluate regional attributes that define Valley architecture in the modern context.**
2. **Perception measurement of different users to figure out views on valley architecture in a modern context.**
3. **To evaluate contemporary architectural practices by Nepali practitioners reflecting regional attributes.**

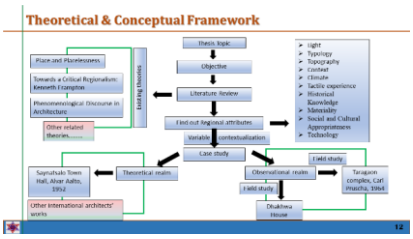

Validity of research

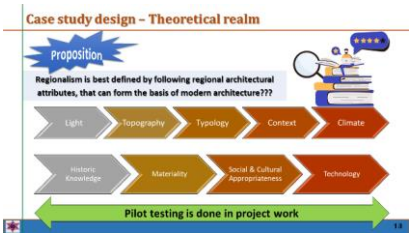
- Researches highlighted the critical regionalist movement as a **necessary tool for revival of local architectural heritage** in perspective and **makes it contextually appropriate.**
- Similarly, its **significance can also be realized in the context of Nepal** where many architectural diversities in terms of topography, religion, culture and ethnicity exist.
- Literature shows that modern architectural progression inside Kathmandu valley is being carried out haphazardly in the name of modernity and has **neglected contextual forces.**
- **Gap between the traditional architecture and the globalized modernization >> necessity of Critical Regionalism**
- **This is an area that has not been given due attention by the researchers in the context of Nepal. So, this research is intended to fill that gap.**

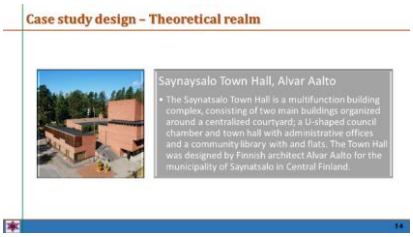

Research paradigm

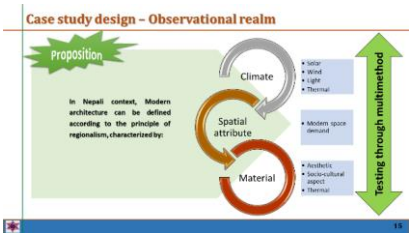
- Exploratory type and deals with socio-cultural aspects of human behavior, it requires logical argumentation as well as a qualitative approach.
- **Two paradigms: Constructivist and Critical Theory >> pragmatic paradigm**
- The ontological claim: **"In the name of modernization and development, Kathmandu is haphazardly embracing western trends that have adversely affected the local contextual architecture, art, craft, culture, and environment."**
- Epistemologically, needs a rigorous review of the literature, a field study of the past architectural works, and an argument-based qualitative approach to obtain a valid source of knowledge

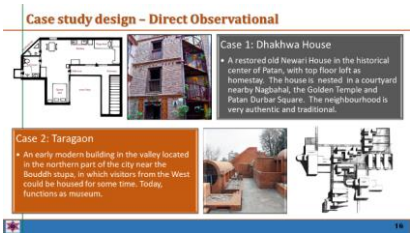

Research methodology
Pragmatic paradigm
Logical argumentation
Mixed method of
Qualitative approach
Logical argumentation itself is a discursive method.
Explore and collect data from literature and observation of works from the post-50s by foreign architects in Kathmandu.
Critical Regionalism as contextual architectural development in Kathmandu???
Case studies
Interactive interviews, questionnaires as well as a focused group long interviews with key informants knowledgeable people to create intellectual opinions.
11

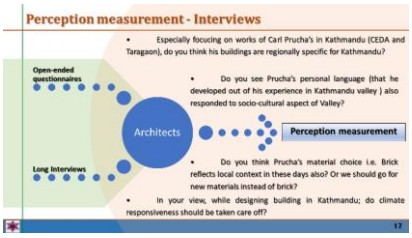

Theoretical & Conceptual Framework
Thesis topic
Objective
Literature Review
Find out Regional attributes
Variable
Contextualization
Case study
Existing theories
Place and Placelessness
Towards a Critical Regionalism: Kenneth Frampton
Phenomenological Discourse in Architecture
Other related theories.....
Light
Typology
Topography
Context
Climate
Tactile experience
Historical Knowledge
Materiality
Social and Cultural Appropriateness
Technology
Theoretical realm
Observational realm
Field study
Saynatsalo Town Hall, Alvar Aalto, 1952
Taragaon complex, Carl Prucha, 1964
Dhakhwa House
Other international architects' works
12

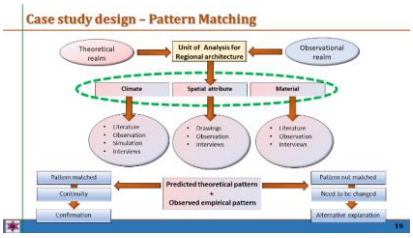

Case study design – Theoretical realm
Proposition
Regionalism is best defined by following regional architectural attributes, that can form the basis of modern architecture???
Light
Topography
Typology
Context
Climate
Historic Knowledge
Materiality
Social & Cultural Appropriateness
Technology
Pilot testing is done in project work
13


Case study design – Theoretical realm
Saynaysalo Town Hall, Alvar Aalto
The Saynatsalo Town Hall is a multifunction building complex, consisting of two main buildings organized around a centralized courtyard; a U-shaped council chamber and town hall with administrative offices and a community library with and flats. The Town Hall was designed by Finnish architect Alvar Aalto for the municipality of Saynatsalo in Central Finland.
14


Case study design – Observational realm
Proposition
In Nepali context, Modern architecture can be defined according to the principle of regionalism, characterized by:
Climate
Spatial attribute
Material
Solar
Wind
Light
Thermal
Modern space demand
Aesthetic
Socio-cultural aspect
Thermal
Testing through multimethod
15


Case study design – Direct Observational
Case 1: Dhakhwa House
A restored old Newari House in the historical center of Patan, with top floor loft as homestay. The house is nested in a courtyard nearby Naghahal, the Golden Temple and Patan Durbar Square. The neighbourhood is very authentic and traditional.
Case 2: Taragaon
An early modern building in the valley located in the northern part of the city near the Bouddh stupa, in which visitors from the West could be housed for some time. Today, functions as museum.
16

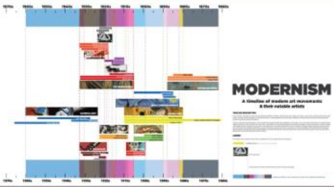

Perception measurement - Interviews
Especially focusing on works of Carl Prucha's in Kathmandu (CEDA and Taragaon), do you think his buildings are regionally specific for Kathmandu?
Open-ended questionnaires
Do you see Prucha's personal language (that he developed out of his experience in Kathmandu valley) also responded to socio-cultural aspect of Valley?
Architects
Perception measurement
Long Interviews
Do you think Prucha's material choice i.e. Brick reflects local context in these days also? Or we should go for new materials instead of brick?
In your view, while designing building in Kathmandu; do climate responsiveness should be taken care off?
17


Case study design – Pattern Matching
Theoretical realm
Unit of Analysis for Regional architecture
Observational realm
Climate
Spatial attribute
Material
Literature
Observation
Simulation
Interviews
Drawings
Observation
Interviews
Literature
Observation
Interviews
Pattern matched
Continuity
Confirmation
Predicted theoretical pattern
Observed empirical pattern
Pattern not matched
Need to be changed
Alternative explanation
18


Literature Review
19


Development of Modern Architecture
Throughout the history, different architectural styles developed.
Modern architecture evolved just after the evolution of new building materials in 19th century through industrial revolution.
20

Development of Modern Architecture



Source: https://mir-s3-cdn-cf.behance.net 21

Development of Modern Architecture

- Born with the spirit of modern age advancement and **to reform society** (Erviansyah 2020).
- Philosophically, modern architects **rebel against traditional styles** (Craven 2020).
- However, the early modernist style didn't completely left the history but **later started to get criticized** such as lacking personal identity, the essence of human-oriented design and contextuality because of homogeneity nature throughout the world
- **Combining modernism and local regional identity & cultures** for the spirit of contexts, the harmony with nature, the revival of historical context to create a sense of regionalism,

22

Vernacularism

- An Austrian American writer, Bernard Rudolfsky described Vernacular Architecture as "**Architecture without Architects**" in 1964.
- Oliver (As cited in Qtaishat, Adeyeye, Emmitt, 2018)defined it as the **dwellings and other buildings of the people, related to their environmental contexts and available resources,** they are customarily owner- or community-built, **utilizing traditional technologies.**
- Vernacular buildings are indeed human constructions resulted from relationships among humans, ecological, economic, material, culture and social factors, **that has evolved through trial-and-error methods** (Lawrence 2006).

Source: https://i.pinimg.com 23

Regionalism

- Regionalism is a common sense of **identity by people** belonging to a specific geographical region who are united by language, culture and ethnicity.
- In architecture, it is the context and customs of making buildings in a particular region.
- More of a response and almost a replication of the already existing local context and it **is much more vernacular in nature.**
- Characteristics of regionalism are closely related to local culture, climate, and technology of the time.

24

Critical Regionalism

- There is the paradox: how to become modern and to return to sources; how to revive an old, dormant civilization and take part in universal civilization.
- Introduced by Alexander Tzonis and Liane Lefaivre in article '**The Grid and the Pathway**' of 1981, the architectural theory of Critical Regionalism was later elaborated by architectural critic and historian Kenneth Frampton in his essay '**Towards a Critical Regionalism: Six Points for an Architecture of Resistance**', published in 1983.
- Originally aimed to offer an **alternative way out** of the crisis of '**International Style**' modern architecture that begged to differ from the **postmodern architecture** of the 1980s then being propagated as the main solution to the problem.
- Critical regionalism envisioned an '**architecture of resistance**' that could reunite universal modernization with the cultural identities of local communities.
- "Architecture of resistance" for Kenneth Frampton involves highlighting regional site and environmental conditions such as **light, topography, context and climate** as ways to combat "place lessness" and lack of meaning in Modern Architecture.

25

Critical Regionalism

- By using **contextual forces**, critical regionalism imparts a sense of place and meaning to architecture.
- The practitioners of critical regionalism seek to **integrate global architectural and technological developments with regional sensibilities** derived from **spatial, cultural and historical contexts.**
- Critical regionalism differs from regionalism in a way that it **does not resort to blind use of vernacular.**
- By being critical of a region's building traditions, a practitioner is able to **extract only the essence of these traditions** rather than literal references.

Kenneth Frampton
Source: www.architecturenorway.no

Findings

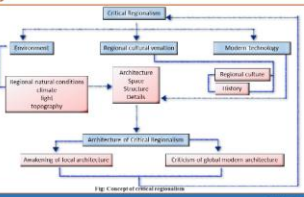


Fig: Concept of critical regionalism

Source: Jiang, 2015 27

Findings

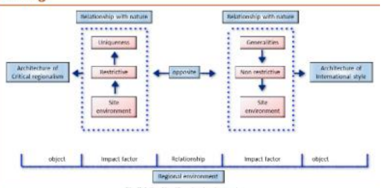


Fig: Relationship with regional environment

Source: Jiang, 2015 28

Findings

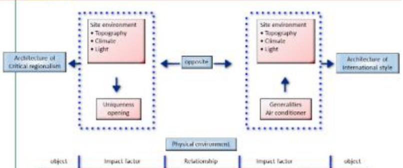


Fig: Relationship with Physical environment

Source: Jiang, 2015 29

Findings

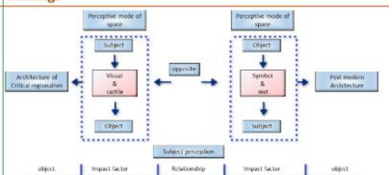


Fig: Relationship with Subject perception

Source: Jiang, 2015 30

Findings

Paper Title	Author's name	Published year	Main Findings
Towards a Critical Regionalism: Six points for an Architecture of Resistance	Kenneth Frampton	1983	• There is the paradox: **how to become modern and to return to sources**; how to revive an old, dormant civilization and take part in universal civilization. • Phenomenon of universalization resulted **subtle destruction of traditional culture.** • Modern culture and buildings universally conditioned and **exhaustively optimized by technology.** • Critical Regionalism, as, "mediating the impact of universal civilization with elements derived indirectly from the peculiarities of a particular place." • **"Architecture of resistance"** for Kenneth Frampton involves highlighting **regional site and environmental conditions** such as **light, topography, context and climate** as ways to combat "placelessness" and the universal.

31

Findings

Paper Title	Author's name	Published year	Main Findings
Ten Points on Architecture of Regionalism: A Provisional Polemic	Kenneth Frampton	1987	• Regionalism should **not be defined with the vernacular.** Because the architecture should take a place in the consciousness of the vernacular forms and always be critical about them. • All attempts influence the future and are influenced by past. "**Architecture is culture politics.**" • The reality of the region such as locality, climate etc. is important. It also contains variable source such as myth (Culture), which don't have rigid boundaries. **"A myth can become a critical and creative force."** • **Truly experiencing the environment** instead of reading buildings as picturesque images. • Modern urban development lost the sense of place, it become "placeness". Only focusing on the space break the relation through place attachment. • **Typology** - related to both civilization and culture whereas **Topography** - specific site that is in nature.

32

Findings

Paper Title	Author's name	Published year	Main Findings
			• **Architectonic** is a more artificial term. **Scenography** focuses on the scene like a representational nature in architecture. • Architecture should think of nature's outcomes such as light, climate, topography. **Artificial can be thought as a subtitle of nature.** • **Tactile experience evolves all senses whereas visual is limited.** Tactile experience prevented a "loss of nearness". • Critical Regionalism as a middle ground position between past and modern." It is a **concept of the environment where the body as a whole is seen as being essential** to the manner in which it is experienced"

33

Findings

Paper Title	Author's name	Published year	Main Findings
Place and Placelessness, Edward Relph	David Seamon & Jacob Sowers	1985	• **Place as it plays an integral role in human experience** • **Depth of place**>> Relph focuses on people's identity of and with place. • **Identity of place**>> "persistent sameness and unity which allows **that [place] to be differentiated from others**" >> 3 components 1. **the place's physical setting** 2. **its activities, situations and events** >> socialization with the physical world 3. **meanings created through people's experiences** • **Identity with place**>> the **degree of attachment, involvement, and concern** that a person or group has for a particular place. • Concept of **Insideness** and **Outsideness** >> different places take on different identities for different individuals and groups and human experience takes on different qualities of feeling, meaning, ambience and action. • **The feeling of perception held by people describes their sense of place** >> the way people experience, express, imagine and know that place.

34

Findings

Paper Title	Author's name	Published year	Main Findings
Literature review of Kenneth Frampton	Jan Doroteo	2016	• **Regionalism and critical regionalism are not one and the same.** • Regionalism, which is more of a response and almost a replication of the already existing local context and it is much more vernacular in nature whereas Critical regionalism is considered a type of a post-modern response to architecture. • **It's easy for society to develop as or traditionalist and modernist, but the neutral becomes a point of (con)tension.** • Critical Regionalism argues against imitating the past, and to be wary of fully adopting the future. • **We should deal with what we have now. The context of now, the environment of now.**

35

Findings

Paper Title	Author's name	Published year	Main Findings
Placing Resistance: A Critique of Critical Regionalism	Keith L. Eggener	2002	• Critical regionalism necessarily, discriminatingly, identified, abstracted, and melded local physical and cultural characteristics with more ubiquitous modern practices, technologies, and economic and material conditions. • It is a **method or process rather than a product.** • What are the constituents of cultural (or regional or national) identity? How are these to be represented and utilized? • **Critics** It seems, discussing the places where these designs appeared so often **emphasized one architect's interpretation of the region over all others:** Tadao Ando for Japan, Oscar Niemeyer for Brazil, Charles Correa for India, and Luis Barragan for Mexico.

36

Findings

Paper Title	Author's name	Published year	Main Findings
Critical Regionalism Reloaded	Gevork Hartoonian	2012	• Including new ideas about **environment and phenomenology** became a trendy. • **Qualifying modern architecture with regional characteristics - Under the influence of phenomenology,** the scope of that which makes architecture regional are **idea of genius loci, idea of zeitgeist and technology.** • Lewis Mumford says that, **for architecture forms to be valid, it must not merely be beautiful but timely.** • **Relation between architecture and its terrain should be organic.** Frank Lloyd wright's organic is praised for its contribution to the formation of his country's New Tradition.

37

Findings

Paper Title	Author's name	Published year	Main Findings
Christian Norberg-Schulz and the Existential Space & On Phenomenological Discourse in Architecture	Farah, Habib Mohammad, Khosro Sahhaf Sayyed & M. Reza Shirazi	2012	• Study of the **essence of human consciousness through the subjective experience of phenomena** >> from the first-person point of view and promotes the integration of human sensory and perception as part of built form to create an architectural and experiential space. • Phenomenology concerns the study of essences; **architecture has the potential to put essences back into existence** by weaving form, space, and light, architecture can elevate the experience of daily life through the various phenomena that emerge from specific sites, programs, and architectures. • **Technological theory alone cannot come to terms with the fundamental problems of architecture** >> its point of departure is once again the sphere of perception • Christian Norberg-Schulz >> **Space is existential with the perception and schemata** >> should express and reflect the person living and experiencing in it • Four levels >>**geography and landscape, urban level, the house and the thing**

38

Findings

Paper Title	Author's name	Published year	Main Findings
			• **Genius Loci – Spirit of place** >> emphasizes **connection between the man-made world and the natural world** >> also connected to certain **social or cultural characteristics**, which take the form of historically determined characteristics. • profoundly meaningful modern movement were again being rediscovered 2nd phase in the works of Aalto, the late works of Corbusier, and 3rd gen architects Utzon, Pietila, Stirling and Bofill • **Revival of Figural quality** >> attempts to restore the obscured meaning of types found in traditional architecture >> create meaningful architectural and experiential space • Two themes of **place and tactility** contribute, **a phenomenological flavor to Frampton's thinking about architecture.** Phenomenological geographer Edward Relph also emphasizes the need for **balancing globalizing, placeless forces with preserving a sense of local identity, home, and community**(Shirazi 2013).

Findings

Paper Title	Author's name	Published year	Main Findings
An account of critical regionalism in diverse building types in post-colonial Indian architecture	Sanyam Bahga, Gaurav Raheja	2018	• **Assessment criteria** to identify regionalist architectural projects in India ➢ **Context-specific Architecture** ➢ **Historical Knowledge** ➢ **Climate Responsiveness** ➢ **Materiality** ➢ **Ecology and Landscape** ➢ **Social and Cultural Appropriateness** ➢ **Technology**

40

Findings

Paper Title	Author's name	Published year	Main Findings
New Trends in Critical Regionalism through the Lens of Tzonis and Lefaivre	Elahe Zoghi Hoseini, Darab Diba, Hamed Kameinia, Mostafa Mokhtabad	2019	• Looks more like **sustainable, environmentally-conscious architecture**. • Deeply involved in environmental and ecological issues. • Reasonable solution to ever-growing urban world and universalization. • **Sustainable living and evolutionary adaptation** can greatly influence the identity and subsequently cultural and environmental landscape. • Results in **economic development**, also with tourism in a positive way.

41

Findings

Paper Title	Author's name	Published year	Main Findings
A comparative analysis of Kenneth Frampton's critical regionalism and William J. R. Curtis's authentic regionalism as a means for evaluating two houses by Mexican architect Luis Barragan	Juan Carlos Orozco	2011	• Frampton's critical regionalism, **not as a style, but as a process of assimilation.** With example of Jorn Utzon's Bagsvaerd Church and work of Tadao Ando, writer says that not every aspects of Framptom's theory needs to be taken into account. • William J. R. Curtis's insists to look **tradition as an evolution of culture and social structure which must be experienced in the built environment.** • Kenneth Frampton argues that the value of **tradition in the built environment is not only impregnated in its architectural history and culture**, but also in the acknowledgement of the specific characteristics of site and climate, to which critical regionalism seeks to generate an adequate response.

42

Findings

Paper Title	Author's name	Published year	Main Findings
			• Combining indigenous and imported qualities, the result was the same concrete and glass boxes with a few traditional elements pasted on the surface - **Fake-regionalism.** If we are to fuse modernity with tradition, the meanings must come from the genuine core values of society. • **Taking certain vernacular forms into account, does not adequately translate them into modern architectural language**

43

Findings

Paper Title	Author's name	Published year	Main Findings
Regionalism and Nepalese Architecture	Ranjan Singh Shah	1985	• Technology should always be adopted in such a way that it should satisfy our regional or local needs. • **Architectural concepts derived from the point of view of the climate are almost identical but socio-cultural tradition and behavior are reflected quite differently.** • Sherpa villages in **Khumbu>>Harsh climate and environment>>Definite link existing between the scattered groups of houses>>**given rise to **social integration** • **Kathmandu valley>>very rich in culture, art and architecture>>Religious and Cultural Harmony between Hinduism and Buddhism>>creation of relatively unique and advanced stage of urban culture.**

44

Findings

Paper Title	Author's name	Published year	Main Findings
An approach to the design of housing for Kathmandu, Nepal	Ambika P. Adhikari	1987	• **"When environment and lifestyles are congruent, there is a supportive environment."** (Rappoport, 1979) holds true in the predominantly traditional areas of Kathmandu • **Problems with indigenous systems** **Spatially:** ➢ While the horizontal expansion possibility in traditional housing is excellent, **there is no vertical flexibility.** **Technically:** ➢ Except for insulation offered by the adobe, brick walls, mud, and tiled roof, **interior thermal control is practically non-existent.** ➢ **Solar control considerations (such as Best fit orientation) are lacking.** ➢ Most importantly, in the area of **sanitation, damp proofing, water supply, and sewerage, the traditional housing is very weak.**

Findings

While a scientific approach to physical design is very much desirable, sensitivity towards the cultural context and indigenous architecture is extremely important on the part of the designer.

An approach to design based on the synthesis of traditional and modern systems is thus the most suitable one for Nepal and other Third World countries where traditional values and indigenous architecture are both strong.

46

Findings

	Indigenous		Industrial
Design	Historical type, sometimes repetitive	→ Time	International, Universally western type
Construction and materials	Mud, thatch, adobe, etc Unchanging details	→ Time	RCC, Precast element, high techniology

Table: Comparative building technology in two system
Source: Adhikari, 1987

Need for today in Kathmandu

47

Findings

	Site planning and design				Construction	Material	Aesthetic
	Size	Pattern	Configuration	Standards			
Indigenous system	Intimate, small	Extended from traditional pattern	Pertaining to traditional	Extended from the existing	Overall construction technology is excellent	Indigenous materials as much as possible	Derive aesthetics from the traditional forms with modification needed by materials, techniques, etc
	Retain spatial configuration connoting psychological familiarity to the residents						
Industrial system	Make necessary improvements based on solar factors and other scientific approach				Incorporate refinements and innovation in inherent defects	Have efficient materials in the core of the houses	

Table: Silent features of two systems adopted in designing dwellings for Kathmandu
Source: Adhikari, 1987

48

Findings

Paper Title	Author's name	Published year	Main Findings
Expression of cultural identity in the contemporary urban built form of Kathmandu	Brinda Shrestha	2018	• **Transformations in residential built form of Kathmandu** **1. In urban core** ➢ Interventions made with **added floors** in brick concrete works ➢ **Replacement of sloped roofs** with flat terraces ➢ **Vertical division of houses** due to property division ➢ Floor storeys mostly changed from three storeys to five or more ➢ **Floor height changed from the traditional height** of 7 feet to a height of 9 feet. ➢ **Adoption of reinforced concrete** as a technique for structural construction. ➢ **The functional dynamics of houses have changed** to multiple rental households instead of individual family households. • Built forms are driven by the utilitarian need of **economic transitions**

49

Findings

Paper Title	Author's name	Published year	Main Findings
Expression of cultural identity in the contemporary urban built form of Kathmandu	Brinda Shrestha	2018	**2. In the outer area** ➢ Unplanned sites and infrastructure development ➢ **Planned residential developments clearly lacked the features of a 'residential neighborhood'** in terms of the poor sense of place, a low opportunity for socialization, poor community coherence, and ineffective physical planning, as they fail to address local aspirations.

50

Modern architectural development in Kathmandu

- The glorious part of Nepalese traditional architecture that happened during the Malla Dynasties stretched for more than 600 years and ended up with the invasion of Shah in the later part of 1700 AD.
- Early modern architecture sparked eventually from post-Malla architecture, with influences from neighboring regions. (Bhattarai 2012).

Category -1	Category -2	Category -3	Category -4
Early 19th century defined by the introduction of Islamic elements during the Shah period. This was largely defined by Bhimsen Thapa and the various buildings built during his reign as Prime Minister.	**The late-19th up to mid-20th century defined mainly by European neoclassical styles.** These were introduced by the Rana Prime Ministers and are often called Rana Style buildings.	The early modern buildings which would **span from the 1940s to the 1960s were largely defined by the early use of reinforced cement concrete.**	The contemporary **era focusing mainly on 1970s and 1980s** but could include more recent buildings if considered to be representative of the period, of outstanding quality and influencing the architecture field. This would include the **designs of International and national Masters.**

51

Modern architectural development in Kathmandu

Category -1

Kirtipur Tower [late 1770s] - Hanumandhoka Palace, Kathmandu

Balthak of Paltan Ghar (1777- to be confirmed) - Asan, Kathmandu

Bahadur Shah hall (1790s) - Patan Durbar, Lalitpur

52

Modern architectural development in Kathmandu

Category -1

Chhauni Durbar [National Museum] (1819) - Chhauni, Kathmandu

Dhukuti(1820s) - Hanumandhoka Palace, Kathmandu

Sisha Baithak (1826) - Hanumandhoka Palace, Kathmandu

53

Modern architectural development in Kathmandu

Category -2

Singha Durbar [Parliament] (1903) - Ramshah Path, Kathmandu

Gaddhi Baithak (1908) - Basantapur, Kathmandu

Gallery Baithak (1937) - Naxal, Kathmandu

54

Modern architectural development in Kathmandu

Category -3

Saraswati Sadan (Bed Prasad Lohani 1943) - Ranipokhari, Kathmandu

Tribhuvan University Central Library (Robert Weise 1963) – Kirtipur

55

Modern architectural development in Kathmandu

Category -3

Laboratory School (Benjamin Polk 1965) – Kirtipur

Hotel Soaltee- original block (Ganga Dhar Bhatta and Shankar Nath Rimal 1966) - Kalimati, Kathmandu

56

Modern architectural development in Kathmandu

Category -3

Rastriya Sabha Griha [Ganga Dhar Bhatta 1967) - Pradarsani Marga, Kathmandu

Narayan Hiti Royal Palace (Binoy K. Chatterjee and Benjamin Polk 1969) - Durbar Marg, Kathmandu

Ministry of General Administration (Shankar Nath Rimal 1960s) - Singha Durbar, Kathmandu

57

Modern architectural development in Kathmandu

Category -4

1st Stream	2nd Stream
Early foreign architects. **Carl Pruscha :** UNDP assignment to produce the first urban development plan for the Valley in the late 60's, Taragaon, CEDA. **Robert Weise:** Annapurna Hotel, The Yellow Pagoda Hotel, the Nepal Army Headquarters. **Gotz Haagmueller:** Bhaktapur Development Project, design innovations in adaptive re-use of historic buildings in Patan, Bhaktapur and Kathmandu.	**Works of internationally renowned architects, who were contracted by international aid agencies or organizations** to design specific buildings or complexes in Nepal within a limited time frame. **Kenzo Tange:** Master Plan of Lumbini, Buddha's Birthplace. **Louis I. Kahn:** The Family Planning Centre. **Tadao Ando:** Women's and Children's hospital in Butwal

58

Modern architectural development in Kathmandu

Category -4

3rd Stream	4th Stream
Relates to the execution and construction of the projects and brought their own consortium of architects/consultants to ensure a certain standard in design and construction. **JICA:** Teaching Hospital Campus, the Sano Thimi Tuberculosis Centre and the Disaster Mitigation Centre **Government architects from India:** General Post Office building, the telecommunications buildings, and hospital projects like the Bir Hospital, the BP Koirala Institute of Medical Sciences in Dharan, and more recently, the New Trauma Centre in the Bir Hospital. **Chinese Government:** Birendra International Convention Centre and the new Civil Employees' Hospital. **Other projects:** International Terminal Building of the Tribhuwan Airport and embassy buildings.	**Relates to commercially driven large construction projects, promoted by the Private Sector.** In this category of work, the foreign architects have worked for Clients based in Nepal, financed by Nepalese Banks, constructed by mainly Nepalese contractors and approved by Nepalese authorities. **Projects:** Large hotel projects like Soaltee, Taragaon Hyatt Regency, Radisson, Yak and Yeti and the Fulbari Resort.

59

Case Studies- International and National

Saynatsalo Town Hall, Alvar Aalto, 1952
(Theoretical realm)

Taragaon complex, Carl Pruscha, 1964
(Observational realm)

60

INTRO

Alvar Aalto

- Finland's most influential architect.
- Regionally influenced modernism, with a **phenomenological approach to design** that possessed a distinctly Finnish character.
- Favored **organic materials** like brick, stone, or timber.
- Kenneth Frampton categorized Aalto's **Saynatsalo Town Hall** in his essay among the work of **20th-century critical regionalist architects.**

Carl Pruscha

- An Austrian architect, dedicated his professional career to investigate and work closely in the field of **regional architecture in the eastern world.**
- One of the foreign architects, was sent to Nepal in 1964 by UN to serve as an expert consultant to the government.
- Taragaon complex at Bouddha by him can be taken as one of the **earliest modern architectural designs in Kathmandu.**
- Deeply understood different aspects of the valley architecture and reinterpreted it in his designs

61

DESIGN INSPIRATIONS

Alvar Aalto

- Studied architecture at the Helsinki University of Technology, graduating in 1921.
- Journey to Italy sealed an **intellectual bond with the culture of the Mediterranean region** that was to remain important to Aalto for the rest of his life.
- **Started off with Nordic Classicism + following works of Le Corbusier's modernism = Nordic Modernism**
- Design of Säynätsalo Town Hall was influenced by both **Finnish vernacular architecture and the humanist Italian renaissance >> modernism + regionalism** >> paved the way for 'Critical Regionalism'

Carl Pruscha

- Studied from 1955 to 1960 at the Vienna Academy of Fine Arts.
- MA in Urban Design in 1964 at the Harvard Graduate School of Design.
- Struck by a presentation of Bernard Rudofsky in an exhibition, 'Architecture without Architects" >> **preferred to gaze into the past of anonymous architecture in order to find new directions.**
- Design of Taragaon >> by recognizing the qualities of an intact urban form of Kathmandu valley and **reinterpretation of valley architecture into modern form.**

62

DESIGN CONTEXT

Alvar Aalto

- In 1944 Aalto was commissioned to design and implement a town plan for Säynätsalo, a small factory town, located on a small island in central Finland's Lake Päijänne >> **Aalto won a government-mandated competition for its design.**
- Complex was to comprise a **council chamber, local government offices, a community library, staff apartments, and retail space.**
- Designed a building celebrating European democracy >> included a large public space, along with sections dedicated to the public.
- Acknowledged the importance of the voice of the common public.

Carl Pruscha

- Came to Nepal in 1965 as a United Nations adviser for 1 year>> extended to 10 year.
- Primary involvement >> **development of the master plan of Kathmandu valley** and to help Nepal in preparing a **detailed inventory of the valley's monuments and cultural sites.**
- Private project - Taragaon >> in 1971 when Ambika Shrestha, the chairwoman of Nepal Women's Organization had idea to **create a Newar village in a nutshell, in which visitors from the West could be housed for some time: artists, writers, scientists, researchers and people interested in religion.**
- Attempt to blend physical, cultural and spiritual landscape of the valley while maintaining its contemporary expression.

63

PLANNING

Saynatsalo Town Hall

Taragaon complex

64

PLANNING

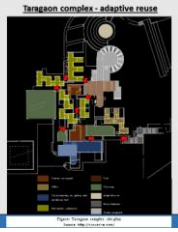
Saynatsalo Town Hall

Taragaon complex

65

PLANNING

Taragaon complex - adaptive reuse



66

BUILDING FORM

Saynatsalo Town Hall

- Massing and layout from the **"Court and Tower"** model of civic space found in Venice
- **Library and civic programs facing onto a central square** mirror a similar arrangement in the Piazza Vecchia of Bergamo >> **council chamber**, a double- height space **(17m high)**
- Each wing of the building was given an irregular geometry by the **use of setbacks cantilevers or oblique walls** so that the whole design evokes the tensions and complexity of an urban landscape

67

BUILDING FORM

Taragaon

- The design was influenced by the **form and function of the traditional Dharmashalas, barrel vaulted structures** which within the temple complexes served to shelter pilgrims – a kind of "Pati." ("Carl Pruscha",2017)**???**
- **Pitched roofs commonly found in the traditional valley architecture**
- Like **Kenzo Tange** used series of **cylindrical brick vault** in **Lumbini Museum** >> ***'Symbolism'*** in his design gaining the inspiration from the **'Chhaitya Hall'** >> Carl Pruscha might have **reinterpreted circular form of Bouddha stupa nearby**.

68

BUILDING FORM

Taragaon

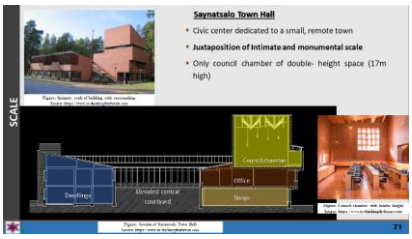
- Besides this standard type (brick barrel vaulted structures), **larger units have desk-like mono-pitched roofs reach to the ground** and are negotiable via steps on the side.
- Mono-pitched roof >> in contrast to doubled pitched Traditional newari architecture
- The shape mimics **continuation of terraced land form of the site.**

69

BUILDING FORM

Taragaon

- The two larger common buildings holds café and contemporary art gallery/ exhibition hall
- Juxtaposition of different forms


SCALE
Saynatsalo Town Hall
Civic center dedicated to a small, remote town
Juxtaposition of Intimate and monumental scale
Only council chamber of double- height space (17m high)
Council chamber
Office
Shops
Elevated central courtyard
Dwellings
71


SCALE
Taragaon
Single storey brick barrel vaulted units – 3.3m high
Double height mono-pitched roof units
Central courtyard size with respect to single storey unit
72


SCALE
Taragaon
Courtyard near Contemporary art gallery= 2xCentral courtyard
Double and triple height in café and contemporary art gallery
73

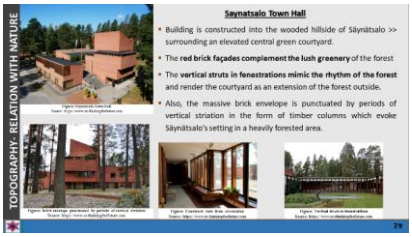

MATERIAL AND TECHNOLOGY
Saynatsalo Town Hall
Dark red brick, highlighting the local industries, and highlights it with wooden, copper, and stone used in floors.
Bricks were even laid slightly off-line with recessed mortar to create a dynamic and enlivened surface condition due to the shadows
Building is housed within a heavy brick envelope >> the courtyard is bordered by a glass-enclosed circulation space which can be linked to the model of an arcade-bordered Piazza.
74

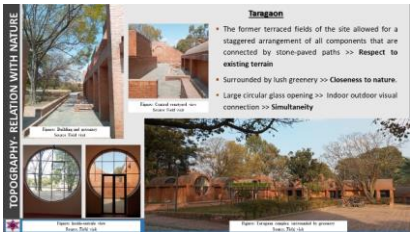

MATERIAL AND TECHNOLOGY
Saynatsalo Town Hall
Designed butterfly truss, supporting both the roof and ceiling
The butterfly truss eliminates the need for multiple intermediate trusses >> a main beam combining the effect of 16 secondary side beams
75


MATERIAL AND TECHNOLOGY
Taragaon
Chinese kiln-fired red bricks >> instead of Dachi brick predominant building material since many centuries, giving Kathmandu valley its unique position among all Asian towns.
Barrel vaults are made up of two layer of brick on edge.
6"x6" Telia brick tile on flat and pitched roof
Stone paved paths and courtyard
Cable support in café and contemporary art gallery block for support free, open double height space, also for roof support
76


TYPOLOGY: SOCIO CULTURAL
Saynatsalo Town Hall
Civic complex for the town.
Functions >> council chamber, local government offices, a community library, staff apartments and retail space >>
Design to represent democracy and the people's relationship with the government which is why Alto included elevated central large public space
bridges the gap between the public and bureaucracy by throwing open the genius loci of the layout to the common man.
The western staircase with irregular footprint, and is made of terraced sod held back by wooden planks >> evokes notions of ancient Greek and Italian architecture through the establishment of a form resembling a simple amphitheater condition(Koner 2020)
77


TYPOLOGY: SOCIO CULTURAL
Taragaon
Reinterpretation of courtyard planning in traditional valley architecture >> Sense of place preserved >> Sense of open-ness, familiarity
Space for social interactions >> performances, book launches and social gatherings
Multiple entry points
78


TOPOGRAPHY: RELATION WITH NATURE
Saynatsalo Town Hall
Building is constructed into the wooded hillside of Säynätsalo >> surrounding an elevated central green courtyard.
The red brick façades complement the lush greenery of the forest
The vertical struts in fenestrations mimic the rhythm of the forest and render the courtyard as an extension of the forest outside.
Also, the massive brick envelope is punctuated by periods of vertical striation in the form of timber columns which evoke Säynätsalo's setting in a heavily forested area.
79


TOPOGRAPHY: RELATION WITH NATURE
Taragaon
The former terraced fields of the site allowed for a staggered arrangement of all components that are connected by stone-paved paths >> Respect to existing terrain
Surrounded by lush greenery >> Closeness to nature.
Large circular glass opening >> Indoor outdoor visual connection >> Simultaneity

LIGHT

Saynatsalo Town Hall

- "Throughout history, considered articulation of natural light has produced architectural environments that move the human spirit. These transient moments in space connect people to the external environment and the rhythms of nature." (McKinlay, 2015)
- Dramatic play of light and shadow on the building surface, created by surrounding greenery.
- Play of **direct, indirect and diffused natural light** in the building.

LIGHT

Taragaon

- Courtyard is not fully over casted by building shadow >> Newari traditional courtyard.
- Buildings' form and arrangement make beautiful play of light and shadow.
- Well lit interior space with view of greenery.
- Semi-open gallery space >> modern need.

CLIMATE

Saynatsalo Town Hall

- **"Courtyard employs as ingenious natural cooling strategies in hot climates** (Raydan et al's Courtyards: A Bioclimatic Form, 2006)" (Passe 2012, p.5), **Aalto also ensured that they could also act as "ingenious warming strategies' in colder climate.**
- Architectural motive to create an "**opening to the sky**" suitable for the Finnish climate.
- The low height closed Northwest corner act as a protection from detrimental winds while allowing the low angle of the Northern sun to penetrate and warm the whole inner space.
- The courtyard also creates a **microclimate** while still enabling **natural ventilation** from the warmed inner courtyard through the circulation space of the corridor into the offices.

CLIMATE

Taragaon

- Warm temperate climate in Kathmandu.
- **"The Newar architecture was perfectly proportioned to their needs. It basked in the sun in those open courtyards and breathed the air that passed through those narrow alleys."**
- **Solar radiation combined with thermal mass of the building** is well practiced in traditional valley architecture, to keep the indoor temperature at a comfortable level.
- **Homogenous mass of bricks >> wall as well as vaulted roof >> considerable cooling effect.**
- Openness of the rooms at both ends allows **ideal transverse ventilation.**
- North-South arrangement of vault structures >> cutting out unwanted glare from West through circular opening.

PHENOMENOLOGICAL APPROACH

Carl Pruscha's source of experience

- Came to Nepal in 1965 as a United Nations adviser for 1 year>> extended to 10 year.
- Primary involvement >> **development of the master plan of Kathmandu valley** and to help Nepal in preparing a **detailed inventory of the valley's monuments and cultural sites.**
- Published two volumes >> basis for UNESCOs declaration of Kathmandu Valley as a World heritage site >> "Kathmandu Valley: Preservation of the Physical Environment and Cultural Heritage, a Protective Inventory".
- **Highly inspired by the art, architecture and tradition of the valley.**
- Compact and dense settlements with a **definitive urban character** (Chitrakar, 2006; Shrestha et al., 1986).
- Towns were laid out on the highlands, preserving the fertile agricultural low lands.
- Exhibits a fine grained network of urban blocks interspersed with a **series of interconnected squares or courtyards.**

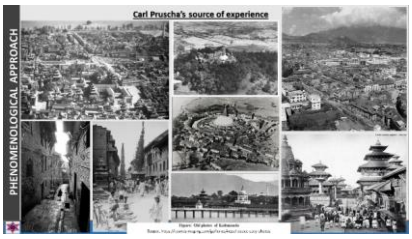
PHENOMENOLOGICAL APPROACH

Carl Pruscha's source of experience

- Equipped with **community amenities** (well, public tap, etc.) and **religious structures** (temple, square platform, rest place, etc.), they have become the **stages for interacting** different age groups at different period of time and seasons.
- Also, **street width to building ratio within range**– brick exposed façade, vertical oriented wooden windows and sloped roof with little variation on rooflines –contribute to the formation of **'sense of enclosure'** and **'human scale' for pedestrians.**
- The compact built form, the mixed-use concept and uniformity in design gave the traditional urban form its **well-defined identity.**

PHENOMENOLOGICAL APPROACH

Carl Pruscha's source of experience



PHENOMENOLOGICAL APPROACH

Carl Pruscha's source of experience

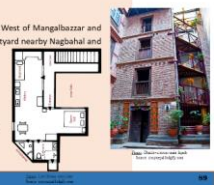
- To those entering it for the first time, Kathmandu Valley must have seemed a city left untouched since the middle ages.
- To those who laid eyes on it for the first time, the Capital must have been an exotic land, a place unlike any other in the world. **It was these eyes, foreign eyes like Carl Pruscha that recognized the wonder of what must have been a beautiful and exceptionally unique city,** which presented the first documentations of Kathmandu and its periphery. The foreigners who came here at the time studied the Valley's culture and recorded it for posterity (Chettri 2019).
- Deeply understood different aspects of the valley architecture and reinterpreted it in his designs to develop modern language of architecture in the valley.

Case Studies- National (observational realm)

Dhakhwa House

- **Restored, 108 years old house**
- **Location:** Historical center of Patan, 500m West of Mangalbazzar and 500 East of Patandhoka, is nested in a courtyard nearby Nagbahal and the Golden Temple.
- **Owner:** Mr. Prakash Dhakhwa
- Totally neglected for more than 10 years
- Restored in 2012 AD, in traditional way

with minimal interventions as far as possible.



Case Studies- National

Architectural expression

- **C – shaped plan** of this house incorporates **private courtyard**. Additionally, the house is connected to two other residential courtyards, in West and South >> Main entry from Western courtyard.
- Front façade has single window and balcony space, in each floor >> balcony space is added later during restoration, where there was staircase earlier.
- **Main entry > *Dalan* > Private courtyard > Staircase block**
- First floor: Kitchen/ dining and a guest room with attached toilet
- Second and third floor are identical, developed as studio apartment with a toilet and small kitchen space.

Case Studies- National

Structural expression

- **Load bearing structure** with 24" and 18" wall.
- During restoration, the building is structurally **retrofitted with metal framing from inside.**
- Additional structures such as balcony, staircase block and passages are of metal structure.
- In order to reduce load of the floor, thick mud flooring is replaced with 2" concrete over metal decking.
- **Removal of the traditional slope roof** with flat 2" slab over metal deck.

Case Studies- National

Current building use

- Dhakhwa believes that, tourist wants to explore the culture of here. Instead of staying in star hotels, they prefer such local accommodations >> only need comfort (sleeping, well communication and cleanliness).
- **As tourist accommodation** >> with direct friendly and homely interaction with owner.
- Guests participate in kitchen experience with owner, Raksi making, etc. >> also organizes alley and interconnected courtyard tour.
- Only accepts **short-term guests** (staying maximum 2 weeks) >> idea is, more guests to experience the place within a year, at reasonable price.

Field work - Interviews

Prof. Sudarshan Raj Tiwari
- Senior conservation Architect, with over 38 years of teaching experience

Ar. Prabal Thapa
- Chief Architect of Prabal Thapa Architects.

Ar. Deepak Panta
- Professor (Retired) at Department of Architecture, Institute of Engineering (IOE)

Ar. Arun Dev Panta
- Chief Architect of Design Cell Pvt. Ltd

Ar. Bibhuti Man Singh
- Chief Architect of Technical Interface
- Former President of the Society of Nepali Architects (SONA)

Interviews - Prof. Sudarshan Raj Tiwari

- **Kathmandu valley, qualified as region**, is far more different from other Indian sub continental countries; climatically as well as socio culturally.
- Culture of Kathmandu can be taken as local as well as national character.
- **Though Pruscha's buildings are remarkable, Tiwari thinks, they are overrated by Nepalese** >> We see early modern works by early architect-engineer at the time of 50s- 60s not being highlighted properly.
- Chinese brick production was just started at that time. Tiwari doubted, **"Whether brick exposure by Pruscha as his architectural creativity or its just because Chinese bricks as available material that was better than any other traditional bricks???"**
- It's understandable that embodied energy should be less in today's context but **random use of imported materials in the name of sustainability and rapid construction, is stupid.**
- **Difficult to identify relevance of critical regionalist buildings.** Latest example: 2022 Pritzer prize winner African architect, Diébédo Francis Kéré >> He responded to the modern materials' domination over African climate and tried to do architecture that respect African context with the use of both modern and local material.

Interviews - Ar. Prabal Thapa

- Although Carl Pruscha had general idea about climatic idea about the Kathmandu, **scale and form of the building seems important to him.** Because no overhang is provided and problem of leakage also.
- Architectural identity is affected by socio cultural aspect. **Traditional ideas to incorporate in modern planning** >> certain ideas can be reinterpreted. Such as understanding the importance of courtyard, interaction spaces should be developed which strengthen relationship among community members.
- Traditional brick has one problem >> not carbon efficiency
- Material not only helps in defining regional architecture, but mostly defines the form itself.

Interviews - Ar. Deepak Panta

- **Site itself guides built form** and the built form should respond to the site context.
- Normal brick façade with clean lines and plane looks more authentic.
- **Proportion and scale are the two aspects of traditional architecture, that should learn to maintain well in modern buildings also** >> Taragaon complex, scale, composition and the way building has responded the central courtyard, it can be taken as new interpretation of traditional architecture.
- New modern material succeded in breaking limitations of traditional materials >> height, span, combination of different forms.
- Panta claims that **Pruscha was the first early architect who interpreted traditional Kathmandu valley architecture into new modern way.** With reintroduction of brick, he brought up new skill of English bond (Header- stretcher bond) >> So, **brick not only reintroduced as material only, it reintroduced as new technology also.**
- **Designing neglecting the climate is a blunder mistake** >> Taragaon, even though overhangs are not provided, windows has been recessed in order to protect from rain. Also, provision of gutter at edge of vault is constructed in good way but doubted about large circular glass windows' performance on heat exchange.

Interviews - Ar. Arun Dev Panta

- **Site and context define the organic pattern of the Nepalese settlement** >> Eg: settlement pattern of hilly areas, layout of settlements follows up terraces and contours of hill.
- **Carl Pruscha, Kenzo Tange used vault** but its difficult to maintain and it became alien form for Nepal. Except, its **good example of experimenting contemporary form.**
- **Contextualizing the site is important.** Developing modern forms everywhere destroys the urban fabric.
- Going horizontal as much as possible for Kathmandu's context >> **break down to small scale.** CEDA building geometrically fine, but totally out off context. Scale is large. Too much of a pure form >> larger scaled place making projects which need enough space.
- Taragaon is more acceptable because it is broken into smaller fragmented pieces, feels more in context and appropriable.
- **Addressing the changing demand, think for what we are designing.**

Interviews - Ar. Arun Dev Panta

- Selection of new material - **"I want to make building that last generations."** >> It's stupid going for American style 30-year life span building with modern light weight prefab materials
- Traditional technology – much more eco-friendly system.
- For climatic aspect in modern context also - passive technique of natural ventilation is effective. Building orientation for cutting off excessive glare but heat is gain is ok for winter.
- Being valley isolated from rest of the world, **the traditional valley architecture developed here is purely indigenous.**

Interviews - Ar. Bibhuti Man Singh

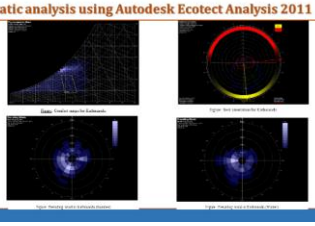
- **No architect can be entirely modern or traditional; his works always respond to specific contexts** >> Pruscha's modern interpretation of Newari architecture >> result of understanding about Kathmandu valley deeply.
- Modern structures reflect Nepali architecture ?? **"Extract whatever we can at a minimal cost and put that into modern structures to still retain the traditional air and art.** Nepali architecture would not reflect so much in a single house as it would in a cluster of houses where you could see and feel the true traditional ambience." - Ar. Bibhuti Man Singh
- **Architecture should spring from site regarding its local fabrics.** Singh strongly disagrees with architects who goes totally out of context, in order to satisfy personal narrative story.
- Unornamented brick structure Taragaon represents modern style of building in Kathmandu >> also thinks whether concrete would have been stronger and more water proof on vault.
- **Singh doesn't think of climate as a strong determinant of form in Kathmandu.** Climate of Kathmandu has been so kind to us.

Interviews - Ar. Bibhuti Man Singh

- So many determinants for contextual modern architecture. Singh thinks of main 3 determinants.
  1. **Ecological responsiveness.**
  2. **Civic aim**
  3. **Cultural reference**
- Singh also finds traditional Newari architecture as basepoint for Nepalese identity. Further he adds, since we are fond of external beauty of building only, it's **hard to recognize critical regionalist building without in-depth study.**
- In this modern age, Singh agrees **going with the modern trend but the roots to our cultural reference should not be forgotten.**

101

Climatic analysis using Autodesk Ecotect Analysis 2011



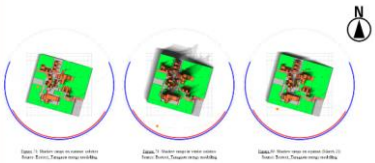
102

Taragaon

- Taragaon complex is oriented 15.5 degrees West of South >> 20.5 degrees of difference between site condition and best orientation suggested as per weather data.
- Hotel Hyatt Regency, oriented in same angle >> responded to East boundary of the site, considering Bouddha stupa as view.

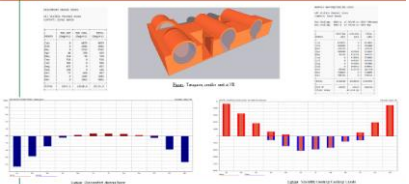
103

Taragaon



104

Taragaon



105

Taragaon

	Normal condition	20.5 ° Orientation change – Best orientation
Discomfort Degree	6879 DegHrs in January. 536 DegHrs in June.	0.04% reduced in January. 0.75% reduced in June.
Monthly Heating/Cooling Loads	Heating load of 6824W in February. Cooling load of 4491W in May.	Heating load remains same. Cooling load 0.67% reduced in May.

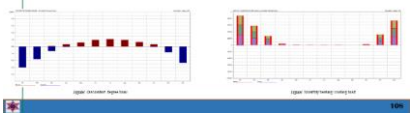
106

Dhakhwa House

- The building is C- shaped with private residential courtyard within.
- Longer face is oriented 60.5 degrees East of South>> 55.5 degrees of difference between site condition and best orientation suggested as per weather data.
- Indeed, the existing orientation of the building is guided by alignment of plot itself inside traditional core settlement.

107

Dhakhwa House



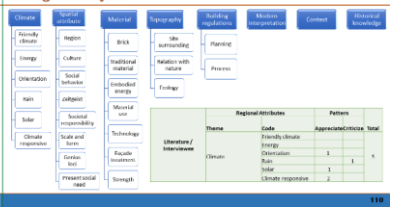
108

Dhakhwa House

	Normal condition	55.5 ° Orientation change – Best orientation	235.5 ° Orientation change – Best orientation
Discomfort Degree	4212 DegHrs in January. 1525 DegHrs in July.	0.14% reduced in January. Remains same in July.	0.83% reduced in January. Remains same in July.
Monthly Heating/Cooling Loads	Heating load of 5595W in January. No cooling load.	Heating load 0.16% increased in January No cooling load.	Heating load 0.68% reduced in January. No cooling load.

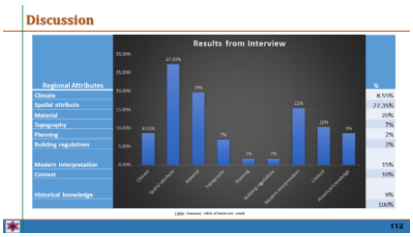
109

Coding for analysis

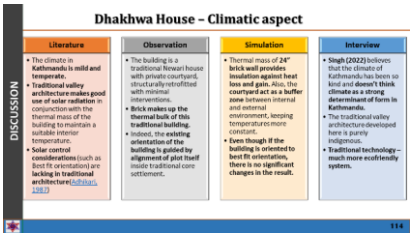


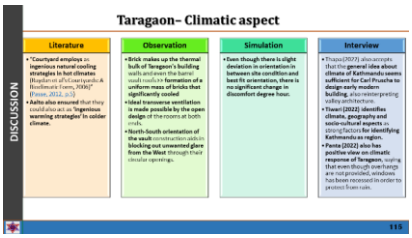
110

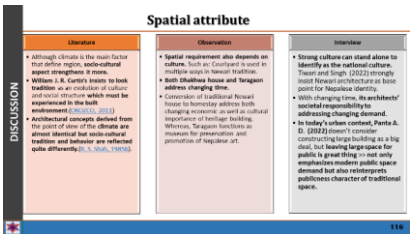

Findings
and Discussions

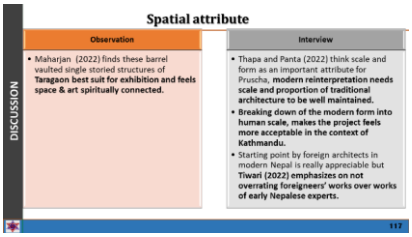

Discussion
Results from Interview
Regional Attributes
Climate
Spatial attribute
Material
Topography
Planning
Building regulations
Modern Interpretation
Context
Historical knowledge

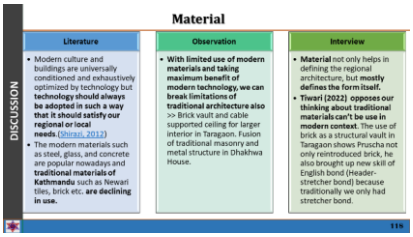

zeitgeist
societal responsibility
façade treatment
culture
form
relations
nature
present social need
historical knowledge
context
material use
technology
site
building regulations
strength
region
modern interpretation
social behavior
scale
friendly climate
brick
energy
traditional material
climate responsive
process

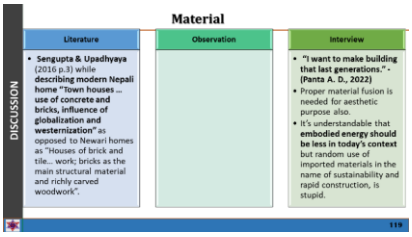

Dhakhwa House – Climatic aspect
DISCUSSION
Literature
Observation
Simulation
Interview

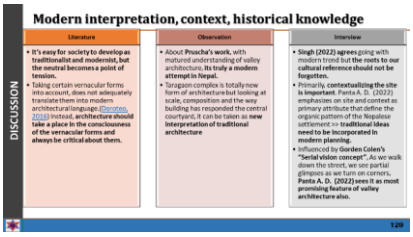

Taragaon– Climatic aspect
DISCUSSION
Literature
Observation
Simulation
Interview


Spatial attribute
DISCUSSION
Literature
Observation
Interview


Spatial attribute
DISCUSSION
Observation
Interview


Material
DISCUSSION
Literature
Observation
Interview


Material
DISCUSSION
Literature
Observation
Interview


Modern interpretation, context, historical knowledge
DISCUSSION
Literature
Observation
Interview

Conclusion and further study

- With Nepal opened up for modern development after Democratic Restoration in 1950, Carl Pruscha is among several foreign architects who came and worked, contributing to the modern architectural development of the country. **An Austrian architect, who claimed to have blended traditional cultural, geographic, and modern contexts, gained expertise and understanding of traditional Kathmandu valley architecture, has become a crucial source of knowledge for the development of early modern architecture.**
- Based on theories, among many regional attributes, three parameters: **Climate, Spatial attribute, and Material are considered to be the most important parameters.**
- The simulation result, field observation, and literature confirm that the **traditional Newari architecture is climate responsive.**
- Also, the result confirms that **Taragaon building which was claimed to have regional attributes,** this research confirms those assumptions from climatic perspective. So, **the building so far fits according to the climatic attribute of architecture regionalism for Kathmandu.**
- **However, orientation may be different for other buildings done by famous architects here, further research needs to be carried out.**

Conclusion and further study

- Although climate is the main factor that define region, socio-cultural aspect strengthens it more, which is also confirmed from the interview results. **In the context of Kathmandu, socio-cultural and material aspect seems more valued than climatic aspect** because in long run, the modern demand seems to affect the socio-cultural aspect.
- In this rapid technological advancing age and peoples' affinity more towards modern needs, totally going back to vernacular is not possible, but still there are many things that needs to be learned from traditional architecture. So, **there has to be compromise in between traditional method of doing things and advanced method of doing things**, consequently not to end up in the same way as western metropolis with number of modern problems.
- The research result sorted out-degree of importance among selected regional attributes. Moreover, it also emphasized the need of **other attributes such as context, topography, historic knowledge, and modern interpretation, for the development of regional modern architecture in Kathmandu.**

References

- Acharya, K. (2017). "Remembering what we've lost." from https://archive.nepalitimes.com/article/Nepali-Times-Buzz/remembering-the-kathmandu-we-have-lost,3804.
- Architecture, R. I. (1985). Regionalism in Architecture. Regional Seminar in the series Exploring Architecture in Islamic Culture, Dhaka, Bangladesh, Concept Media Pvt. Ltd.
- Askarizad, R. (2019). "Influence of Socio-Cultural Factors on the Formation of Architectural Spaces (Case Study: Historical Residential Houses in Iran)." 1: 44-54.
- Bahga, S. and G. Raheja (2018). "An account of critical regionalism in diverse building types in post-colonial Indian architecture." Frontiers of Architectural Research.
- Bahga, S. and G. Raheja (2020). "Complexities of practicing architectural regionalism in India: An interview study." Frontiers of Architectural Research: 568-578.
- Balooni, M. (2020) Significance Of Materiality In Architecture.
- Bani, M. (2015). CRITICAL REGIONALISM: STUDIES ON CONTEMPORARY RESIDENTIAL ARCHITECTURE OF KHARTOUM-SUDAN. Towards Sustainable Urban Development, Khartoum.
- Bhattarai, D. (2012). Concise History of Nepalese Architecture.
- Bodach, S., W. Lang, et al. (2014). "Climate responsive building design strategies of vernacular architecture in Nepal." Energy and Buildings 81: 227-242.
- Catalini, A., Z. Nour, et al. (2018). Cities' Identity Through Architecture and Arts: Proceedings of the 1st International Conference on Cities' Identity through Architecture and Arts (CITAA 2017), Cairo, Egypt, May 11-13, 2017. 1st International Conference on Cities' Identity through Architecture and Arts (CITAA 2017), Cairo, Egypt, May 11-13, 2017, CRC Press/Balkema.

References

- Chettri, R. (2019) TARAGAON MUSEUM: WENDING OUR WAY BACK
- ARTICLE.
- Chitrakar, R. M. (2015). TRANSFORMATION OF PUBLIC SPACE IN CONTEMPORARY URBAN NEIGHBOURHOODS OF KATHMANDU VALLEY, NEPAL: AN INVESTIGATION OF CHANGING PROVISION, USE AND MEANING. School of Civil Engineering and Built Environment
- Faculty of Science and Engineering, Queensland University of Technology. **Doctor of Philosophy:** 341.
- Craven, J. (2020). "Architecture Timeline - Western Influences on Building Design." from https://www.thoughtco.com/architecture-timeline-historic-periods-styles-175006.
- DORJI, K. E. (2016). IN PURSUIT OF SPIRITUALITY. Department of Architecture, Montfort Del Rosario School of Architecture and Design
- Assumption University. **Bachelor:** 79.
- Doroteo, I. (2016). "Literature Review of Kenneth Frampton's "Towards a Critical Regionalism"."
- Doyle, R. (n.d.). "What is the relation between vernacular architecture regionalism and Critical Regionalism?".
- Eggener, K. L. (2002). "Placing Resistance: A Critique of Critical Regionalism." Journal of Architectural Education (1984-) 55(4): 228-237.
- Elahe Zoghi Hoseini, D. D., Hamed Kamelnia, Mostafa Mokhtabad (2018). "New Trends in Critical Regionalism through the Lens of Tzonis and Lefaivre." Creative City Design 1.
- Elengical, J. (2022). "10 Critical regionalist architects around the world." from https://www.re-thinkingthefuture.com/know-your-architects/a3085-10-critical-regionalist-architects-around-the-world/.

References

- Erdiansyah, R. (2020). "The Rise and Fall of Modern Architecture." from https://[illegible].medium.com/an-essay-the-rise-and-fall-of-modern-architecture-9e0e0ce431e0.
- Farah, H. and K. S. S. Mohammad (2012). "Christian Norberg-Schulz and the Existential Space." International Journal of Architecture and Urban Development 1: 45-50.
- Fiederer, L. (2016). "AD Classics: Säynätsalo Town Hall / Alvar Aalto." from https://www.archdaily.com/783392/ad-classics-saynatsalo-town-hall-alvar-aalto.
- Frampton, K. (1983). Towards a Critical Regionalism: Six points for an architecture of resistance. In The Anti-Aesthetic: Essays on Postmodern Culture. Seattle, WA: Bay Press.
- Frampton, K. (1987). Ten Points on Architecture of Regionalism: A Provisional Polemic. Seattle, WA: Bay Press.
- Fu, C.-C. (1990). REGIONAL HERITAGE AND ARCHITECTURE - a critical regionalist approach to a new architecture for Taiwan, University of Edinburgh. **Ph.D.:** 487.
- Ghinita, A.-M. (2016) How buildings influence society and how society is influenced by buildings - an introduction.
- Ghodsi, H. (2012). Vernacular Architecture: Solution to a more sustainable future, Scott Sutherland School of Architecture. **Masters:** 89.
- Giamarelos, S. (2022). Resisting Postmodern Architecture
- Critical regionalism before globalisation, UCL Press.
- Groat, L. N. and D. Wang (2013). Architectural Research Methods. New Jersey, John Wiley & Sons, Inc.