

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
DEPARTMENT OF ARCHITECTURE
PULCHOWK CAMPUS



A REPORT
ON
FARMERS' MARKET
“Connecting Farm and Community”

SUBMITTED BY:

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SUBMITTED TO:

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TRIBHUVAN UNIVERSITY

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April, 2023

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Subject: Approval for Final Thesis Presentation

Dear Sir/Madam,

In compliance with the requirement of the course AR 851 (V Year Architectural Design Thesis) for the degree of Bachelor's in Architecture, I hereby respectfully present my thesis for evaluation and approval.

Project Title: **Farmers' Market: Connecting Farm and Community**

Project Location: **Surya Vinayak, Bhaktapur**

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ABSTRACT

Keywords: marketplace, hub, realms, placemaking, public space, socialization, design standards, infrastructures, inferences,

People's demand for markets has shifted as people's behavior patterns have gradually changed. The market is a hub for social interaction and living as well as a place where goods are traded. Markets have been an essential component of urban life for thousands of years, serving as a hub for commercial and social activity in many cities around the world, markets continue to play a crucial role in providing access to fresh food and supporting local economies.

Nowadays, market dominates the daily life of people. Farmers markets are becoming more prevalent. However, the design of farmers' markets is still unexplored in the context of Nepal. Even though an agricultural nation, Nepal imports a significant amount of agricultural goods every year. With the increasing population and demand for fresh food in Nepal, it is important to explore the architectural possibilities of farmers' markets to ensure that they can meet the needs of the community. This may involve creating designs that are adaptable, flexible, and sustainable, as well as incorporating accessibility features to ensure that all members of the community can access these spaces.

The main purpose of this paper is to take the marketplace as a research object and reflect on the situation and issues of the current marketplaces and the four physical realms that create it. Research on the history of farmer's market on the context of Nepal, issues in the current farmers' market and the marketing channels have been done through various case studies and the data were analyzed on the basis of those case studies. Also, case studies from national and international market were analyzed to understand the importance of placemaking in a market. The research aims to identify how creating market as a public space incorporating vibrant spaces in the market foster activities, social interactions, and dynamic connections among the varied resident populations. The design aims to provide better opportunity to the local vendors so that the residents could directly interact with the famers and get more fresh produce at cheaper price without having a third party involved.

The findings of this report can help in widening the horizon of knowledge on designing markets as public infrastructures. Finally, this report aims to study about the market realms and spaces, which integrates people's daily needs through proper functioning and flow.

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FARMERS' MARKET

“CONNECTING FARM AND COMMUNITY”

1. INTROCUCTION

“GREAT MARKETS MAKE GREAT CITIES, AND VICE VERSA”

A market, sometimes known as a marketplace, is a gathering area where people buy and sell food, cattle, and other items. Some markets operate every day and are referred to as perpetual markets, while others operate once a week or on less often occurring days such as every week and are referred to as periodic markets. The population, culture, environment, and geographic factors all influence the design of a marketplace. The term marketplace refers to several types of trading, such as market squares, market halls, and food halls, as well as their various variations. Thus, marketplaces can exist both outside and inside the cutting-edge globe, as well as on-line marketplaces.

The marketplace is the world's oldest retail trading format. Its ancient origins lie in the sale or barter of surplus produce, once agriculture had changed society's basic hunter-and-gather pattern. Market towns, once established, quickly became an important feature of rural life. At the same time, they also became vital centers of social and community life; places where people would meet and exchange not only goods, but information and stories, too. In Britain, the central square or gathering places in many towns is still called the ‘marketplace’, whilst many towns have the word 'market' as part of their name:

Market Drayton or Market Harborough, for example. (Tomlinson, 2021)



Figure 1 : Well-Functioning Market Concept

Source: <https://123dok.com/document/zk80p91z-creative-sustainable-traditional-market-design-in-malang.html>

In context of Nepal market trend has changed drastically over the period of time. Some marketplaces have created the focal point of the town and some places in the valley are known as Market towns: Mangal Bazar, Bagh Bazar, Ason.

In recent times, farmer's markets have also seen a resurgence, answering the demand for freshness, lower prices, a direct exchange with the grower, as well as responding to a certain consumer nostalgia. Their contribution to local economies is of high value, as they lead to spending in nearby shops, generating further tax revenue. The increased popularity of farmer's markets also contributes to the sustainability of communities. Local growers are supported, and food does not travel from afar, so that emission levels are reduced. Produce to be sold directly by the grower does not have to be chemically treated to increase its shelf life, which improves overall public health. Farmer's markets create jobs, build new businesses, strengthen and diversify regional agriculture, and elevate farm profitability. (Tomlinson, 2021)

1.1. Need: Identification/ Justification

The population is rapidly growing, which has an impact on market demand via price and supply elasticity. The necessity for well-designed marketplaces is unavoidable in order to secure sufficiently nutritious food supply chains, tackle the problem of street sellers, and assure sustainable growth.

When it comes to market architecture, contemporary markets demand efficient designs that can integrate markets as essential pieces of public realm space into diverse and mixed-use areas. Architecturally, in addition to trading space, a market needs to facilitate engagement with communities and provide space for meetings and the exchange of information, as well as respecting health, safety and hygiene requirements, and the need for Sustainable food waste processing systems which is lacking in present market places. (Tomlinson, 2018)

Farmer's markets are becoming more popular, but they require some architectural intervention to function well. The image of the market is unsanitary, disorganized, dirty, and full of urban concerns, so a well-managed market place is required to overcome this misperception. Although located close to rich agricultural lands, urban areas often lack a permanent place to provide people with fresh, locally sourced foods. The architecture of the existing markets that may be those steel trusses markets or any super markets only concerned with economic exchange, they offer nothing for the social exchange and social cohesion between the layers of the community

Human being is a social animal, they need social interaction. According to research, social interactions are critical for our mental health and well-being. People nowadays enjoy leisure time less frequently and have even less time for socialization as a result of their hectic lifestyle. With food still being a significant part of daily life, we can take advantage of people's travels to markets to force them to socialize. The recent uptrend in farmer's market culture supports the facts that people still like the hands-on experience of shopping contrary to what supermarkets of today provide. In many cultures, marketplaces have long served as places where people can come together to buy and sell goods, exchange ideas, and interact with others. Similarly, a well-designed market can improve people's quality of life by encouraging healthy lifestyles, creating economic possibilities, and strengthening urban-rural linkages.

1.2. Importance of the Research

The urban marketplaces are a relatively new architectural typology in the context of Nepalese cities, the research will be useful for future design references. Understanding the role, importance, and needs of current market architecture in the context of today's and tomorrow's globalized cities would be beneficial to designers and architects. It would assist in comprehending the significance of market centrality in cities and its relation to urban sustainable development.

This research helps in understanding the importance of public space in a farmer's market. While we design a market, it is essential that we create a space for community as well. Farmers markets can provide an excellent opportunity for socialization and community-building. These markets bring together local farmers, and producers to sell their goods directly to consumers, creating a unique space for social interaction and connection.

The research will help to get an understanding of how market design has evolved in terms of new requirements, planning, materials and technology, sustainability, and also helps to identify the need of space for social interaction.

1.3. Problem Statement

The globe is seeing the largest urbanization wave in history. Because Nepal is a developing country, uncontrolled urbanization and rising population density have a significant impact on urban food supply chains. Cities in Nepal are no exception, particularly Kathmandu, the capital. People's lifestyles, dietary preferences, and city architecture are all changing as a result of urbanization. People used to eat a healthier diet, but now they choose junk food. Even local vegetable markets are becoming scarce in city cores as modern urban planning focuses on supermarkets and city centers, limiting convenient access to healthful food. In today's supermarkets and major food stores, customers are given bland, antiseptic, and faceless shopping experiences. (Sommer, Herrick, and Sommer, 1981).

Nepal is an agricultural country, but it imports a huge number of agricultural products every year. Last year, this grew by more than 30%. The fundamental reason for this is that people's enthusiasm in agriculture is waning because there are few viable options for its upliftment. As a result, many Nepalese are emigrating, leaving their agricultural land barren. Farmers in Nepal are not given the attention they need, and as a result, their involvement in agriculture is decreasing, which has had a significant influence on the country's economy.

In context of Nepal, we can see that market is just considered as a social for buying and selling goods while Markets have the potential to serve as vibrant community spaces that bring people together and foster social interaction and connection. They can be places where people gather to share experiences, learn from one another, and build relationships. By incorporating a range of features and activities that foster social interaction, learning, and innovation, markets can help to build more vibrant and sustainable communities. This potential of market is yet to be explored.

In the lack of public infrastructure such as proper marketplaces, vendors and farmers must rely on the streets and pathways to sell their produce. This complicates quality assessment programs, making healthful food inaccessible to the general public.

In the valley, there is also an unmanaged system and cleanliness difficulties. Nepalese vegetable Farmer's and wholesalers bear heavy financial losses from the large-scale dumping of damaged and spoiled produce in wholesale markets. Nearly half of the produce that Farmer's ship to local vendors is dumped after a few days because it spoils quickly in the open-air markets. (Kandel, Yam k, 2016).

Unsold produce is dumped down the side of the walkways, producing an unsightly scene and an unhealthy environment. The lack of effective trash disposal services within the market facility generates an unsanitary and unpleasant environment, even though the garbage is cleaned routinely at the end of the day or the beginning of the next day. People going through the area may be injured as a result of the rubbish being hurled. In the current market areas across the city, there is a marked absence of management.



Figure 2: Problem in Farmer's Market

Source: <https://aims-to-reduce-massive-waste-of-produce-by-improving-handling-storage/>

Furthermore, there is currently no government department committed solely to the preservation, protection, and management of our market places. Kathmandu Metropolitan City has 15 permanent markets and 39 semi-permanent marketplaces. (World Urban Campaign, 2015) The city's market places are usually the most people-centric sites to be found. However, the architecture of these marketplaces is inadequate, resulting in the loss of the essential element of community space.

1.4. Objectives

The project's ultimate goal is to successfully combine market infrastructure with public amenities and space to create a community-driven infrastructure that creates place out of nothing.

- To create a marketplace that incorporates vibrant public spaces to foster activities, social interactions, and dynamic connections among the varied resident populations.
- To provide opportunities for small farmers and businesses to sell their products, and they help meet the growing demand for locally produced food.
- To minimize the amount of waste and pollution created by the rotten and residual part of the produce and also from the packaging for the supermarkets.

1.5. Proposed Methodology

A successful execution of any research follows certain methodologies that becomes the backbone of the whole project. Hence, review of basic prerequisites is mandatory. Following research methods will be pursued out of which required facts, data, codes of conduct and standards will be gathered, analyzed and employed in designing an urban marketplace. It is necessary to understand that, the process employed is not a linear process and the stages in the process are liable to review and revisit at any instance during the whole process of this design thesis.

1.5.1. Literature review

The literature review shall be done on existing literature available on marketplaces through various means of available sources like journals, articles, news articles, research papers, books, websites, blogs, dissertations and other sources. It shall be done in two main phases:

- **Preliminary literature review** includes literature review about the origin, history, typologies, mechanism and significance of marketplaces.
- **Detailed literature review** shall be more specifically oriented on the research topic and proposition which is to be finalized by the end of the preliminary literature review.
- **Data Collection:** facts and figures, technical data, design standards and design guidelines for design of markets were also intensively studied.

1.5.2. Case Studies

In this phase, case studies on various marketplaces and related structures will be made either through primary, secondary or tertiary data collection.

- **Primary case studies** shall be done through direct field visits and observations of various national market infrastructures located in and around Kathmandu valley.
- **Secondary case studies** shall include various marketplaces in regional and international contexts. The observations and data collection shall be done through books, journals, articles blogs and internet.
- **Tertiary case studies** shall include data collected through various national and international guidelines and standards, either be it whole or by partial studies

1.5.3. Design Development

This phase shall include development of conceptual framework, working out with space requirements and detail design development of architectural form and spaces based on the inferences from literature reviews made and case studies carried out.

- Development of conceptual framework.
- Working out with space requirements.
- Detail design development of architectural form and space.
- Final design drawings and final reports with conclusion

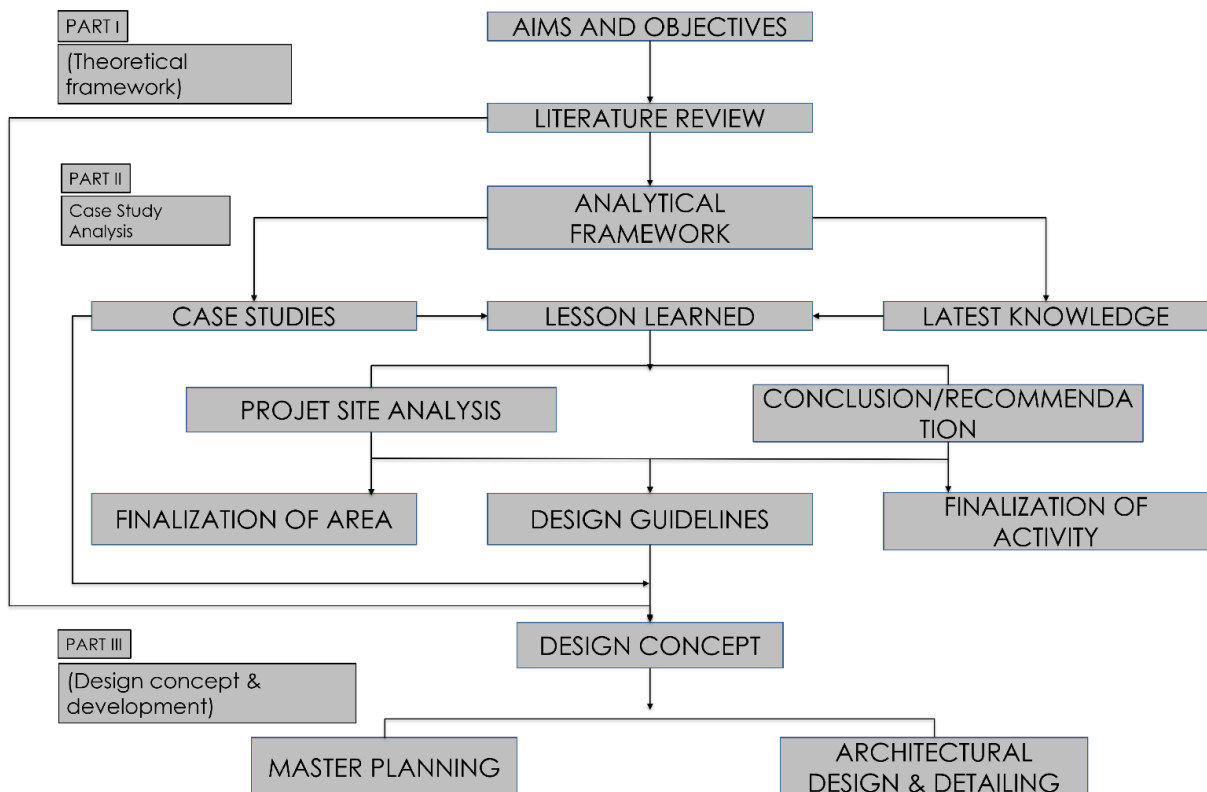


Figure 3: Methodology of the Project

1.6. Expected Output

- Gain a deeper understanding of urban marketplace architecture, which has received little attention in Nepal.
- Create a marketplace that incorporates vibrant public spaces to foster activities, social interactions, and dynamic connections among the varied resident populations.
- Provide opportunities for small farmers and businesses to sell their products, and they help meet the growing demand for locally produced food.
- Minimize the amount of waste and pollution created by the rotten and residual part of the produce and also from the packaging for the supermarkets.
- A market architecture that is more public-centric.
- A modern way to introducing market architecture for urban rejuvenation and long-term sustainability. Provide a holistic strategy to achieving a well-designed market place that can keep the community's uniqueness while also serving as a potential tourism destination.

2. LITERATURE REVIEW

The collecting of relevant data is critical for the effective design of any project. The marketplace and public space literature research cover the essential needs and design standards required for an efficient and effective market flow and the relationship between market and interactive spaces. The study of relevant literatures on the market place and placemaking such as history, architectural standards, current context, and special characteristics provided a deeper understanding of the marketplace and appropriate public spaces, assisting in a better design process.

The study of the marketplace's history provides a basic summary of how the market has evolved since its beginning and the significance it carried. Subsequent research into Placemaking validated the current necessity to connect public space and market.

2.1. History

Markets have existed for as long as the human civilizations since the ancient times as the practice of exchanging goods in order to fulfill needs. Before the invention of money, people used to exchange the commodities they had with the commodities they needed. For example, people gave away rice and grains exchange of salt and sugar, for vegetables etc. Similarly, people also exchanged goods for labor and skills. Exchange of commodities in early periods of human civilization brought forth the concept of trading. Eventually, it evolved into economic activities proceeding to the invention of money. Need of a place where trade can be carried out resulted in emergence of markets.

2.1.1. World History

The public market is the oldest retail trading venue in the world. Its beginnings can be traced back to the sale or barter of surplus produce after agriculture disrupted society's traditional hunter-gatherer pattern. After animals were tamed and crops were harvested, there was not only sustenance for the farmer's family, but also surplus produce for trade, weather permitting. Quickly became an important part of rural life once market towns were formed. At the same time, shops became important social and community gathering places where people met and exchanged not just things, but also information and tales. In many British towns, the major square or gathering place is still known as the marketplace, and several towns have the word 'market' in their name: Market Drayton or Market Harborough, for example. (Tomlinson, 2021)

A market town's major aim was to provide goods and services to the surrounding community, and their numbers grew rapidly throughout Europe from the 12th century onwards, thanks to a more urbanized culture and the widespread adoption of a cash-based economy. They generally developed up near fortified places, like as castles or monasteries, not just for the security they provided, but also because large-scale homes provided consistent demand for their wares. Markets appeared to operate for the benefit of all, attracting crowds and earning consistent cash, which attracted administrators and rulers, who saw their potential for generating tax revenue.

From the mid-16th century, the market's influence began to wane, owing to the establishment of permanent stores, which supplied clients with more consistent business hours. Furthermore, the growth of a merchant class resulted in the import and export of a diverse range of items from further afield, reducing reliance on locally produced goods. However, as a retail concept, markets have survived not only the arrival of the permanent shop, but also the growth of the town center high street, the supermarket, the shopping mall, and the out-of-town hypermarket, as well as the online revolution in recent years. Regardless, each new invention delivered a severe blow to the conventional market, as smaller traders were frequently unable to compete with or benefit from equivalent economies of scale. (Tomlinson, 2021)

The supermarket's arrival had a significant impact on both food consumption and purchasing behavior. Fresh produce and circumstances that fostered a tight-knit social fabric were sacrificed in favor of convenience and less-engaging human relationships. On weekends, busy families went to the grocery shop to fill up for the week. Because consumer nostalgia for the immediacy of the market did not fade, some supermarkets attempted to portray themselves as markets by modifying the way fruit was exhibited or even dressing personnel in period clothes. In addition to the normal aisles of canned goods and general produce, supermarkets began to replicate old-fashioned marketplaces by offering tiny fish and butcher markets as well as bakeries.

However, the market did not vanish as a result, and it is still very much alive and well - not only now, but for the foreseeable future as well, because no other format could completely replicate what the market has to offer. Humans are sociable creatures by nature. They enjoy getting out of the house and taking advantage of the social contact shopping opportunities, as well as browsing, grazing, touching, feeling, and testing what they are going to buy. Although convenience is an important element, it is not the only one at play. Folks can also talk directly to the people who produce the food at the market. Of moreover, markets aren't just about shopping. The change to wholesale after the industrial revolution permitted the formation of permanent trade marketplaces, allowing for predictable, continuous supply thanks to large-scale mechanical production and railroad links that allowed agricultural commodities to be transported over longer distances. The infrastructure for such marketplaces was likewise on a bigger scale, ranging from hangar-like warehouse areas with low-level racking for forklift trucks to outdoor roads and loading bays that connected to nearby transportation systems. This allowed the market to process, prepare, and dispatch bulk items in a narrow window of time during the early morning hours, ensuring that end-user customers had food in time to prepare for their paying clients.

Furthermore, markets aren't just for food and drink items. While both retail and wholesale markets have thrived for decades by being adaptable and responsive, as well as emphasizing their social and accessible aspects, the market principle of a group of specialized retailers converging in one location can be seen in a variety of enduring offshoot markets, including les markets, antique markets, flower markets, and even the stock exchanges of most major cities. There are numerous market trading lessons for retailers to learn. Where else can you learn more about your consumer than through interacting with them face to face on a daily basis and learning about their likes, dislikes, preferences, and frustrations? Many high-street stores, brands, and individuals got their start in business in market.

Even at the most luxurious levels of contemporary retail, markets have acquired a following. Rei Kawabuko and Adrian Joffe's 'Dover Street Industry in Mayfair' was a fascinating addition to London's fashion high-end retail market in 2004 (with sibling locations later launching in

Tokyo and New York). The specialized fashion market, a stone's throw from neighboring Bond Street's luxury, offers an anti-luxury setting of poured concrete, bare ceilings, and quirky fixtures, as well as an anti-luxury mentality of mixing high and low-end products. (Tomlinson, 2021)

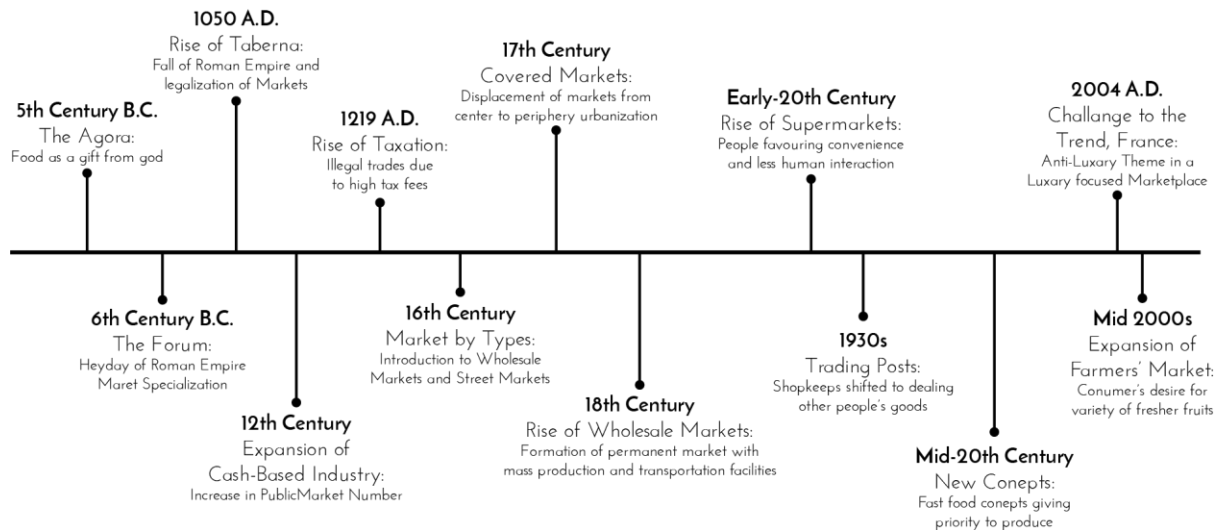


Figure 4: Timeline of world's history of market

Source: Author

2.1.2. In Context of Nepal

In Nepal, the market began as an agricultural trade where people exchanged good. The small trading business was taken up by the permanent market as demand increased. People appreciated the one-stop shopping experience given by supermarkets as their quality of life demands and hectic schedules increased. Nonetheless, at the moment, a rebound in the farmer's market may be witnessed, responding to the need for fresh goods.

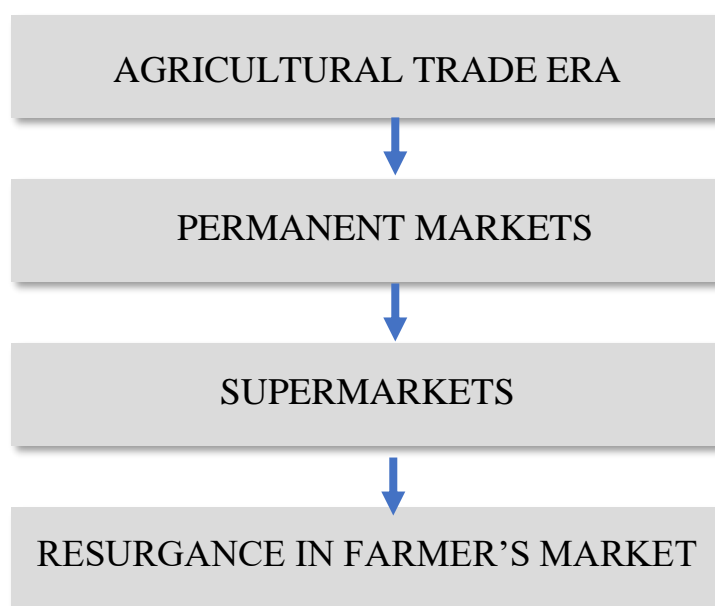


Figure 5: History of Farmer's Market in Nepal

2.1.2.1. Agricultural Trade Era

Because Nepal is an agricultural country, markets began as agricultural trade. In order to meet their necessities, people used to trade agricultural commodities. Because the majority of people were farmers, they used to sell their extra harvests to gain money. Similarly, the Kathmandu Valley was an old trade route to Tibet, which resulted in market towns, market squares, and civic squares becoming the focal point of settlements in the valley. Because the main streets functioned as marketplaces, residents in the main streets desired stores on their ground floors. Similarly, in old valley communities, open public spaces protected vendors for morning markets selling fresh produce and night markets selling non-perishables, which still exist today. These marketplaces served as the focal point for socio-cultural, religious, and economic activities, contributing to the development of a bustling precinct. Mangal bazar, Bagh bazar, Ason, Bandipur, and other localities in the valley are still recognized for their traditional markets: Mangal bazar, Bagh bazar, Ason, Bandipur, and others. During the agricultural commerce era, open and street marketplaces were common. (Khanal et al., 2020)



Figure 6: Agricultural Trade Era

Source: Facebook, we love Newars,
Newa Community

2.1.2.2. Permanent Market

Permanent vegetable markets, usually referred to as wholesale marketplaces, can be located in a variety of locations. It is a permanent sort of market with set locations and a well-defined region, as the name implies. It provides long-term protection and a set area for a big number of vendors all in one location. In comparison to semi-permanent marketplaces, they cover a huge area. Within the valley, there are various vegetable markets, the largest of which is the Kalimati Vegetable and Fruits Wholesale Market, which is run by the government. Since 2043 BS, it has served as a significant fruit and vegetable market. Other wholesale marketplaces (both primary and secondary) in Kathmandu may be found in the following areas: Balkhu, Koteshwor, Balaju, Chakrapath, Khusibu, and so on. (Khanal et al., 2020)



Figure 7: Kalimati Fruit and Vegetable Market

2.1.2.3. Supermarket

As a developing country, Nepal is not immune to globalization. For the acquisition and delivery of fresh product, the new towns and cities are more influenced by store culture. People like these kinds of marketplaces because they provide a one-stop shopping experience that is both hassle-free and time-saving. Bhatbhateni Supermarket is a well-known supermarket chain in Nepal. Because of the change from local to global food distribution, supermarkets have eliminated the need to feed the city through its public markets. Bhatbhateni Supermarket is a well-known Nepalese supermarket company that offers a variety of goods under one roof.



Figure 8: Bhatbhateni Supermarket



Figure 9: Big Mart

2.1.2.4. Resurgence in Farmer's Market

Farmers' markets are semi-permanent or seasonal markets where farmers can sell their products directly to consumers. Farmers' markets have seen a significant increase in popularity in recent years, as consumers increasingly want to buy organic items directly from the farmers. They also provide a better shopping experience, similar to that of traditional marketplaces, as opposed to supermarkets' faceless and dull experiences. The Farmers' Market's appeal is enhanced by the opportunity to interact and engage in social and cultural exchange. Farmers' markets like Le Sherpa Farmers' Market, Boudha Farmers' Market, Taragaon Organic Agro Market, Surya Vinayak Harit Krishi Thok Bajar and more.



Figure 10: Surya Vinayak Farmer's Market

2.2. Farmer's Market

“Farmers’ markets are generally considered to be recurrent markets at fixed locations where farm products are sold by farmers themselves.”

-Allisons Brown



Farmers' markets can now be found in a wide range of locations, including parking lots and vacant lots, commercial buildings and shopping malls, walkways and waterfronts, hospitals, parks, and plazas. In both large cities and small villages, they are increasingly being employed as strategic and geographical anchors for economic revival. Farmers' markets are becoming more prevalent in America, signaling a return to civic life and a chance to renew public space with social and cultural energy. (Francis & Griffith, 2011)

The primary consideration in deciding what constitutes a farmers' produce market has been whether farmers bring their own fruits and vegetables to a specific place designated for that use and then sell them there directly to customers or through an auctioneer. The public markets are similar to the farmers' markets, with the exception that the majority of the vendors are required to be farmers. (Pyle, 1971)

2.2.1. History

Markets have existed for as long as humans have engaged in the trade. The earliest bazaars are believed to have originated in Persia, from where they spread to the rest of the Middle east and Europe. Over the time and locations, marketplaces have gone through evolutions. Majorly, the Persian Bazaars, the Arabic Souqs, the Greek Agora, the Roman Forum remains in peak among the historic market architecture representing their respective cultural identity and have great influence in the evolution of market architecture around the globe.

Farmers' markets today still have the same basic idea as in the past, although they differ from other types as consumer commerce as a **whole change** with time. Similar structures predated the Industrial Revolution, although they frequently belonged to larger markets where producers of food and other items gathered to sell their wares. Trading posts were first established in the 1930s as shopkeepers shifted to selling other people's goods rather than their own. General and grocery stores carried on the specialization trend in retailing, maximizing the customer experience while further isolating it from production and the rising complexity of manufacturing. (Pyle, 1971)

The advantages of contemporary industrial food production over earlier processes rely heavily on contemporary, affordable, quick shipping and constrained product variability. However, delays and transportation fees cannot be avoided. Farmers' markets thus remained competitive with other kinds of food shopping in areas where distance limited the reach of industrial suppliers and where consumers had a strong preference for local variety. Farmers' markets have expanded as a means of food selling since the mid-2000s as a result of consumer desire for foods that are fresher (spend less time in transit) and more varied.

Farmers' markets have dramatically grown in scope and popularity in the United States during the past 20 years. There were 1,755 farmers' markets open in 1994, according to the U.S. Department of Agriculture. In 2009, fifteen years later, the amount increased by three times to 5,274 markets. Farmers' markets are currently seeing a rebirth, and with new legislation encouraging market development, standards for healthy eating, and the recently formed White House Garden and Farmers' Market by the Obama Administration, this trend is expected to continue. These traditional marketplaces were frequently excluded from the planning of official public open-space networks and seldom ever came under the purview of landscape architecture or urban design. Many markets were, and still are, at risk of being displaced due to construction pressures and the high cost of urban lands since they are situated in parking lots, on streets, beneath freeways, and in vacant lots. O'Neil argues, "preserving the market means preserving its use and its ecology. Markets require constant vigilance and protection from exploitative forces like rising real estate values and politics" (Francis & Griffith, 2011)

2.2.2. Benefits of Farmer's Market

By offering a regular, informal gathering space where trust may be built, a successful farmers' market has the capacity to strengthen neighborly ties. When locals observe a bustling market filled with bright, joyful individuals carrying bouquets and baguettes, it fosters a sense of pride. When specialized stores transition to a permanent storefront a few years later and have a solid local client base, it helps incubate new firms by providing cheap overhead. Additionally, it contributes to the creation of a destination close to other storefront companies, bringing customers to the area and allowing surrounding businesses a chance to make a sale.

Supermarket vs Farmer's Market

Supermarket and Farmer's market are two different types of market but providing similar products, that is, fruits and vegetables and some other services. Yet, both are different in terms of provision of services and products. On comparison what we can conclude is that supermarket provides bland, sterile, and anonymous shopping experiences whereas the farmer's market redefines the experience by interaction between consumers, producers, and merchant. Supermarket prioritizes traffic flow and thus eliminates the spaces where shoppers could hold conversations and farmer's market provides opportunity of direct interaction. ("A Supermarket and a Farmer's Market Comparison | Business Paper Example", 2022)

Sommer et al. identified a self-serving culture as promoting "the process of de-socialization that is, the elimination of opportunities for human interpersonal encounters in the marketplace is accelerating in retail settings in general, and in supermarkets in particular" (Sommer et al., 1981).

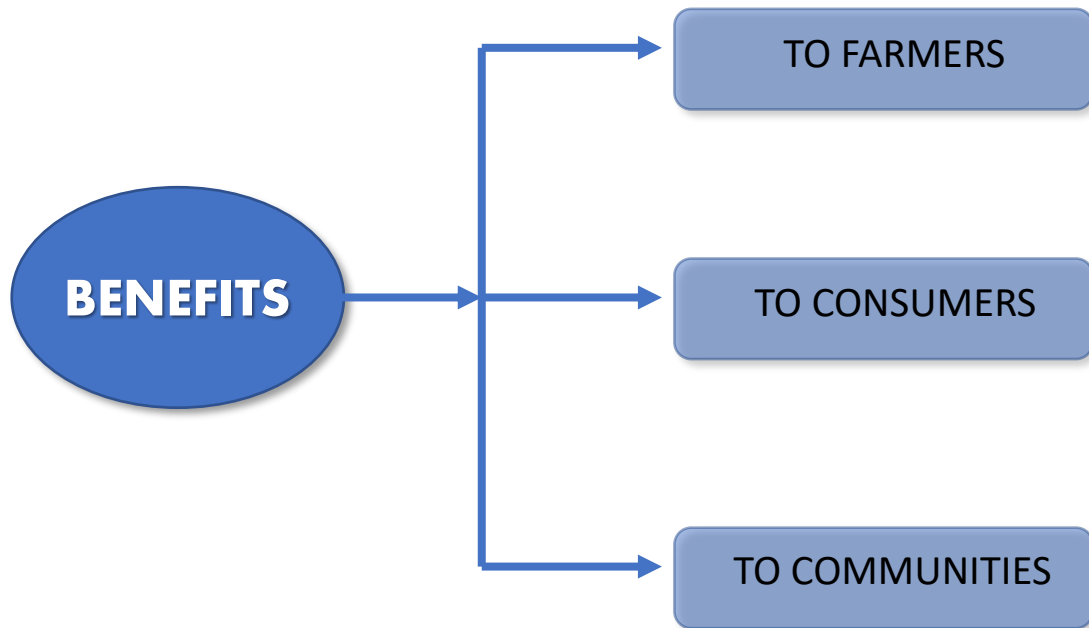


Figure 11: Illustration for Benefits of Farmer's Market

2.2.2.1. To Farmers

Compared to selling to wholesalers, food processors, or major grocery chains, farmers' markets can bring in a higher profit for farmers. Produce frequently requires less processing, transportation, refrigeration, and storage when sold directly to customers. Selling in an outdoor market also lowers or eliminates the cost of the land, structures, lights, and air conditioning. By selling the surplus to canneries and other food processing businesses, farmers can also keep the profit from the product that isn't sold to consumers. Farmers can keep the entire premium for a portion of their produce at the market rather than just the processor's wholesale price for the complete lot. Some farmers choose selling directly to consumers because it is straightforward, quick, transparent, and independent. The advocacy group Food Empowerment Project identified one strategy to help community-supported agricultural initiatives (CSAs). Consumers pay farms seasonally or monthly under this plan in exchange for weekly or biweekly produce delivery boxes. As an alternative, they might be forced to pay for the entire season's worth of produce up front. If there is a crop failure, consumers run the danger of losing their money in both scenarios. (Osmanski, 2020)

2.2.2.2. To Consumers

Farmers' markets support the preservation of vital social bonds by fostering beneficial interactions between residents of rural and urban areas as well as near neighbors. Businesses nearby benefit from the market's traffic. Purchasing food at the markets also promotes awareness of the neighborhood and goings-on. Farmers' markets and other outlets for "local" goods contribute to difference and individuality, which can boost pride and entice repeat visits. Communities may also profit from reduced transportation, storage, and refrigeration due to decreased infrastructure costs, reduced pollution, and reduced need for land for food storage.

Farmers' markets might enhance civic involvement by bridging the social gaps between urban and rural areas through creative distribution methods. Supporting independent growers can improve local economic possibilities and health & wellbeing in underdeveloped regions because there are fewer intermediaries involved. (Osmanski, 2020)

2.2.2.3. To Community

Parking, overhead driving, etc. are all decreased. Since the food is obtained directly from the farmers and not through a middleman, it is fresher and more readily available on the market. These markets also carry seasonal and healthy goods. Additionally, consumers receive a wider choice of commodities, such as organic foods, pasture-raised meats, free-range eggs and poultry, handcrafted farmstead cheeses, heirloom produce, heritage meat breeds, and numerous cultivars with fewer transport-immune traits that are disliked by big-box supermarkets. The market might serve as a meeting spot to converse with the neighbors. Most significantly, it can serve as a location where you can take a walk outside while getting the groceries you need. Additionally, because the production process is more condensed at farmers' markets, there are fewer intermediaries and fewer miles to travel than there are at supermarkets, which results in cheaper total prices. (Osmanski, 2020)

2.2.3. Realms of Farmers' Market

Farmers' market social meanings are integrated into the built environment through a mix of policy, program, planning, design, and administration. For better understanding the ecology of farmer's markets and their greater landscape the four realms of farmer's market have been studied. (Francis & Griffith, 2011). There are four physical realms of the market place—the promenade, the working market, the market landscape, and the market neighborhood— as a conceptual framework to better understand the ecology of markets and their larger landscape.

The physical realms of a farmer's market can be broken down into four main concepts: the promenade, working market, market landscape, and market neighborhood. The promenade is the public area where visitors can browse and socialize, featuring open-air stalls, seating areas, and live entertainment. The working market is the behind-the-scenes area where vendors prepare their goods for sale. The market landscape encompasses the physical environment of the market, including layout, architecture, and design. Lastly, the market neighborhood refers to the surrounding community where the market is located, including local businesses and residences that may interact with the market. Each of these concepts plays an important role in shaping the character and success of a farmer's market,

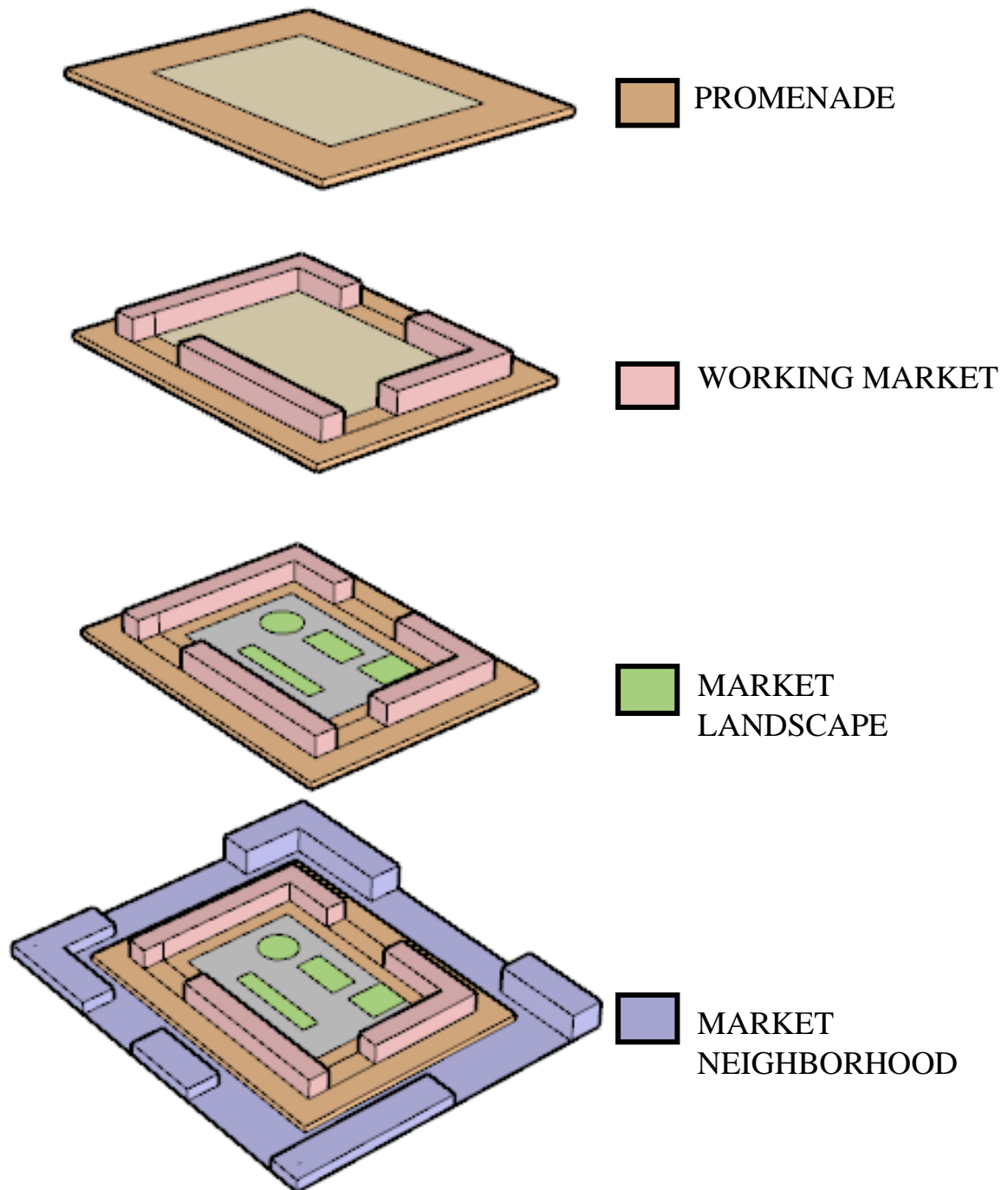


Figure 12: Illustration for Realms of Farmer's Market

2.2.3.1. The Promenade

A market's promenade, which serves as the main thoroughfare and gathering place for customers and tourists, is an essential component. From the entrances to the market center, there is a pedestrian flow pattern that may or may not be hierarchical. The promenade, which serves as the main circulation path, often ranges in width from 12 to 40 feet and is bordered on both sides by vibrant displays of merchandise that have been piled onto tables. A more intimate promenade usually has narrower aisles to encourage social interaction where individuals can bump into one another and greet their neighbors. Comparative shopping, where customers can view both sides of the aisle, is another benefit of narrower aisles. When the width exceeds a certain point, the promenade may lose its linear quality and start to resemble a plaza more than a promenade. The essential spatial quality of the market is established by the promenade's orientation. The following alphabetic shapes represent the different geometries that the promenade's linear quality can be adjusted into: the linear "I," the angled "L," the looping "O," and the gridded "E" and "B." A practice used in the design of retail facilities, repeated patron cycling across the market is preferred by some market managers. Regardless of design, most promenades have a start and finish as well as an entry and exit sequence that are distinguished by quiet transitions or official gateways. The promenade plays a crucial social purpose as the market's main social space in addition to being the circulation area. The promenade is where strangers congregate in a public area. The promenade's sequential nature is enhanced by repetitive landscape elements including pedestrian lights, tree plantings, and outdoor furniture, which punctuate the key moments along the way. This chain of events is also influenced by the paving patterns. (Francis, 2011)



Figure 13: Promenade Marketplace

Source: <https://101thingshiltonhead.com/75-shop-a-farmers-market/>

2.2.3.2. The Working Market

Farmers' market practical issues are reflected in the realm of the working market, which includes a variety of vending places and backstage areas. The most popular layout for a farmers' market's vending space is a 10'X10' grid of vending plots placed around the main circulation pattern. A 'backstage' facility for loading and unloading is located behind these exhibits.

Vendor parking, as well as access to electricity and water, are critical components of a well-functioning market. Customer overflow parking is an important issue for any market, but it does not have to be located within the market space. Storage for seats, tables, and benches, as well as signage pertaining to public health requirements and general market information, are all available in the working market. Public bathrooms, information kiosks, garbage, composting, and recycling programs, as well as bicycle parking, are all functional parts of the labor market. (Francis, 2011)



Figure 14 : The Working Market

Source: <https://www.pinterest.com/pin/197243658665702641/>

2.2.3.3. The Market Landscape

The market landscape is made up of open area adjacent to the functioning market and the promenade, and it offers extra leisure and relaxation possibilities that aren't necessarily linked with buying and selling. Markets that are successful usually provide a range of comfortable locations for people to rest while still participating actively in public life. A successful market landscape provides benches, mobile chairs, and other seating options in the form of steps, seat walls, and lawn areas, similar to the architectural ideas associated with effective urban places. By integrating children's play spaces, thematic gardens, and other landscape features, the market landscape transforms the market into a bigger public landscape. (Francis, 2011)



Figure 15: The Market Landscape

Source: <https://studiokda.com/project/marin-farmers-market/>

2.2.3.4. The Market Neighborhood

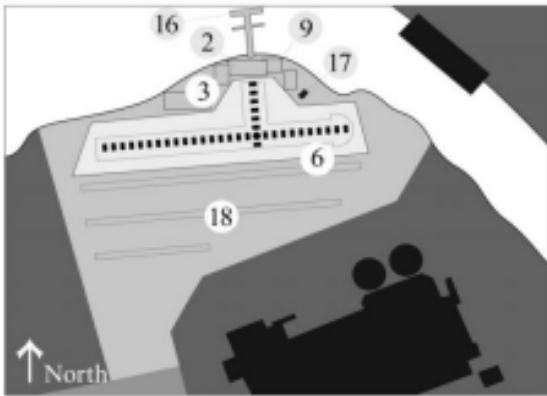
The greater urban setting or neighborhood is another physical area of the market place. By incorporating community groups and their culture into the market's planning, design, and operation, successful markets adapt to the surrounding neighborhood in their planning, design, and operation. In certain situations, well-planned pedestrian walkways, cycling paths, and open space networks connect surrounding civic institutions and retail operations to the market. Regional transportation infrastructure, public transportation, overflow parking, and other essential characteristics of the regional terrain are all factors to consider while planning a market. (Francis, 2011)



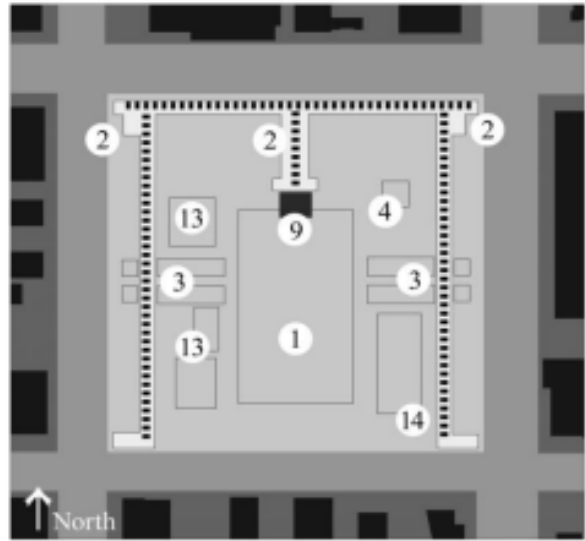
Figure 16: The Market Neighborhood

Source: <https://pin.it/117OicF>

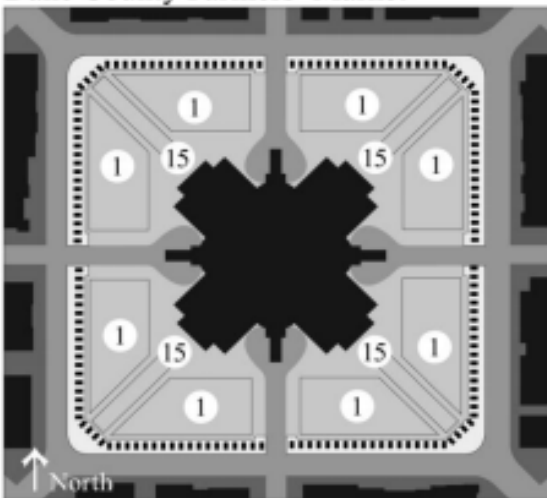
Ithaca Farmers' Market



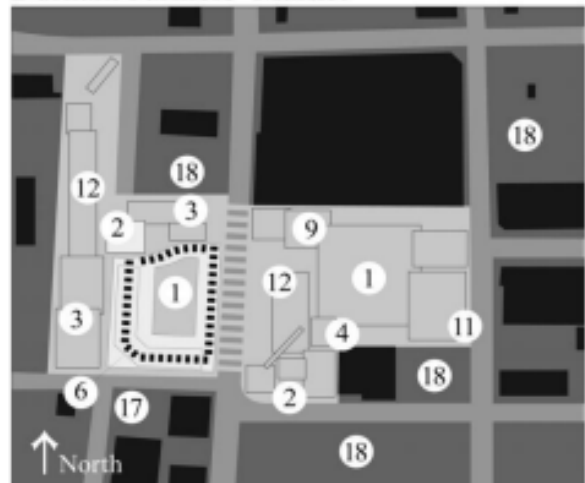
Downtown Farmers' Market



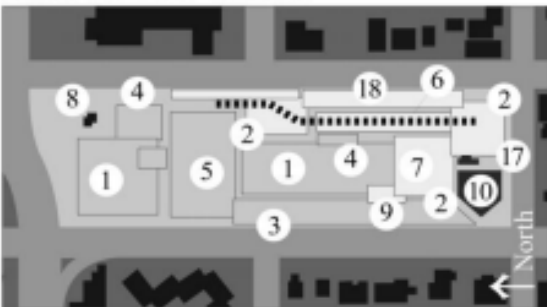
Dane County Farmers' Market



Durham Farmers' Market



Davis Farmers' Market



Legend

- | | | | |
|---------------------|-------------|---------------------|----------------------|
| Promenade | 1 Lawn | 7 Fountain | 13 Active Recreation |
| Working Market | 2 Plaza | 8 Restrooms | 14 Dog Area |
| Market Landscape | 3 Garden | 9 Performance Space | 15 Capital Pathway |
| Market Neighborhood | 4 Play Area | 10 Teen Center | 16 Harbor |
| Street | 5 Grove | 11 Skate Park | 17 Storage |
| Building | 6 Pavilion | 12 Nature Trail | 18 Parking |

Figure 17: Market Realms depicted by Francis and Griffith

Source: (Francis, 2011)

2.3. Place Making

“It takes a place to create a community and a community to create a place”

-William White Holly

The terms space and place are often used interchangeably, but they can mean different things depending on the context in which they are used. Placemaking shows that the creation of places transcends the material dimension and involves aspects such as sociability, uses, activities, access, connections, comfort, and image, to create bonds between people and a sense of place.

Placemaking means creating places and focuses on transforming public spaces to strengthen the connections between people and these places. Placemaking is a process centered on people and their needs, aspirations, desires, and visions, which relies strongly on community participation. (Moreira, 2021)

Placemaking encourages people to collectively envision and remake public places as the core of every community as both a general concept and a practical method for enhancing a neighborhood, city, or region. Placemaking refers to a collaborative process by which we can alter our public space to maximize shared value, strengthening the bond between people and the places they share. Placemaking encourages innovative patterns of use, focusing particularly on the physical, cultural, and social identities that characterize a place and promote its continual evolution. It goes beyond simply advocating improved urban architecture. (PPS, What Is Placemaking?, 2007)

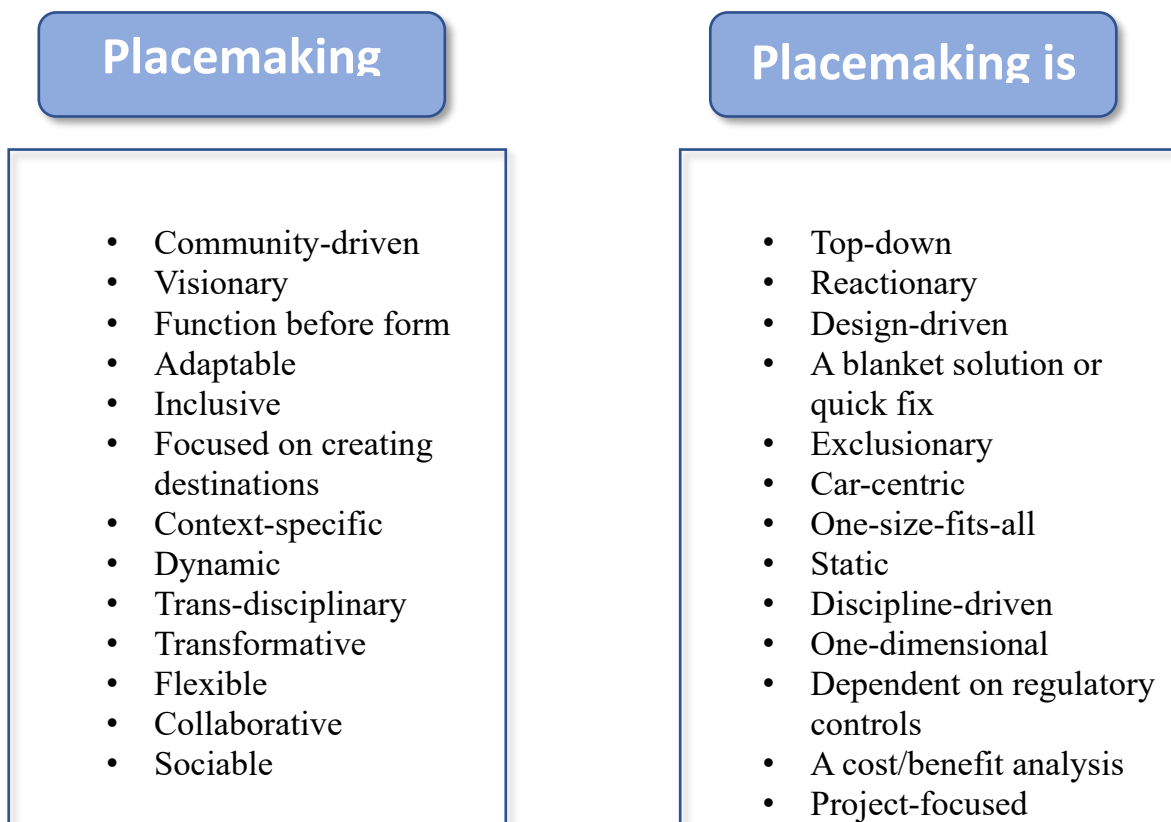


Figure 18: Placemaking concept

Source: (PPS, What Is Placemaking?, 2007)

2.3.1. Key Principles for Placemaking

Effective public spaces are extremely difficult to accomplish because their complexity is rarely understood. As William (Holly) Whyte said, "It's hard to design a space that will not attract people. What is remarkable is how often this has been accomplished." . (PPS, What Is Placemaking?, 2007)

PPS has identified 11 key principles for transforming public spaces into vibrant community places, whether they are parks, plazas, public squares, streets, sidewalks, or the myriad other outdoor and indoor spaces that have public uses in common. These principles are:

1. The community is the expert
2. Create a place, not a design
3. Look for partners
4. They always say, "It can't be done."
5. You can see a lot just by observing
6. Have a vision
7. Form supports function
8. Triangulate
9. Experiment: Lighter, Quicker, Cheaper
10. Money is not the issue
11. You are never finished

2.3.2. Placemaking Attributes

Project for Public Areas has assessed more than 1,000 public spaces over the past 30 years and has formally looked into tens of thousands more. We have learned from all of this that the majority of wonderful places—whether a huge urban plaza or a modest neighborhood park—share four essential qualities: (PPS, What Makes a Place Great, 2005)

1. It is easily reachable and well-connected to other significant locations nearby.
2. The area is welcoming and presents a positive image.
3. There is a draw for people to take part in the activities.
4. People enjoy hanging out there and frequent it frequently because it is a social location.

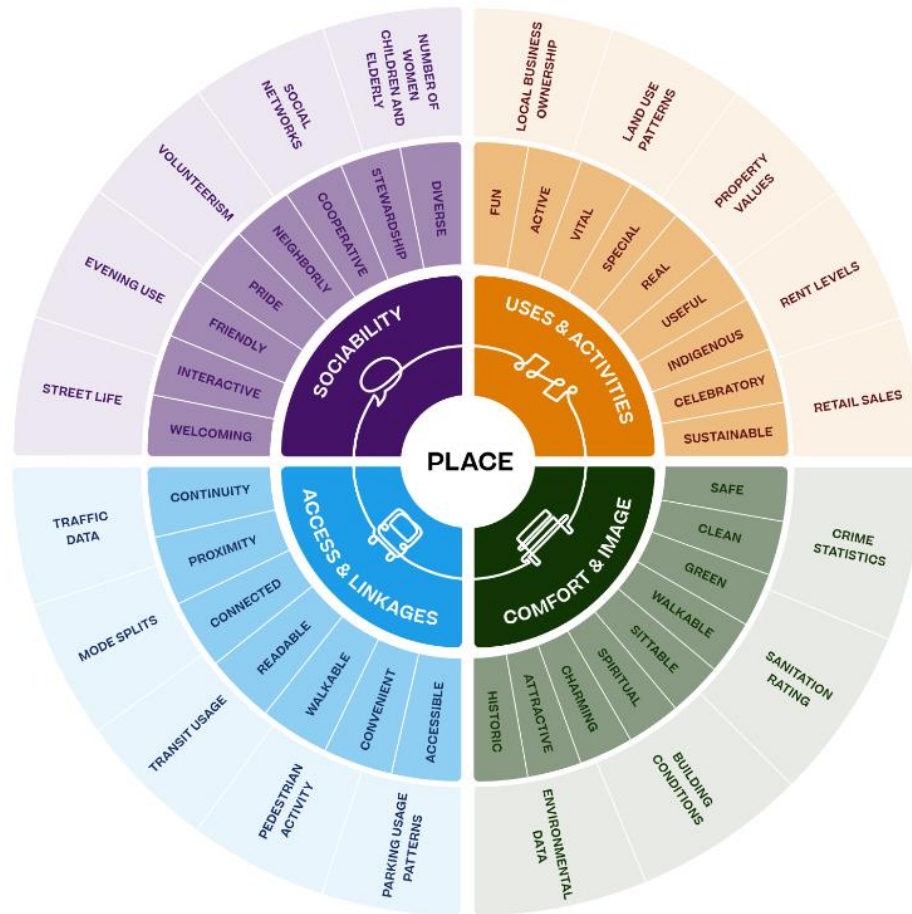


Figure 19: Illustration for Attributes of Good Public Place

Source: PPS, *What Makes a Place Great*, 2005)

2.3.2.1. Access and Linkage

It is simple to assess a location's accessibility by noting its connections to the neighborhood, especially any visual connections. A wonderful public area is simple to find, simple to enter, and simple to move around it. The layout makes it possible for you to see the majority of what is happening there both up close and from a distance. A public area's borders are crucial in determining how accessible it is. For example, a row of stores along a roadway is more fascinating and often safer to walk along than an empty lot or a wall. Accessible spaces have high parking turnover and are easily reached on foot or, ideally, by public transportation. An accessible location is more likely to be frequented, which guarantees successful placemaking.



Figure 20: Access and Linkage

Source: <https://www.pps.org/places/pioneer-courthouse-square>

2.3.2.2. Comfort and Image

A space that feels cozy and appears welcoming is more likely to succeed. A sense of comfort includes perceptions about safety, cleanliness, and the availability of places to sit. Surprisingly, the lack of seats is the downfall of many otherwise excellent locations. People are drawn to locations that offer them a variety of spots to meet and hang out, sit and think, and be in or out of the sun at different times of the day or year.



Figure 21: Comfort and Image

Source: <https://www.pps.org/places/pioneer-courthouse-square>

2.3.2.3. Usage and Activities

A magnificent place is built on a foundation of diversity of activities. People have a purpose to visit (and go back to) an area if there is something to do there. A place will be empty if there is nothing interesting to do there. The best indicator that anything is off is that. A location will attract a variety of visitors at various times of the day with the help of a carefully designed range of activities. Young children are drawn to playgrounds throughout the day, older children are drawn to basketball courts after school, and everyone is drawn to concerts in the evening.



Figure 22: Usage and Activities

Source: <https://www.pps.org/places/pioneer-courthouse-square>

2.3.2.4. Sociability

“What attracts people most, it would appear, is other people? “

- William Holly Whyte

What is the most crucial attribute for a location to possess? and the most challenging. You know you have a fantastic place when it becomes a preferred spot for people to meet up with friends, say hello to their neighbors, and feel at ease talking to total strangers.

(PPS, What Is Placemaking?, 2007)



Figure 23: Sociability

Source: <https://www.pps.org/places/pioneer-courthouse-square>

2.3.3. Public spaces

Public spaces are where people meet and interact; socialize and discover common passions; and where they affirm their shared rights to the city. In a people-centered city public space is central to the notion of a livable and human environment.

Public space is inherently multidimensional. Successful and genuine public spaces are used by many different people for many different purposes at many different times of the day and the year. Because public spaces harbor so many uses and users—or fail to do so—they are also where a staggering cross-section of local and global issues converge. Public space is for buying and selling, or for meeting, playing, and bumping into one another. Public space is for conveying our outrage and our highest aspirations, as well as for laying the most mundane utilities and infrastructure. And when we let it, public space can be a medium for creativity, expression, and experimentation. (“Public Spaces”, 2016)

2.3.4. Power of 10+

To be successful, cities need destinations. They need destinations that give an identity and image to their communities, and that help attract new residents, businesses, and investment. But they also need strong community destinations that attract people. A destination might be a downtown square, a main street, a waterfront, a park, or a museum. Cities of all sizes should have at least 10 destinations where people want to be. What makes each destination successful is that it has multiple places within it. For example, a square need at least 10 places: a café, a children’s play area, a place to read the paper or drink a cup of coffee, a place to also sit, somewhere to meet friends, etc. Within each of the places, there should be at least 10 things to do. Cumulatively, these activities, places and destinations are what make a great city. We call this big idea the “Power of 10+.” (Project for Public Spaces, 2016)

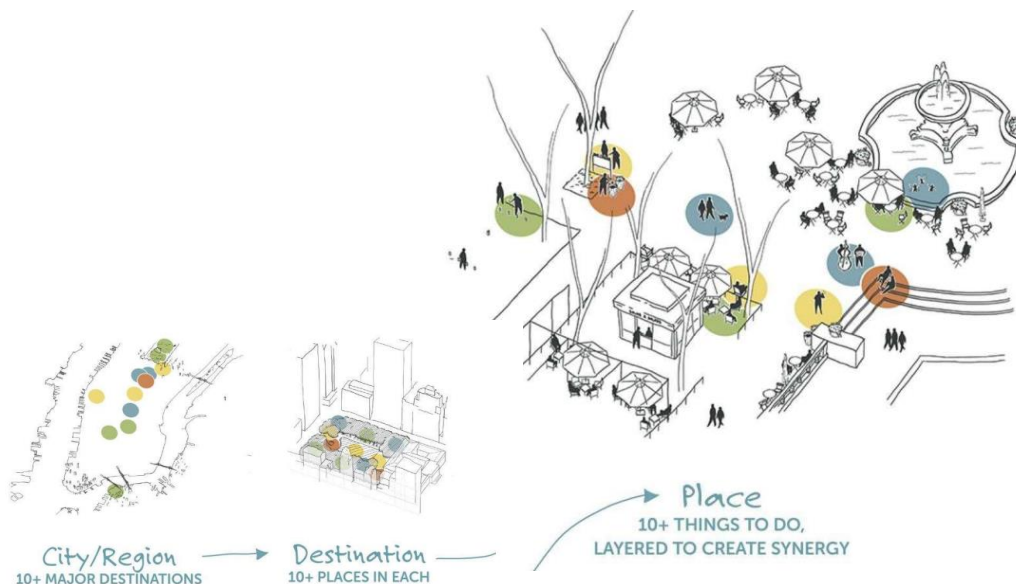


Figure 24: Power of 10+

Source: (“Public Spaces”)

2.4. Market as a Public Space

Markets are the space which fulfills the daily needs of users from ancient times. The socio-economic condition of society depends on market success. But, today the definition of market is changed; it provides daily needs as well as space for recreation & socializing. (Making Your Market a Dynamic Community Place, 2022)



Figure 25: Visual Accessibility Illustration

” What attracts people most, it would appear is other people”

-Holly Whyte

Public markets are not just placing of commerce. What sets public markets aside from other retail locations is that they operate in public space, serve locally owned & operated businesses, and have public goals. This focus on the public good is what makes successful markets grow and connect urban and rural economies. They encourage community and economic development by keeping money in the local neighborhood. Public markets also offer low-risk business opportunities for vendors, often from vulnerable populations, and depending on the type of public market, they feed money back into the rural economy where farmers grow, raise, and produce their products.



Figure 26: Benefits of Public Markets

Source: (“Public Spaces” 2016)

The spin-off benefits of public markets are numerous. From increasing access to fresh, healthy food to providing important revenue streams, markets positively impact local businesses, governments, and residents. But perhaps most importantly, public markets serve as public gathering places for people from different ethnic, cultural, and socioeconomic communities—markets are our neighborhoods’ original civic centers.

2.4.1. Placemaking Strategies for Markets

To enhance the place-making strategies for markets, it is important to create a sense of place through reflecting local culture and history in design elements, as well as enhancing walkability by creating pedestrian-friendly streets and sidewalks. Providing comfortable seating areas and shaded spots can encourage people to stay longer and enjoy the market, while offering a variety of products through a diverse mix of vendors can attract a wider range of visitors.

2.4.1.1. Select the Right Location

Historically, markets have always been in or near the center of town and there is still a need for that today. The location, visibility and accessibility of a market are very important to its success. Most market customers do not typically travel (walk, bike, drive, transit) more than 15 minutes to visit it, and travel even less for small markets so locating in or near a place that is convenient to a lot of people is best. Ideally your market site will be:

- In a high-traffic location, easy to walk and bike to, have good transit access and plenty of parking.
- A site with existing activity – and the space and potential for more – whether a park or small plaza and/or a site that is adjacent to a busy bus stop, community institution or retail shopping area is often a great place to locate a market. This enables the market to become a key element of a multi-use destination where other activities already take place or could take place.
- A location with a strong sense of place already is ideal, however in some cases, a market can help create that place. (Project for Public Spaces, 2016)

2.4.1.2. Design the Market as a public Space

The figure explains how the functions can be arranged so that the space itself encourages public interaction and circulation creating a livelier and more vibrant ambience. As shown in a simple arrangement of spaces from linear to slightly altered space to create nodes between the functions has automatically increased the vibrancy of the space.

While the primary function of a market may be commerce, the busiest, most successful markets are places where people want to spend time together. A market is a place for meeting and catching up with neighbors, accessing services, and becoming part of the daily life of a community. Through programming, layout, and amenities, markets can provide many opportunities for visitors to enjoy themselves. In addition to shopping, sitting, and eating, the market's layout should include spaces for performances, play or even learning that will give people multiple reasons to return to your market. Comfortable places to sit will foster a dynamic hub of activity and allow people to spend time people watching, which is a favorite activity at markets. Moveable tables, chairs and umbrellas along with a food cart are a common LQC market addition.

Strengthen connectivity to existing destinations near the market space and extend programming and activation into the space, i.e., playgrounds, sports fields, a shed, a café, library, etc. (Project for Public Spaces, 2016)

2.4.1.3. Promote the Market as A Community Destination

To attract people to your market and reinforce it as a community destination you need to develop and maintain a strong promotions strategy. Most markets do not have large promotional/advertising budgets, and some don't have a budget at all, but fortunately markets are full of good news and unlimited programs and events that help drive customers to a market – many of which are free such as samples, music and space for dancing, board games, etc.

Develop a strong social media presence, including Twitter, Facebook and Instagram, and good connections with local press. Program the market every day with a demonstration of how a market product can be used or made, live music, kid's events, etc. You won't know what the best special event or activity for your market is until you try it out so experiment and see what people like. Create simple, clear marketing materials such as signs, banners, a-frames and fliers. Customers only care about when the market is open, where it is located, what they can buy and what they can do there. (Project for Public Spaces, 2016)

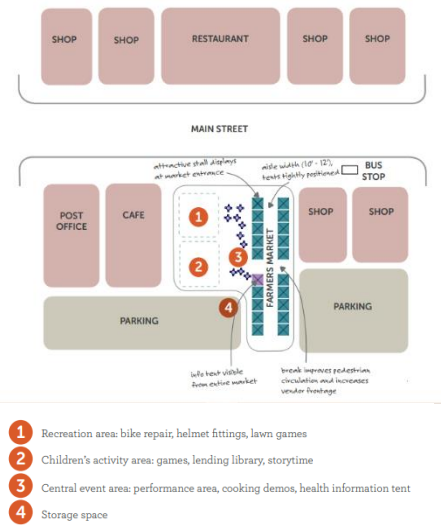


Figure 27: Sample Market Layout

Source:

<https://www.pps.org/product/making-your-market-a-dynamic-community-place>

2.4.1.4. Make the Market Inclusive

A great market makes visitors feel like they are experiencing something special. Your market should be a place where neighbors can be proud of their history, culture, people, and community. Over time, residents should understand that their market space is unique to their town because of the types of food and merchandise that is for sale, the types of music that is played, the types of special events that are held there and who is hosting them. Communities across the U.S. are becoming increasingly diverse, and markets have an opportunity to reflect that diversity and become spaces of inclusion by increasing market access for low and moderate income and non-English speaking individuals and families. This may not be something that happens automatically, so markets may need to take some specific steps to make all people feel comfortable and welcome.

- Focus your promotional materials on what makes your market unique – highlight vendors and products that can only be found in your community and promote that this market is of, for and by the community.
- Invite a diverse array of talent from the community and highlight local culture, including musicians and local cooks to share their talents at the market.
- Provide products and recruit new growers and vendors to more accurately reflect the demographics of the community. (Project for Public Spaces, 2016)

2.4.2. Activities in Isolated Vs Triangulated Space

“Triangulation is the process by which some external stimulus provides a linkage between people and prompts strangers to talk to other strangers as if they knew each other.”

- Holly Whyte

In a public space, the choice and arrangement of different elements in relation to each other can put the triangulation process in motion (or not). Through clever design we can create a whole that is a lot greater than the sum of its parts. Triangulation, when applied to the design of space, means to place items in such a way that the use of one increase due to use of the others. For example, if a bench, a wastebasket and a telephone are placed with no connection to each other, each may receive a very limited use, but when they are arranged together along with other amenities such as a coffee cart, they will naturally bring people together (or triangulate!). On a broader level, if a children’s reading room in a new library is located so that it is next to a children’s playground in a park and a food kiosk is added, more activity will occur than if these facilities were located separately (PPS, 2007). Markets when combined open public spaces and other amenities can be catalyst in creation of vibrant precinct. The degradation of open spaces in the urban fabric can be tackled using the concept of triangulation as the open spaces when triangulated with public infrastructures like markets, it can promote creation of public promenades with ease as the spaces become activated through active participation of people and are also economical in long run. (PPS, 2007).

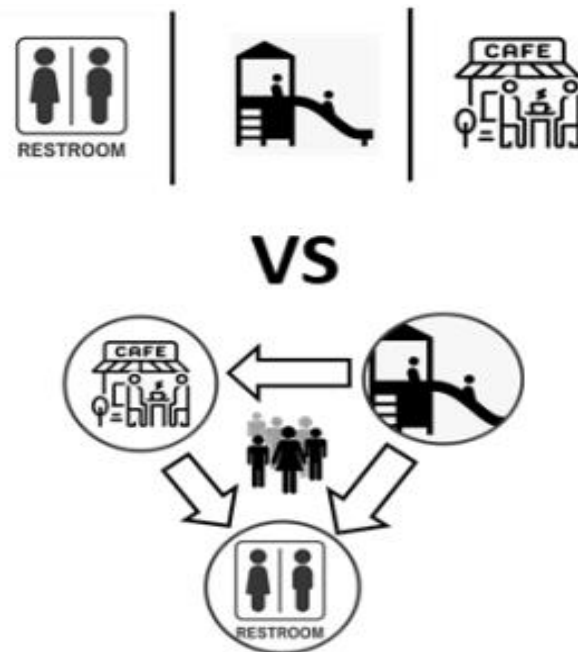


Figure 28: Activities in Isolated spaces vs Triangulated Spaces

2.5. Design Principles for Farmers' Market as Public Space

The following are the design principles that will allow marketplaces to function as public spaces:

1. **Permanency of Design**
2. **Flexibility**
3. **Wholeness**
4. **Social Life**

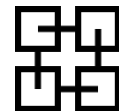
By highlighting numerous key process-related phenomena, these principles enhance the spatiality of the market realms and are essential to the establishment of long-lasting, socially engaged farmers' markets in public spaces. While not intended to be exhaustive or exclusive, these guidelines can be used as a guide when developing farmers markets as public spaces. It's crucial to consider local circumstances, culture, and the organizational requirements of each market while applying these ideas. (Francis, 2011)

2.5.1. Permanency of Design



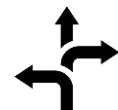
An underlying principle for the long-term survival of farmers' markets is the permanence of program through the architecture of public space. The market's permanence can be established through design using landscape elements such entry structures, bandstands, gazebos, fountains, market pavilions, mature tree groves, socially engaging plazas, pedestrian-scaled lighting, and thematic gardens. Farmers' markets continue to be programmatic occurrences in public space without the permanence of design, vulnerable to being replaced by other uses. (Francis, 2011)

2.5.2. Flexibility



While design permanence is crucial, the design also needs to be flexible. A resilient market structure must be flexible and hospitable. Any effective design and management process must consider that the market is a dynamic activity. The layout should be compatible with the local climate and enable the market to adjust to seasonal changes and fluctuations in consumer demand. The market environment should adapt as the needs of the market do. The five case studies all still represent and continue to change with the market community. Long-lasting successful marketplaces are also characterized by ongoing analysis and redesign. Design can become rigid and outmoded without flexibility. (Francis, 2011)

2.5.3. Wholeness



Most markets have a quality of being in place that is whole or focused. Usually, they have an interior market area that is both distinct from and representative of the surrounding urban context; the market landscape connects to and supports the market neighborhood. An essential spatial factor in the fulfillment of this centeredness is the patterning of the working market realm along the edges of the market landscape. The market's efficiency can also emphasize the park's or open space's unity, improving the neighborhood's prospects while highlighting its importance as a public gathering place. To create a market that is entire and centered, a participatory design approach is necessary, and it should involve neighboring communities in

the identification of design ideals to be incorporated into the market's design program. (Francis, 2011)

2.5.4. Social Life



Markets that are successful encourage social interaction and support a variety of social meanings. Supporting socialization should receive special design consideration. The sedentary places of reflection should be integrated with the spaces for mobility and social interaction, as well as the interaction between the promenade and the market environment. People should be encouraged to appreciate the market as a more impromptu public space by providing social spaces where they don't feel pressured to buy stuff. For social contact, adequate permanent and moveable seating is essential. To ensure an inclusive social space, a variety of ages, genders, and cultural backgrounds should be taken into consideration. The design must take children's play and activity into consideration. The social life of the area will be further improved and given new layers of existence by social programs in addition to the market function. Again, achieving this goal might be facilitated through a participatory design approach. (Francis, 2011)

2.6. Inference

From the literature review considering the 4 realms of market i.e. Promenade, Working Market, Market Landscape, Market Neighborhood and 4 place-making attributes i.e. Access and Linkage, Uses and Activities, Comfort and images, Sociability the inferences can be drawn as:

Table 1: Inferences from Literature Review

Market Realms	Elements
Promenade	Circulation corridor, circulation patterns, configuration
Working Market	Vending pavilions and spaces, furniture, loading and unloading areas, public restrooms, informational kiosks, waste management, parking, recreational spaces.
Market Landscape	Benches, outdoor Amphitheatre, thematic gardens, sat walls and other landscape features
Market Neighborhood	Urban context, regional transportation system, public transit, overflow parking, Inclusiveness
Attributes of Public Space	
Attributes	Indicators
Accessibility & linkages	Proximity, walkability, accessibility, visibility
Uses and activities	Multiplicity of activities; shopping, recreation, food, relaxation, children play area,
Comfort and Image	Greenery, Water bodies, Pavilions, seating, historicity, attractive, aesthetic character, landscape furniture
Sociability	Opportunities for interaction; gathering places, interactivity, Street Life, Evening Use, triangulation, diversity and permeability

2.7. Design Specifications for Farmer's Market

The farmers market designs are different from other buildings. They put special emphasis on the planning layout, architectural layout, inside building environment, future building transformation models, and thorough evaluation after use. Farmers markets require careful planning and research of the internal building ventilation systems

The farmer's market is a neighborhood, a working market, and a promenade. Farmer's market architects face obstacles in creating buildings that are both affordable and user-friendly. It must strike a balance between various needs, cost, sustainability, and eco-friendliness. Popular in the design of green buildings are integrated architectural plans made with the aid of engineering research. Architectural designers created the structure and the vendor stalls that house the food and other items for this farmers market.

It is crucial to have eco-friendly booths that are simple to use for farmers markets. It is important to assist vendors in displaying and showing off their goods.

Furthermore, these design specifications can be taken into considerations

- An intimate scale and a festive character.
- A critical mass and diversity of vendors to ensure that first time visitors found what they were looking for.
- A restaurant and places to sit
- Vendors placed close together would create a lively density and encourage chance encounters
- A memorable, moveable, yet large Main Street gateway to close off the street, promote the event, and safely block vehicular traffic
- For areas, storage, administration, specialized far circulation, and especially parking, adequate space availability is crucial:
- This space allocation should ideally provide for future expansion needs as well as flexibility in market space utilization to meet management needs and adjust to shifting social and economic conditions:
- Additionally, the most flexibility possible for change should be built into building designs: Emphasis should be placed on the use of low-cost covering of sales areas, whether through the use of permanent light-weight shade structures or retractable blinds, at peak times and for simple rural and urban retail markets:
- Different floor/road levels should be avoided whenever possible in building designs. (architecture, n.d.)

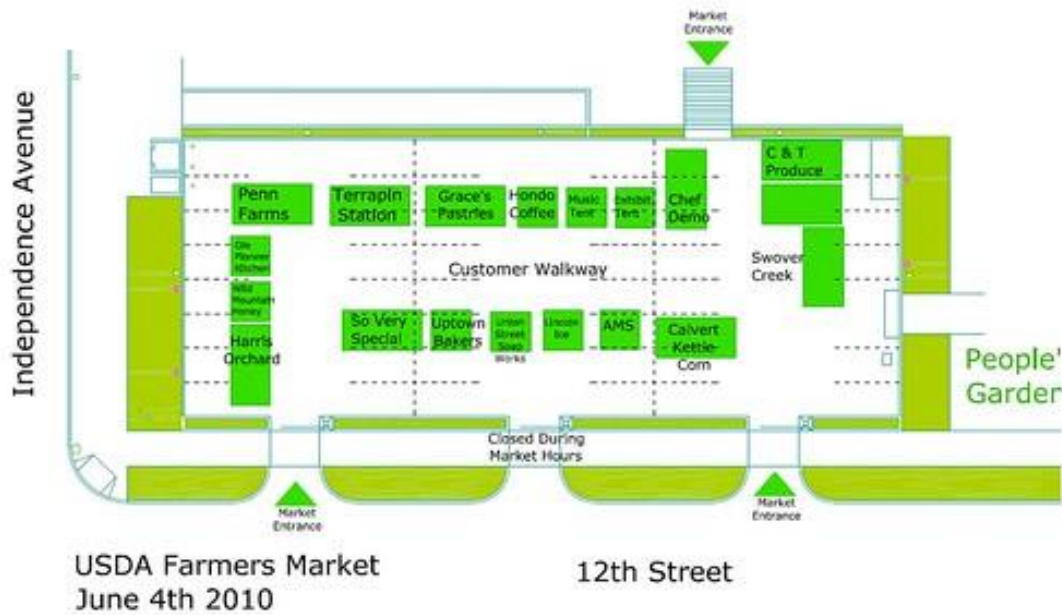


Figure 29: Architect Fidel Delgado's layout of the USDA Farmers Market

Source: (Delgado, 2017)

2.7.1. Market Infrastructure

Market Infrastructure plays a significant role for the proper functioning of the market. Market infrastructures should be thoroughly planned ahead of time. This includes determining if the location is adequate for the correct operation of the market, market layouts that would be appropriate for the site, and ideas for space utilization.

2.7.1.1. Site Location

For urban wholesale market its location is the major factor for its success. The location is strongly guided by the transportation system of the place, modes of transportation and transit stops. The preferred location for markets is usually with good access to major road system, along with compatible land uses (such as catering and agri-business industries). Urban retail markets must be convenient for customers, usually within walking distance of the neighborhood. However, these location requirements need to be checked against other factors such as suitability of site in terms of its cost, present ownership, size, suitability for construction and availability of services. The optimum site location is very crucial, as it will reduce financial costs of transportation for both buyers and sellers, lowering costs of the produces. This reduced cost will facilitate energy savings and reduce environmental pollution. (Delgado, 2017)

2.7.1.2. Internal Traffic Flows and Congestion

Traffic congestion usually occurs when access to the market is limited to only one operating entry and exit; which is usually favored by the market authority to control entry for maximizing revenues, as entry gates are used as check points for revenue generation. The congestion is further intensified if the lead-in length of the internal access road is very short and vehicular

activity (parking, loading and unloading activities) within the site is not rigorously controlled. However, congestion can be controlled if road patterns are regulated in one-way system and the market trading hours are extended or changed. But, still it will depend upon the controlling of internal vehicular activities, with effective traffic management. (Delgado, 2017)

2.7.1.3. Market Lay-out

The efficiency and the success of any market is greatly influenced by its physical layout. The market lay-out needs to achieve: an unobstructed traffic circulation pattern and effective parking control with adequate parking facilities being provided; maximum possibility for interaction between the market users leading to the possibility of optimum price formation; provision and full utilization of support facilities; adequate arrangements for display and sale of produce to maintain produce quality; and efficient produce handling. (Delgado, 2017)

The basic module from which the design of any market is based is the individual market stall. The typical fixed stalls for a covered market, the difference in design in the illustration reflecting the slightly different needs for the sale of fruit as opposed to vegetables. The sale of flowers would need a different arrangement, requiring fully tiered shelving and probably omitting the sales counter, whilst for grains and spices space would be needed for the stacking of sacks at the rear of the stall and for the display of samples of the product in trays at the front of the stall. Basic layouts of stall based on level of pedestrian control are as follows:

- Semi-controlled booth arrangement

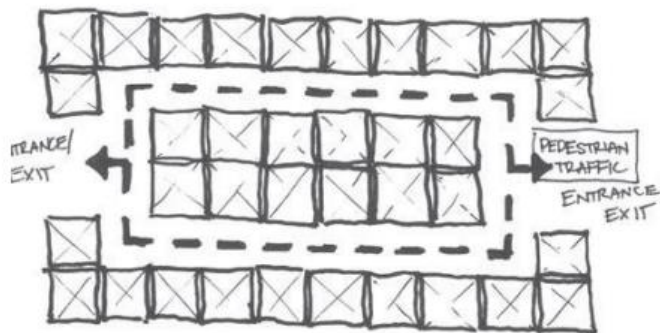


Figure 30: Market Layout (i)

- No control Booth Arrangement

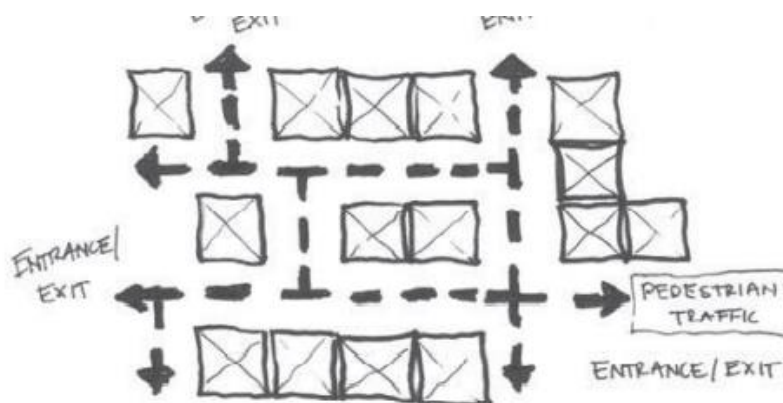


Figure 31: Market Layout (ii)

- Controlled Booth arrangement

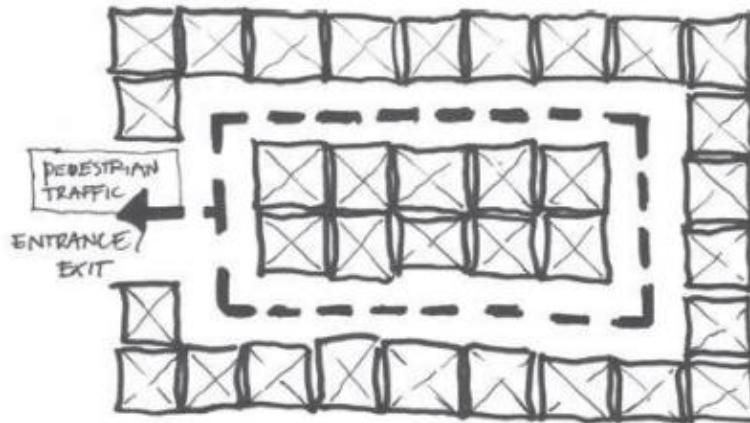


Figure 32: Market Layout (iii)

- Little Controlled Booth Arrangement

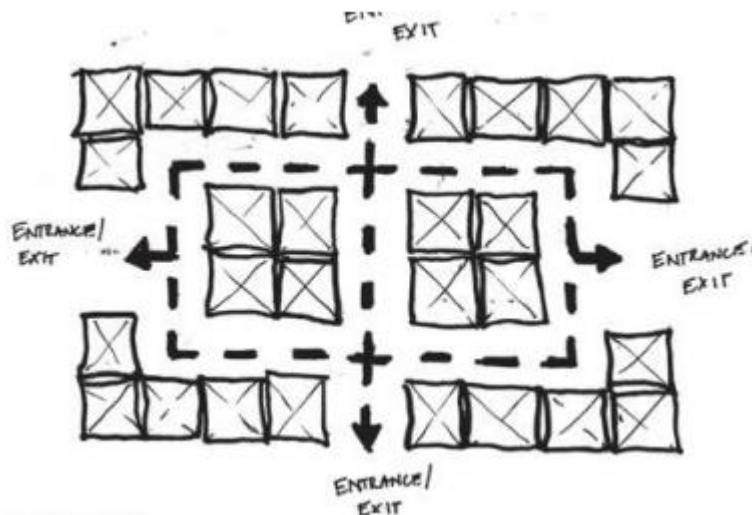


Figure 33: Market Layout (iv)

2.7.1.4. Space Utilization in Markets:

Lay-out of market should be such that optimum space utilization can be achieved, which is one of the keys to success. The major decision is to determine the “core” space of the market; i.e. space where sales occur. This space includes both the area occupied by the traders and local circulation area needed for convenient flow. The area can be totally indoors or combination of covered space (stalls) facilitated by external gangways or access platforms. General space requirements for a market can be obtained as follows:

- 2 to 4 square meters per trader in small retail markets and, a space around 100 square meters per trader for wholesale market can be taken.
- Administrative office space shall be 10 to 15 square meters per office worker.
- Tentative space for cleaner’s store and guardhouse can be around 10 square meters for small market and 20 to 30 square meters for a larger market.

- Private toilet space of 2 square meters per 25 market employees (separating male and female) may be provided.
- Public toilet space of 2 square meters per 1,000 peak period market users (separating male and female) may be provided.
- Space for specialized uses should also be considered including auction slab, fruits ripening rooms and public cold stores.
- Requirements of ancillary space should also be considered (i.e. banks, catering facilities, sales outlet for packaging materials etc.)

Total of these figures is termed as net usable space, however further allowance of 10 percent should be added for general pedestrian circulation, such as main walkways; and the obtained area is total usable space. Normally, 5 percent further allowance should be made to total usable space, considering the area that building structure and infill wall occupies; depending upon the irregularity of site up to 10 percent shall be added. The final total area obtained is termed as the gross market area, usually this space is considered as covered space. (Delgado, 2017)

2.7.1.5. Estimating overall supply, demand and consumption.

It is important to estimate the total supply, demand and consumption of any agricultural produce, in order to review the adequacy of existing facilities or projection of demand for new facilities. A typical method of estimation is explained in the box below (White, 1999)

Estimating overall supply, demand and consumption

Estimating the supply, demand and consumption of produce is the key step in reviewing the adequacy of the existing facilities and projecting the demand for new facilities. The following steps need to be followed:

1. Define the population served by the market system, including the immediate population (urban or rural) and that of adjacent areas forming part of the catchment zone of the market.
2. Define the annual average population growth of the catchment zone.
3. Estimate the overall supply of produce (usually defined in tons) using a "Food Balance" approach:
 - Total annual production, obtained from agricultural statistics and crop cutting trials;
 - Plus imports and existing stock/storage (where these are relevant, such as with a wholesale market);
 - Less waste and use for other purposes (e.g. seed) and future stock;
 - Less annual exports;
 - Balance available for consumption and processing;
 - Less processing;
 - Balance available for consumption;
 - Estimate for specified years the average per caput consumption of fresh fruit and vegetables (balance available for consumption divided by population - see 1 and 2 above); and
 - Estimate variations in consumption levels in different towns and regions (there is usually variation between urban and rural areas).

Figure 34: Estimating overall supply, demand and consumption

Source: (White, 1999)

Based upon this estimation of overall supply, demand and consumption total sales area required is determined, considering the economic aspects.

2.7.1.6. Site size

The total site area required to accommodate the given covered space area (including sales, utility, administration, and other amenities) should be in the ratio of between 1:4 and 1:3 but can be in the range of 1:5 to 1:2.5 depending upon the context. The overall site area required in square meters can thus be obtained by multiplication of the gross market area and factor of 2.5 to 5, allowing traffic circulation, parking and site landscaping. (Tracey-White, J. D., 1995)

2.7.2. Waste management / Bio gas

The handling of the solid trash is the farmer's market's key issue. Daily waste is produced, and the majority of it is dumped in an unmanageable manner. The biogas plant is one option for managing the waste generated by the farm. Because all market waste products are biodegradable, they can be combined to create compost manure, which can then be sold to farmers at a reasonable price. Nothing is wasted because the trash from the farm products can be recycled as compost manure and used by the farmers again.

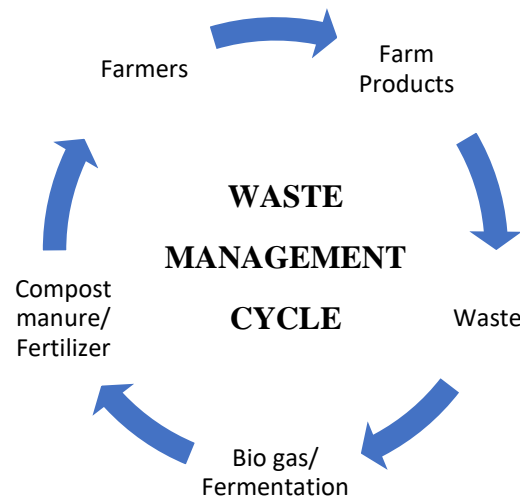


Figure 35: Illustration for Waste Management Cycle



Figure 36: Biogas Production

Source: <https://www.biomali.in/biogas.php>

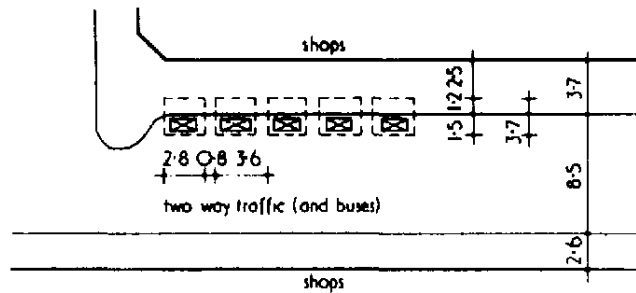
2.8. Typical Market Infrastructure Standards

Market Infrastructure Standard has been given considering the road width and sizes of pathways that helps in proper vehicular flow inside the market.

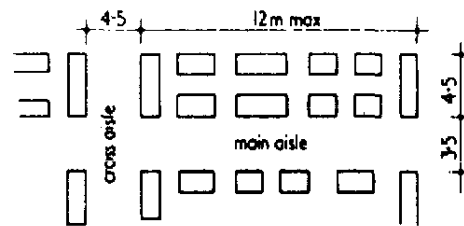
Table 2: Market Infrastructure Standards

S. No.	Description	General Dimension
1.	Single Lane Road (Width)	3.5m
2.	One-Way Road (Width)	7m
3.	Two-Way Road (Width)	12m
4.	Size of Car Parking (Area)	4.8m x 5.4m
5.	Visitors' Car Parking (Number)	2 - 5 spaces per 100 m ² of sale area
6.	Visitors' Car Parking (Distance)	preferred maximum distance from market: 100 metres (absolute maximum distance at peak periods 200 metres)
7.	Size of Pick-Up Parking (Area)	8m x 3.65m
8.	Size of Truck Parking (Area)	11m x 3.65m
9.	Parking for Traders and Delivery Vehicles (Number)	one or two per four stalls (in a highly motorized society: equal to the number of stalls)
10.	Sidewalk (Width)	2.5 metres minimum (5.2 metres if roadside stalls are to be accommodated)
11.	Water Supply Standpipes or Tube Wells (Distance) (Meat and Fish Stalls with Immediate Access to Water Supply (i.e. adjacent))	maximum distance of 50 metres from users (25 metres preferred)
12.	Latrines and Urinals (Distance)	maximum distance of 100 metres from users (50 metres preferred)
13.	Dustbins or Garbage Pits	maximum distance of 50 metres from users (25 metres preferred)
14.	Lamp Standards	spaced at an interval of 15 to 25 metres

Source: (Alder, 1991)



a Roadside



b Part of typical market square

Figure 37: Typical Road Widths and Street Market Stall Dimensions

Source: (Alder, 1991)

2.9. Marketing Channels

Agricultural products like fruits and vegetables are typically sold through a variety of marketing methods. Therefore, in order to perform any meaningful interventions in a marketing system, it is crucial to describe the different types of marketing channels, their connections, and their purposes. Farmers selling directly in markets, petty merchants, assemblers, wholesalers, semi wholesalers, commission agents, auctioneers, brokers, transporters, and retailers are just a few of the market intermediaries that help connect rural and urban markets. Following is a discussion of the various types of marketing channels through which these market intermediaries typically become active. (Tracey-White, J. D.,1995).

2.9.1. Rural Primary Markets

In this kind of distribution route, farmers get involved by selling modest amounts of produce directly to village traders, who then distribute it to rural consumers through shops. These marketplaces are a component of a commerce network and are often established at a central location in a hamlet on a regular basis. (Tracey-White, J. D.,1995).

2.9.2. Assembly Markets

These markets are larger in size than rural markets, where producers or traders trade larger quantities of produce. Typically, these assembly marketplaces are situated next to major thoroughfares or other traffic hubs. Typically, traders or collection agents purchase the produce on their own account or that of metropolitan wholesalers. (Tracey-White, J. D.,1995).

2.9.3. Wholesale Markets

Markets for terminal wholesale and semi-wholesale goods are found in or close to large cities (normally with population exceeding 0.5 million). These markets are mostly supplied by major farmers or by dealers, either directly from farms or from rural assembly facilities. Despite the fact that traders handle the majority of the transactions, several wholesale marketplaces have "farmer's markets," where farmers can sell directly to merchants. (Tracey-White, J. D.,1995).

2.9.4. Retail Markets

These markets are designed to cater to the needs of consumers who can be found in provincial, town, and city centers, as well as other major urban regions. These retail markets might also do semi-wholesale tasks, allowing for "farmer's markets," which are highly popular in developing nations. (Tracey-White, J. D.,1995).

2.9.5. Other Marketing Channels

On-farm sales, where collectors buy the produce (often under contracts between the producers and distributors), and transportation to wholesale outlets packing houses or supermarkets, are common methods other than markets, particularly in horticultural products.

The wholesale (permanent) vegetable market is the subject of the study, so it is important to comprehend the specifics of its market infrastructures. The analysis of wholesale market infrastructures considers a number of factors that influence market viability, planning, and design. (Tracey-White, J. D.,1995).

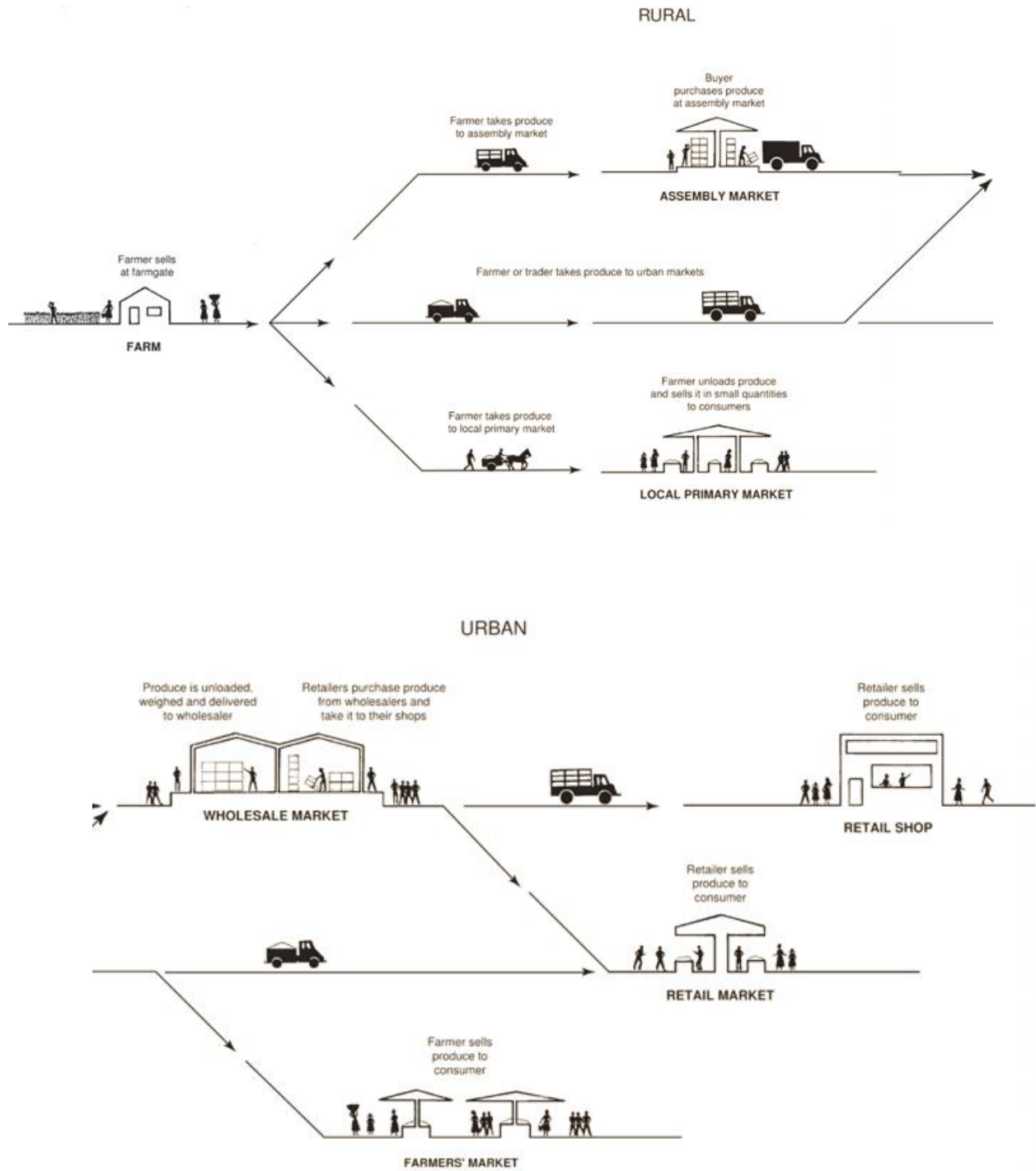


Figure 38: Marketing Channel

Source: Tracey-White, J. D. (1995).

2.10. Issues Related with Farmer's Market

1. Solid Waste Management
2. Environmental Pollution
3. Physical Aspects
4. Traffic Congestion
5. Management Issues
6. Macro level Planning

2.10.1. Solid Waste Management

Solid waste management seems to be one of the major issues of the permanent vegetable market following are its major issues and problems:

- Solid wastes are not properly cleaned from the market stalls, access paths, roads, and storage and collection points. This is due to various reasons:
 - Lack of awareness among farmers, sellers and buyers regarding management of vegetable waste. - Difficulty in cleaning due to nature of waste and habit of waste disposal from both sellers and buyers, and the waste starts decaying at those places.
 - Difficulties in monitoring of waste management, as number of users are very high especially during peak hours; but it is also a result of inefficient management.
- Due to improper solid waste management, the hygienic aspects of the market were very much compromised, dirt and smell all over the area.
- Waste management has been carried out on contract basis, individual stalls pay cleaners to clean and carry their vegetable related waste from stalls to common disposal area within the market area; other set of individuals are responsible for collecting waste from common areas to disposal vehicles; and then the solid waste are disposed to dumping site or composting sites. Although the system sounds efficient, it is very inefficient based upon the site observations and interviews.
- Composting of the solid waste from the market has not been successful; one of the reasons is all kind of waste being dumped to same place, segregation being major issue for the waste handlers (A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015)
- Almost 90% of the waste generated are organic waste which can be reused but are just being dumped. No any market has adopted biogas plant for the utilization of the solid waste which would have been beneficial both environmentally and economically.



Figure 39: Problem of Solid Waste Management

Source: ("A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015")

2.10.2. Environmental Pollution

- The noise pollution caused by marketing activities and from moving vehicles cause constant strain to the ears of the users and nearby residences.
- Considerable air pollution is noticed during peak hours of vehicular entry and exit periods, further aggravated by traffic congestion.
- Often there are complaints from the surrounding environment regarding smell, noise pollution, and sewage of market being infiltrating into the nearby wells of neighborhoods. (A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015)

2.10.3. Physical Aspects

- The location of vegetable market in residential cum commercial area is causing nuisance to the neighborhood and traffic congestion in the area.
- The physical infrastructures regarding road, pavement, water supply system and drainage are in dire state, due to lack of proper maintenance.
- Sales spaces are insufficient during peak hours of trading.
- Drainage problem is prominent mostly due to clogging of the solid waste in the drainage. (A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015)

2.10.4. Traffic Congestion

- Vehicle parking areas are poorly managed and insufficient giving rise to traffic congestion.

- The traffic congestion appeared not only inside but outside of the market too, as the market gate opens in the busy main road (which is also a highway and inner-city road). So, during entry and exit of vehicles from the gate there is always vehicular traffic disturbance in the major road causing lengthier traffic jams.
- Haphazard loading and unloading spaces within the market premises aggravates traffic congestion and confusion among the visitors of the market, as it affects pedestrian circulation within the market. (A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015)

2.10.5. Management Issues

- There are no rules and regulations/ laws regarding functioning of the vegetable market, which needs to be addressed timely for efficient market system.
- Although space for farmers market is provided, people are using footpath for trading, causing congestion in the market. There are also cases of non-farmers occupying the space whole day, exceeding trading hours of the farmers' market.
- Secondary renting provision seems to be working in the market, although it is not clearly visible. It is also difficult for the market committee to monitor such things because of socio cultural aspects of our society; for instance, a trader may bring new person and say he is the family member or friend who is to help him.
- Priority given to the old traders of the wholesale market may be demotivating factor for the new traders and hinder the essence of the competitive market.
- There is no provision of limiting the maximum number of traders in the wholesale market, leading to inefficient and chaotic market environment.
- The informal interviews suggested that the rent is taken even from illegal stalls at footpath area inside the market, thus one paying higher rent in permanent stalls and selling same produces suffer.
- Manpower per stall – Retail – owner and helper, Wholesale- owner, helper and staff.; and these names aren't mentioned in identity card of the owner; making it difficult to monitor if the sellers of the stalls are the original owners of the stalls. (A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015)

2.10.6. Macro Level Planning

- There is no planning approach, where importance and accessibility of vegetable markets are considered, in terms of location and scale of the market.
- There is no motivation for fresh vegetable consumption from the government, regarding the market facilities, infrastructures, planning and policies.
- Involvement of middlemen increases when farmers couldn't reach to wholesale markets on their own, poor infrastructural facilities are often the causes of this phenomenon.
- The current Market Information System lags the need of current market, as farmers haven't been able to benefit from the Market Information System as it only gives rates of the wholesale market, as farmers needs rates of local market where they can sell their produces.

- No provision of cold storage facilities near production areas, which results in tremendous amount of post-harvest wastage of vegetable produces.
- Chemical testing facility only in wholesale market causes wastage of produces, time and energy, incase vegetables are found chemically unacceptable.
- There are no collection centers near the production area, as a result seasonal surplus produces are often wasted, which could have been stored at sold later, resulting in mutual benefits for both producers and consumers.

(A Report on The Study of Vegetable Markets in Context of Kathmandu, 2015)

2.11. Identifying the Space requirement

For a new market the floor space and site requirements will be key factors in the preparation of any plan.

Step 1: Estimate sales space requirements

small-scale fruit and vegetable primary markets, from 3 to 7 tons per sq.m.

fruit and vegetable year-round assembly markets, from 10 to 15 tons per sq.m.

small-town fruit and vegetable open markets, from 5 to 10 tons per sq.m.

For best results the sales space should be around 20 percent of the total site area and, except in exceptional circumstances, should not exceed 40 percent. (Tracey-White, J. D.,1995).

Step 2: Identify Trading Space:

It is possible to calculate the number of trading spaces that might be allocated from the estimate of overall sales space required. (Tracey-White, J. D.,1995).

Using the previous example of 1 840 m² of sales space the calculation of the number of trading spaces might be as shown in Table.

Step 3: Consumption Estimates

The estimated consumption of fresh produce should be derived from the per caput data by relating it to estimates of the existing and future populations for the area served by the market. The following formula summarizes the calculation method: (Tracey-White, J. D.,1995).

Table 4
Sales space calculation (covered and open) for a basic rural market

	Throughput (tonnes per annum)	Space standard (tonnes/m ²)	Space needs (m ²)
	a	b	c (a + b)
Present needs			
Primary market section	5 400	4	1 350
Assembly market section	2 600	10	260
Total – present	8 000		1 610
Future needs (in 10 years)			
Primary market section	7 560	5	1 512
Assembly market section	3 920	12	327
Total – future	11 480		1 840

Figure 40: Estimation of sales space requirement

Table 5
Estimating trading spaces for a basic rural market

	Space needs (m ²)	Space per user (m ²)	Number of users
	a	b	c (a + b)
Present needs			
Primary market section	1 512		
• traders (60% of space)	907	10	90
• farmers (40% of space)	605	3	200
Assembly market section	328	6	55
Total	1 840		345

Figure 41: Identifying Trading Space

Source: Tracey-White, J. D., 1995

$$\text{Annual supply (tons)} = \text{total population served} \times \text{per caput consumption} \times 0.001$$

Step 4: Decide on the Market's Facilities

There are three broad types of facilities:

- those that are standard to all markets;
- specialized uses that may be required in some markets;
- and non-market facilities

Table 3: Market Facilities

Program	Area Requirement
Storages and cold stores	40% of commercial sales area
Circulation of Pedestrians	10% of commercial sales area
Office of market, management staff and basic facilities such as banking, extension services and farm input	5% of commercial sales area
Total	Gross Market Area

Step 5: Determine the area needed for the site

The built-up area of the site should be around 20 percent of the total site and under no circumstances should exceed 40 percent. In addition to the sales space some allowance should be made for other buildings that may need to be accommodated on the market site.

- The overall site area required to accommodate the covered space should be in the ratio of between 1: 4 and 1: 3 that is for every square meter of covered sales space an additional three to four square meters of site would be required.
- Exceptionally, this factor can be reduced to 1:2.5 if the site area is very limited and increased to 1: 5 if much of the trading is likely to be undertaken in the open.
- The overall site area in square meters can thus be derived by multiplying the gross market area by a factor of 2.5 to 5 to allow for traffic circulation, parking areas and site landscaping.
- 0.5 hectares per site per 2 neighborhoods. (Tracey-White, J. D.,1995).

2.12. Deciding on the Buildings

Tracey White has given four steps on deciding the building for the market on the basis of market stall, design infrastructures, environmental impact and market equipment. Following the steps would provide clear way on deciding what type of market stall or what features are to be included in the building.

Step 1: Design buildings

In the context of markets, buildings can include many forms of structures, ranging from simple isolated stalls and open-sided roofed sheds to fully enclosed buildings. The basic issue to resolve is whether the market should use open-air stalls, purpose-built buildings or a combination of both of these. The facilities required for sellers of fruits and vegetables are much simpler than those required for traders of higher-value goods, such as clothing, who will invariably need lock-up facilities. It is necessary to determine the number of sellers requiring facilities under cover and the number who prefer to sell in the open air, perhaps providing their own stall. In many periodic rural markets only, the permanent traders operate under cover. (Tracey-White, J. D.,1995).

Market Stall Design

The basic module of any market design is the individual market stall. The size of sales space may vary widely. Some sellers may only trade a single sack of fresh produce a day (25-50 kilograms). A small stall or trestle table would be appropriate for them. There may also be a need for very large stalls, for example, for specialized traders in grains or dry foods who require additional space for storage. (Tracey-White, J. D.,1995).

Standards of Stall design:

Table 4: Market Stall Design

DESCRIPTION	STANDARDS
Main thoroughfare of a market:	a 6-metre width aisle between stalls to allow for seating and other uses.
Aisles inside building:	minimum of 3.5 m to allow a group of three people walking together to pass one person standing by a stall, or two people walking to pass two other people.
Maximum distance between cross aisles inside buildings	12 m
Minimum stall depth (trader standing behind):	2 m for standing and stacking of boxes, plus 1 m for the counter
Minimum stall depth (trader sitting on stall):	1.2 m
Minimum stall height (trader sitting on stall):	0.4 m
Minimum stall height (trader standing in front):	0.7 m
Minimum stall width:	1.8m

Small lock-up stalls	between 2×2 m and 3×4 m, with sales space or table taking up from 30 to 50 percent of the area
Sales or table area per trader:	between 0.8 and 1.2 m ² , excluding standing space;
Ceiling height for market building	from 3.5 to 6 m.
Outdoor seating/low walls:	400 mm high and between 300 and 500 mm deep
Central market space for trading in the open:	maximum dimension between 20 and 25 m.
Width of minor pedestrian routes	not to exceed the height of the surrounding buildings

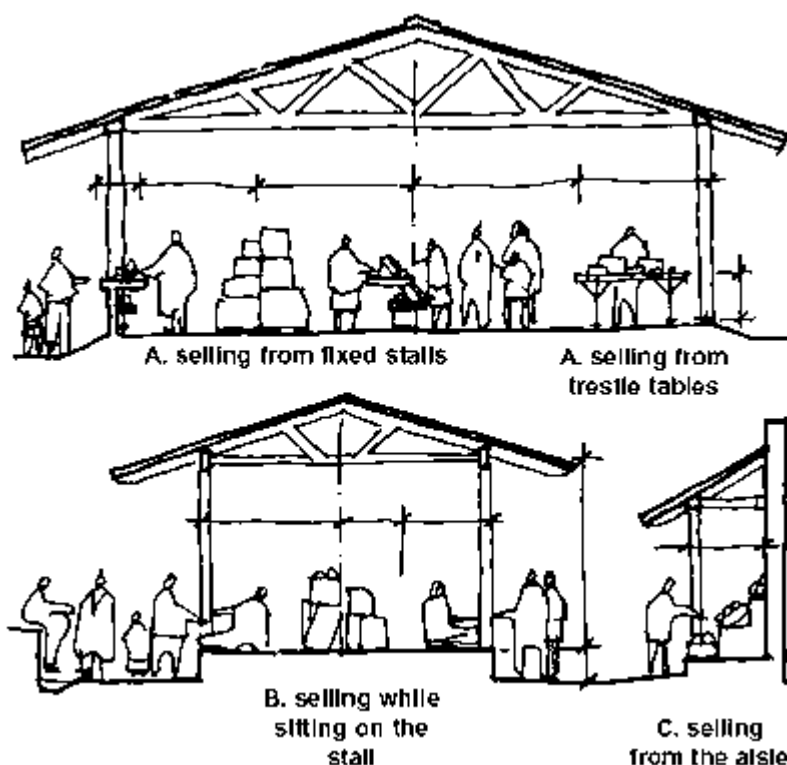


Figure 42: Market Stalls Design

Source: Tracy-White, J. (1991)

The design of market stalls will depend on whether open and what method is customary for the sale of produce. A way of understanding this is to look at the arrangement and the space needed as a cross section. There are three basic ways the sellers might use their sales spaces:

Example A: The trader stands behind a fixed stall or trestle table. Produce can be stored and displayed both under the stall and behind the trader.

Example B: The trader sits on the stall and serves the customer by reaching forwards over the displayed produce.

Example C: The trader stands in the aisle and serves the customer from goods displayed and stacked behind. (Tracey-White, J. D.,1995).

Step 2: Design Infrastructure

In parallel with the design of the market buildings the design of the infrastructure needs to be considered carefully.

- **Paving:** This is required for roads, parking areas and pedestrian circulation. Ideally, a market should have completely paved surfaces, using asphalt, in-situ concrete or, where vehicular traffic is minimal, some form of paving units such as pre-cast concrete or stone blocks.
- **Pedestrian safety measures:** At intersections of paths and roads it is necessary to provide a crossing where this thatched roof in a market in Papua New Guinea burned down. A. Shepherd A. Shepherd pedestrians have the right of way over vehicles. An effective method is to provide a physical interruption in the road, such as a speed hump, so that the vehicles are forced to slow down
- **Pitch markings:** For sales in open areas the space allocated to the traders, frequently called a “pitch”, should be clearly outlined. The size of the pitch should be based on the experience of stallholders’ needs. Methods for defining pitches include road-line painting or using a different construction material
- **Surface water drainage:** A key issue in designing any paving system is the method of drainage. Clogging of poorly designed or maintained drains is a common occurrence at many markets. In small markets it may not be necessary to have any internal drains within the market area as all the rainwater can run to perimeter drains. To counteract these problems the drainage channels, need to be set as flush as possible with the general level of the paving

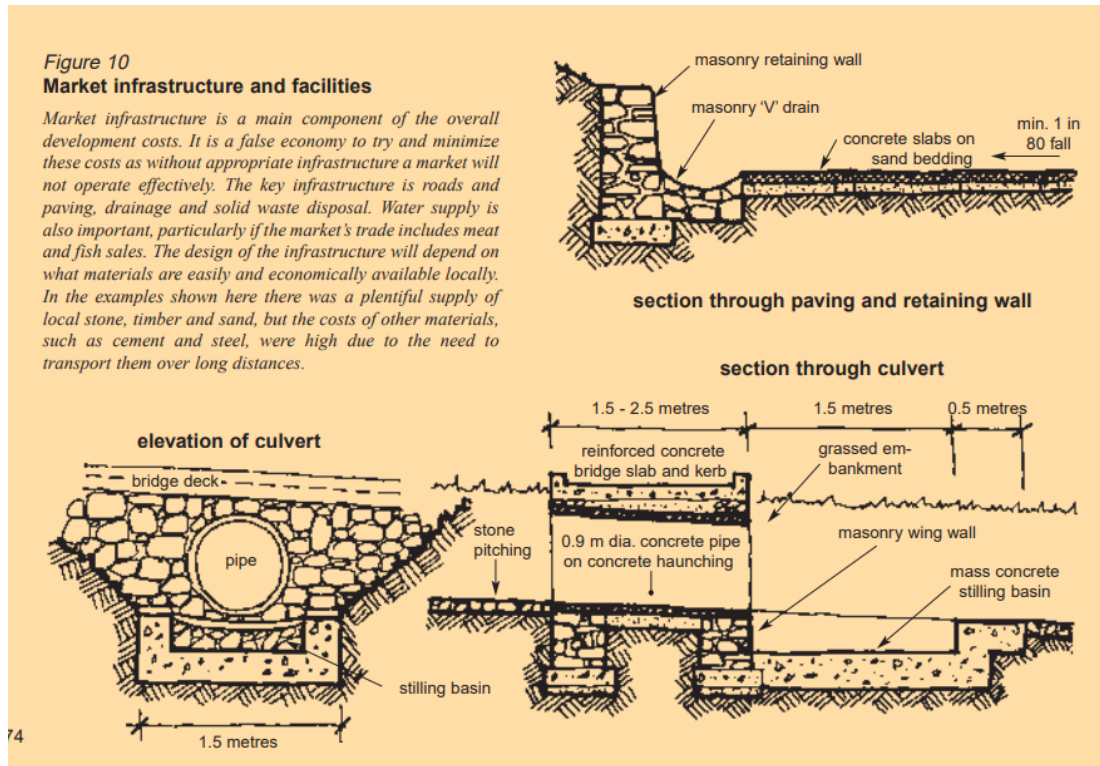


Figure 43: Market Infrastructure and facilities

Source: Tracy-White, J.,1995

- **Sewerage:** It is important that toilet provision is not made without there being an integral or nearby water supply for washing hands. There should also be provision for some form of on-site treatment of effluent (such as a septic tank).
 - Water supply standpipes or tube-wells at a maximum distance of 50 m from users (25 m preferred).
 - Meat and fish stalls with immediate access to water supply (adjacent).
 - Toilets (pit latrines and urinals) at a maximum distance of 100 m from users (50 m preferred). Space for latrines at 2 m² per 1 000 peak period market users.
 - Toilet provision for staff: 2 m² per 25 market employees (male and female separate). Minimum of 2 sq.m.
 - Dustbins or garbage pits at a maximum distance of 50 m from users (25 m preferred).
- **Water supply:** An approximate estimate for water demand at ultimate development of a typical 10,000 m² market, based on Nepal Water and Sewerage Board standards (Drinking water installation and drainage requirements in buildings in Nepal, page 88, n.d.), is as follows:

Table 5: Water Supply

Description	Daily Demand
Basic requirement assuming a "medium demand of 4 litres per m ² of effective floor area for covered markets = floor area of 10,000 m ² × 4 litres/m ²	40,000 litres
Cool storage requirements at 20 litres per ton = say 500 tons × 20 litres per ton	10,000 litres
Basic requirement	50,000 litres
Add 50 % contingency, incl. produce washing	25,000 litres
Estimated Total Daily Demand	75,000 litres

- **Sanitary Services:**

Table 6: Sanitary Service

Fitting	Male	Female	Market yards
Water closets	1 per 25 persons	1 per 15 persons	2 minimum plus 1 per 50 persons
Ablution taps	1 per wc plus 1 per 50 persons	1 per wc plus 1 per 50 persons	2 minimum plus 1 per 50 persons
Urinals	0 – 6 persons = 0 7 – 20 persons = 1 21 – 45 persons = 2 46 – 70 persons = 3 71 – 100 persons = 4	Not applicable	2 per 50 persons
Wash band basins	1 per 25 persons	1 per 15 persons	Not specified
Drinking foundations	1 per 100 persons	1 per 100 persons	Not specified
Clearer's sink	1 per floor		Not specified

- **Fire Safety:**
 - Fire hydrants spaced at approximately 30 meters intervals in loop systems encircling the main building and around the site periphery.
 - In designing the water supply system, a minimum fire-fighting flow of 34 liters per second (450 gallons per minute) should be aimed for.
 - 1 fire bucket per 100 m² of floor area (or part thereof);
 - 1 fire extinguisher per 600 m² of floor area (or part);
 - first aid kits and tools (asbestos blanket, hatchet, gloves, etc.) for each building or compartmented section;
 - internal fire hydrants to open-market sheds, served from overhead gravity fed tanks to a minimum pressure of 3 kg/cm².
 - The hydrants should be provided with wall-mounted hose reels to serve a maximum radius of 30 meters. (Tracey-White, 1991)

- **Electricity supply and street Lighting:** Lighting for market buildings is relatively easy as fittings can be suspended from the roof structure. The fittings should be robust (either industrial quality pendant fittings or fluorescent tubes) and easily accessible for replacement of bulbs or tubes. Long-life, low-energy fittings are highly appropriate for market buildings.

- **Fencing and gates:** Lighting for market buildings is relatively easy as fittings can be suspended from the roof structure. The fittings should be robust (either industrial quality pendant fittings or fluorescent tubes) and easily accessible for replacement of bulbs or tubes. Long-life, low-energy fittings are highly appropriate for market buildings.

Step 3: Identify Environmental Impact mitigation measures

Even if there are no official requirements for an EIA, it is advisable that environmental mitigation measures are incorporated as “best practice” in the design of markets.

Step 4: Decide on the Market Equipment

The next step is to decide on the equipment needed for the operation of the market. Most rural markets have only very limited equipment, which may include the following:

- Trestle tables and display stands
- Prefabricated market stalls.
- Prefabricated market stalls.
- Equipment for the disposal of solid-waste (Tracey-White, J. D., 1995).

2.13. Some Aspects to consider

Besides there are some factors that need to be considered that aids in better functioning of the market. That includes market architecture, sustainability, climatic influence on the building.

2.13.1.1. Market Architecture

Market architecture holds quite an importance in the field of marketing. An effective market architecture leads to an increase in the visibility of the marketplace. When the market architecture is done in the right ways, it leads to effective marketing.

Effective marketing can be defined as that process in which the prospects are made aware of the value and the importance of the design which is provided by a particular firm and then persuade those prospects into taking the next step of this process. Along with that the market structure clearly defines the layout of the entire market in the most clarified ways.

The farmers market designs are different from other buildings. They are focused on the planning layout, architectural layout, indoor building environment, future building transformation models, and comprehensive evaluation after starting to use. The indoor building ventilation design and analysis are critical for farmers markets.

Farmers market now reflects the social values that go well beyond the simple conceptualization of the market as an economic opportunity for farmers to sell their products. The farmer's market is a promenade, working market and market neighborhood. The challenges of the farmers market architectures are to design a building on a small budget and user friendly. It needs to balance different needs, cost, sustaining and eco-friendly. The integrated architectural designs by using engineering analysis are popular in green building designs. For this farmers market, architectural designers design the building and vendors' stands that hold the food and other goods. The design goals of the farmers market are to have a low cost to build and are convenient to use.

Natural Ventilation Design Analysis

Achieving a healthy and aesthetic environment for the occupants is one of the basic rules for building design. The ventilation introduces outdoor air inside the buildings and is mainly used to control indoor air quality by diluting and displacing indoor pollutants and odor gases. Analysis of the ventilation is one of the ways to make sure design meets the standards.

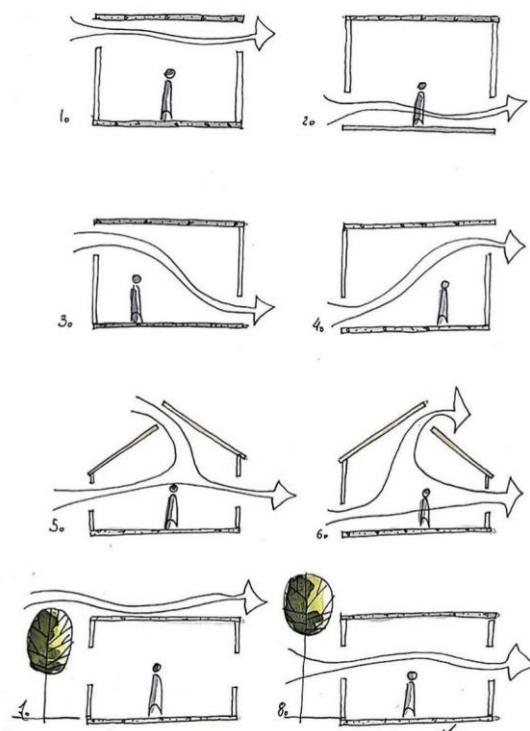


Figure 44: Natural Ventilation Design Analysis

Source: <https://arquitetapage.com.br/>

2.13.1.2. Climatic Influences

Every building we design must be responsive to regional variations in climate. This will affect the building orientation and fenestration but also use of outside space for activities. For facilities like culture centers covered areas are calculated as one-half of the gross square foot area of indoor areas. Building planning and design will depend on where the building is located (US Army, 1976).

- Severe climate dictates compact building forms.
- Temperate climate permits the use of natural ventilation and light.
- Warm climate permits maximum use of covered exterior work areas in addition to indoor space.

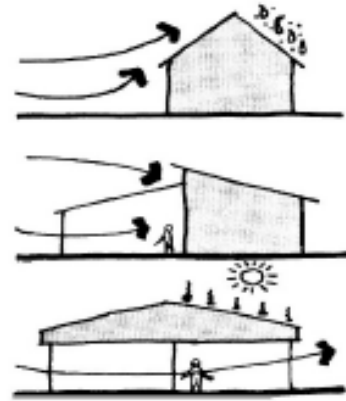


Figure 45: Climatic Influence on Building

Source: <https://arquitetapage.com.br/>

2.13.1.3. Energy Conservation

Energy conservation is the topic that the today's word needs to consider and apply extensively. This can be done efficiently by understanding the local climate conditions, topography, trees, solar exposure and other natural features.

Factors like building orientation, compact building shapes, and wall shading, mechanical and electrical design offer opportunities for energy conservation. A heat 'recovery system will also be useful since the craft center generates certain amount of heat from the crafting processes and equipment. Stepping down the requirements for heating, cooling, lighting, can make a considerable difference and the automatic regulation of mechanical equipment can also result in great savings (US Army, 1976).

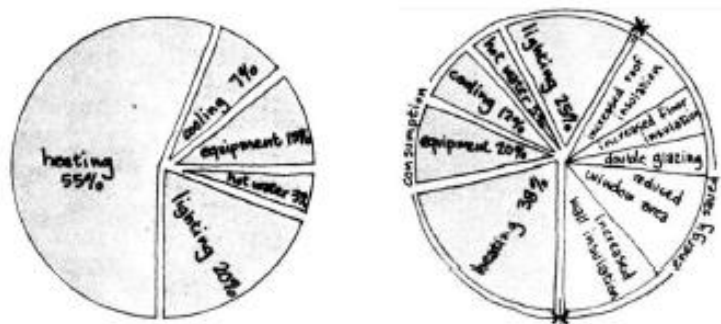


Figure 46: Typical Annual Energy Consumption

Source: <https://arquitetapage.com.br/>

3. CASE STUDY

National, Regional and International case studies were chosen so that different operation method and features of the market could be analyzed. The case study was particularly chosen due to their significance to the key aspects outlined in the earlier parts. The studies that were carried out are:

NATIONAL CASE STUDY

- Kalimati Fruits and Vegetable Market, Kalimati
- Surya Vinayak Harit Krishi Thok Bazar, Suryavinayak
- Le-Sherpa Farmer's Market, Lazimpat

INTERNATIONAL CASE STUDY

- Davis Farmer's Market, U.S.A
- Bryan Farmer's Market, Bryan

REGIONAL CASE STUDY

- Dilli Haat, Dilli

NATIONAL CASE STUDY

3.1. Kalimati Fruits and Vegetable Market

Kalimati Fruits and Vegetable Market is the oldest Farmer's Market of the town. It is one of the largest markets in Nepal for fresh produce, serving as a hub for farmers and vendors to sell their products. The market offers a wide variety of fruits and vegetables, including locally grown products such as tomatoes, cucumbers, onions, and green leafy vegetables, as well as imported produce like apples, oranges, and grapes. The market has a vast network of suppliers and buyers, and its products are distributed across the country. It plays a crucial role in the supply chain of fresh produce in Nepal, providing affordable and high-quality fruits and vegetables to consumers.



Figure 47: Kalimati Fruits and Vegetable Market

3.1.1. Introduction

Location: Kalimati, Kathmandu

Total Area: 20370 sq.m (45 Ropani approx.)

Phased Construction: 1988-2000

Design Population: 7 lakhs

Market Typology: Permanent Wholesale Market with retailing facility

Topography: Fairly Flat

Selection Criteria

- Professionally designed market with aid from UNCDF, standardized by FAO
- Oldest market designated for farmers

3.1.2. Description



Figure 48: Kalimati Retail Market

Kalimati Fruits and Vegetable Market is the oldest marketplace in Nepal. Kalimati market has been functioning as a major fruits and vegetable market over 30 years. From 2043 B.S., Kalimati market started to function with small-scale infrastructures, however most of the current market infrastructures are a result of aid from UNCDF in 1990. For efficient management of the market, “Kalimati fruits and vegetable wholesale market development board” was formed, under Development Board Act-2013, in 2051 B.S. However, the board was again reestablished as “Kalimati fruits and vegetable market development board” under Development Board Act-2013 in 2058 B.S.; to broaden the responsibility of the committee. (RECPHEC, 2016)

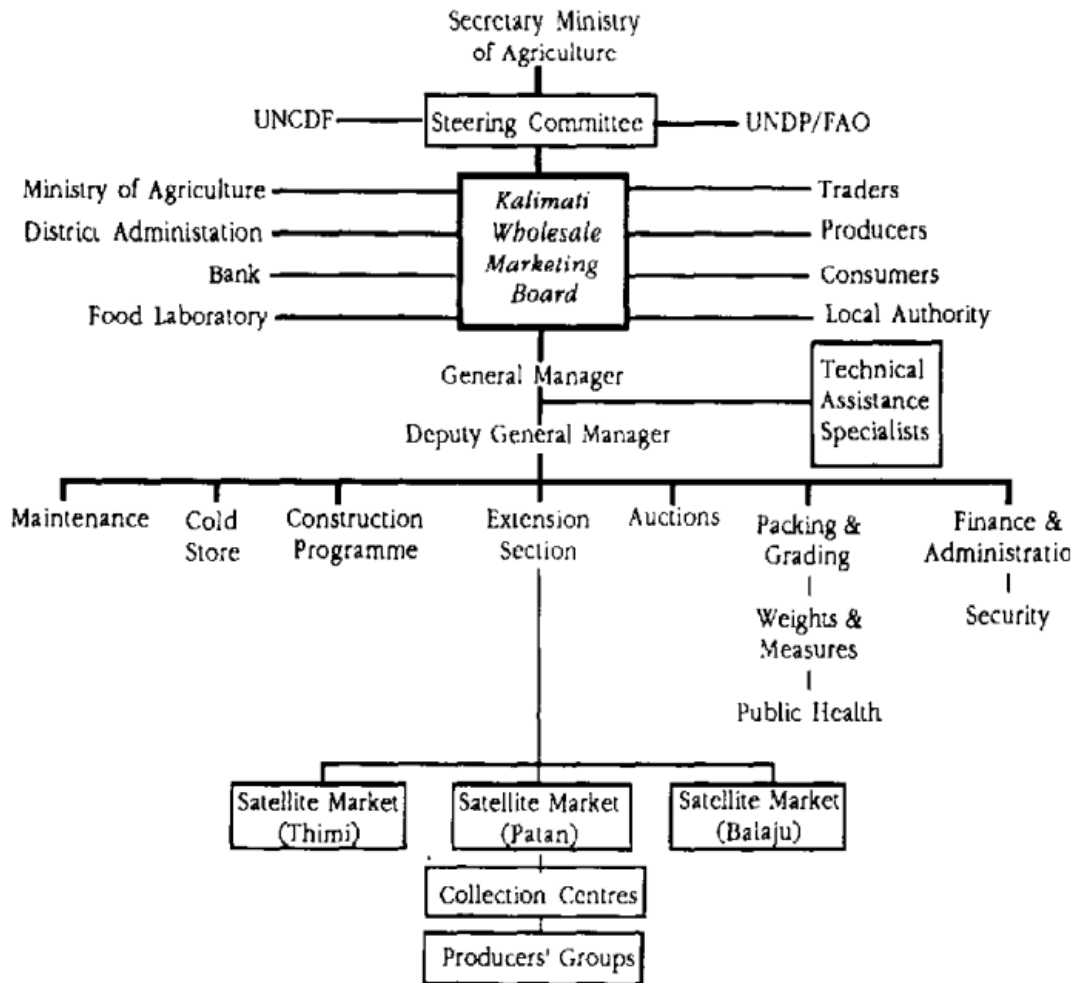


Figure 50: Kalimati Board of Execution

Source: (RECPHEC, 2016)

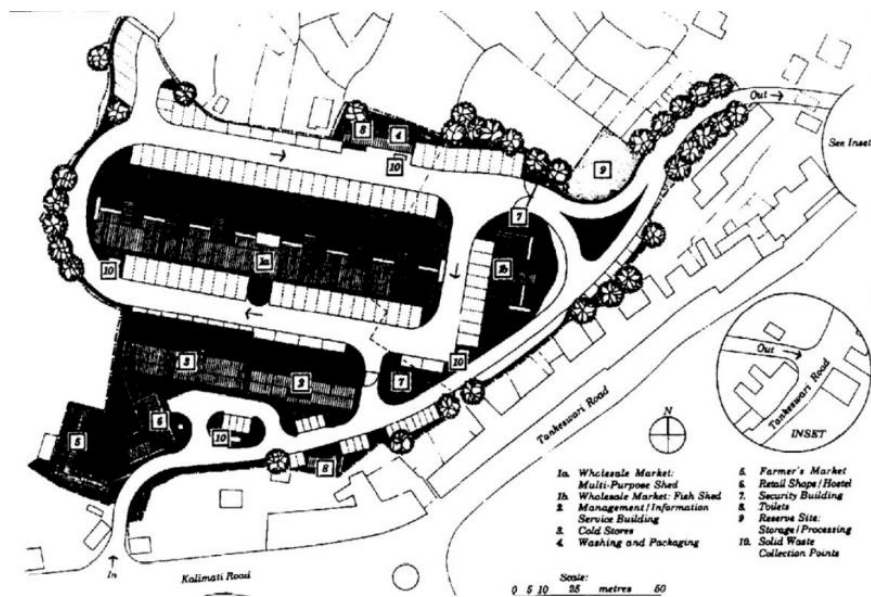


Figure 49: Kalimati Proposed Plan

Source: (RECPHEC, 2016)

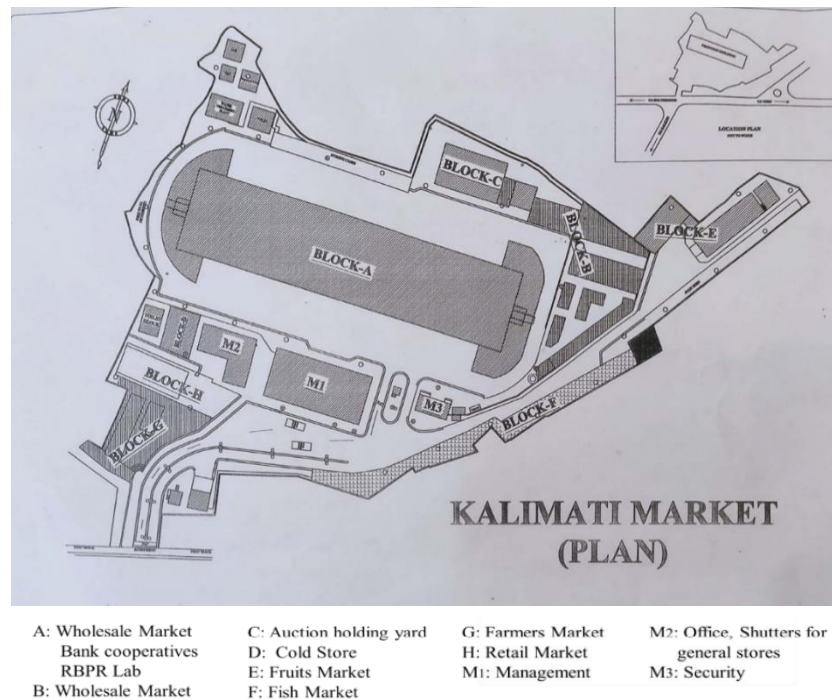


Figure 51: Kalimati Existing Plan

Source: (RECPHEC, 2016)

3.1.3. Different Market

Kalimati market is the combination of different types of market products. Separate spaces have been allocated for various market types i.e. wholesale market, Retail Market, Farmers' Market as well as Fish Market as per their functions and requirements.

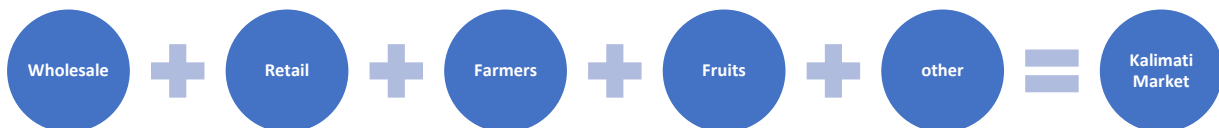


Figure 52: Illustration for total market composition in Kalimati

3.1.3.1. Retail Market

- To serve those who trade little quantities of produce, a retail market is available.
- 81 parking spaces in total are designated for this use.
- To operate in this area, traders must obtain a board permit. The monthly rent is set based on the amount of space the traders use.



Figure 53: Kalimati Retail Market

3.1.3.2. Wholesale Market

- The wholesale market occupies the majority of the Kalimati market.
- 26 of the 322 stalls designated for wholesale marketing are reserved for farmer organizations or co-operatives.
- The wholesale market's floor is divided into sections, including one for potatoes, one for onions, and one for fresh vegetables.
- Zoning is also done in accordance with many cooperative organizations and groupings.
- 5 kilograms is the minimum amount that can be exchanged in the wholesale market; trading below this level is prohibited.
- One must obtain a permit from the committee and pay the rent for the designated space and other facilities in order to conduct business in the wholesale market.



Figure 54: Kalimati Wholesale Market

3.1.3.3. Farmers Market

- Farmers are allowed to sell their daily fresh vegetable harvests at the Kalimati market area.
- For this purpose, there are two sheds in front of the entry gate and a hard-paved open area in front of it.
- The market is permitted to be open twice daily, from early in the morning to 10 a.m., and from 3 p.m. to late in the evening.
- Farmers must pay a nominal fee of NRs 10 each time they utilize the facility to sell their produce in order to do so.
- A daily average of 75 to 150 farmers are thought to come; the bulk are thought to be from Kathmandu.



Figure 55: Kalimati Farmer's Market

3.1.3.4. Fish Market

- The fish market has twelve cages designated for it next to the ice factory.
- The market, which was previously located in Khichapokhari, is currently being reestablished in this market.
- A daily average of 10 metric tons of fish are imported into the Kalimati market.

3.1.3.5. Fruit Market

- A fruit market is available in one of the sheds and around some portion of the market.
- In addition to seasonal fruits, international fruits are also available there.



Figure 56: Kalimati Fruits Market

3.1.3.6. Other

- Some spaces are also provided for, seeds, fertilizers, dairy products and Agro products, along with necessary materials
- Other services like canteen, storage, bank, administration restrooms have also been provided in the market.

3.1.4. Major Supply Sectors for the Market

Most of the produces are supplied nationally; while 24.37% are imported from India, and 1.67% from China.

Where are vegetables at Kalimati Fruits and Vegetable Market sourced from?

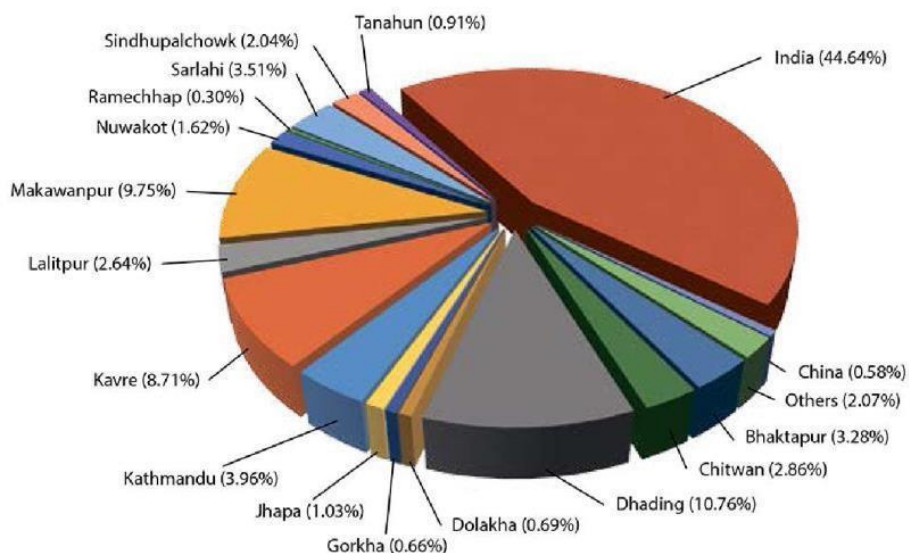


Figure 57: Major Supply chart of Kalimati Market

Source: (RECPHEC, 2016)

3.1.5. Percentage of produce supplied

Almost 85% of the produce supplied is vegetables in Kalimati fruits and Vegetable market, vegetable being the major selling produce, 7% of the produce is fruits, 4% of spices are supplied and remaining are of fishes and other products.

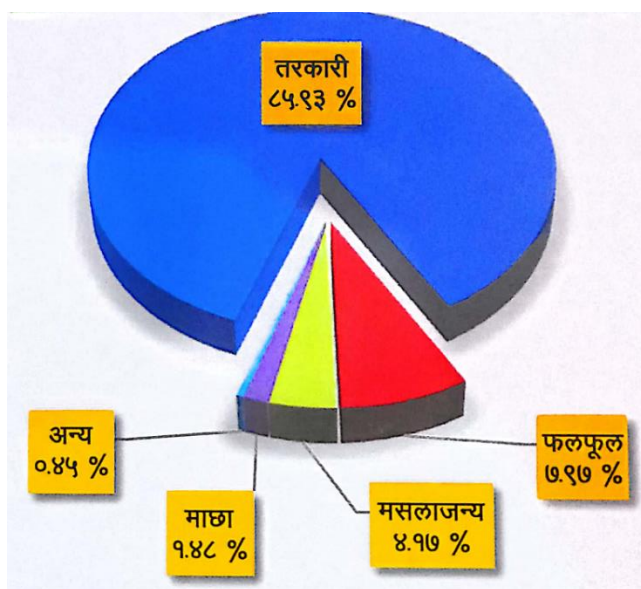


Figure 58: Percentage Supply chart of Kalimati Market

Source: (RECPHEC, 2016)

3.1.6. Activity mapping of the market

If we look at the market's activity, we can see that loading and unloading begin as soon as it opens at 2 am. Additionally, there is a weighing bridge where, as the vehicle enters the market, data input shows the weight of the produce brought within the market after deducting the weight of the vehicle. Additionally, the product is auctioned off early in the morning, typically between 2 and 6 a.m. The bulk product is kept in storage cages with distinct cages for each type of produce, such as sections for onions, potatoes, and so on. Starting at 6 a.m., the main wholesale and retail market is open all day. normally from 6 a.m. to 8 p.m., with morning and evening being the highest times. For farmers, there is a specific provision. In essence, it starts working at 4 a.m. I-10a.m. a.m. and beginning at 3 p.m. to 8p.m. In the two sheds that are positioned in front of the entry gate in the evening

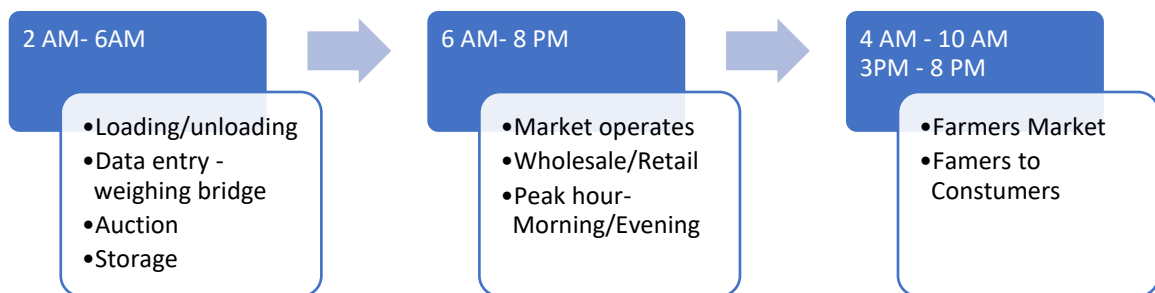


Figure 60: Illustration for Activity Mapping of Kalimati Market



Figure 59: Section of storing cage

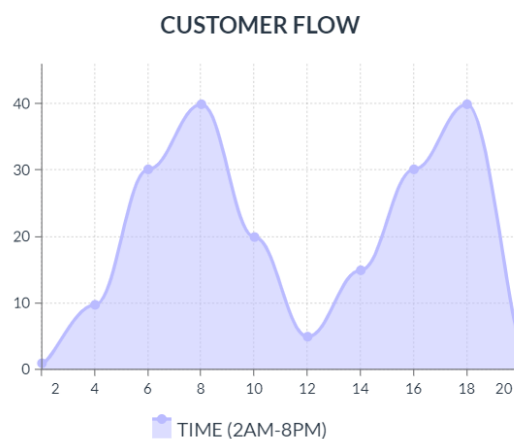


Figure 61: Illustration for Customer flow in Kalimati Market



Figure 63: Section of Wholesale Market

On analyzing the customer flow of the market, it was found that the market operates at its peak from 6a.m. to 8a.m. in the morning and from 4p.m. to 6p.m. in the evening where there is maximum no. of customer flow. During the mid-day time the customer flow is minimum. The above chart shows the customer flow on various time of the day.



Figure 62: Loading-Unloading



Figure 64: Weighing Bridge



Figure 65: Storing Cage

3.1.7. Program

There are various services and facilities provided by the Kalimati market. Kalimati Market doesn't only provide stalls for buying and selling but has many other supporting facilities as well.

Program allocation schedule (Tracey-White, 1991)

Table 7: Program Allocation of Kalimati Market

Land use/ accommodation at ground floor level	Completion by end of phase:			% Of total
	II	III	IV	
Buildings:				
1. Multi-purpose shed	1680	2640	3600	17.7
2. Fish shed	-	-	336	1.7
3. Cold stores	-	-	880	4.3
4. Management and administration	560	560	560	2.8
5. Retail unit and hostel	-	308	308	1.5
6. Security block	72	72	72	0.3
7. Main gatehouse	-	-	24	0.1
8. Washing, grading and packing	128	128	128	0.6
9. Toilets	152	152	152	0.8
Sub-total, Buildings	2590	3840	6060	29.8
Site Development:				
Farmers' market area	710	710	710	3.5
1. Roads (on-site only)	3360	3640	5955	29.2
2. Parking areas	2020	2190	3570	17.5
3. Pavements and landscape areas	1940	2100	3495	17.2
4. Drainage and other reserves	150	165	230	1.1
5. Future expansion area (paved)	-	-	350	1.7
Total site area	13780	13780	20370	100

3.1.8. Vehicle Parking Schedule

Kalimati Market has huge area allocated for loading and unloading as it is the major function of the market. Even though various types of vehicles are given their respective parking space, vehicle is seen randomly parked obstructing the traffic flow.

Table 8: Vehicle Parking Schedule

Type of vehicles & Commodity carried	Throughput: (m/t/day)		Load factor (m/t)	Total no. of Vehicles per day	Peak period ratio	Parking spaces required (number)
	Average day	Peak season				
Within market						
Retailers' small trucks & pick-ups:						
1. Vegetables	610	122	1.5	81	0.3	24
2. Fruit	33	66	1	66	0.3	20
3. Fish	13	26	0.5	52	0.6	31
Sub total	107	214		199		75
Add 22.5% for suppliers' vehicles / contingency						17
Truck parking spaces required @ 8m × 4m						92
Add for wholesaler's car @ 5.5m × 2.4m						8
Total parking spaces within the market						100
Outside market:						
Private cars and official vehicles:						
1. One parking space for each senior official						12
2. Add 150% for visitors / general public						18
Car parking spaces required @ 5.5m × 2.4						30
Add 20% for short term truck parking @ 8m × 4m						6
Total parking space outside the market						36
Grand total						136

3.1.9. Physical Infrastructures of the Market

Table 9: Infrastructure of Kalimati Market

Land Use	Area (Sq.m)	% of total
Buildings	6060	29.8
Farmers' Market Area	710	3.5
Roads	5955	29.2
Parking Areas	3570	17.5
Footpaths & landscaped areas	3495	17.2
Drainage & other services	580	2.8
Total site area	20370	100.0

The total site area of the market is 45 ropanis (22,893 sq.m.). There are various services and facilities provided by the Kalimati market:

- Multipurpose building - 4903 sq.m.
- Wholesale market building (old fish shed) – 508 sq.m.
- Wholesale market sheds – 48 stalls
- Retail market sheds -2 nos.
- Farmers’ market – 2 sheds and hard paved open space In front
- Farmers’ market shutters – 6 nos.
- Fish market – 12 cages
- Ice-plant 220 sq.m., 15 metric ton daily production
- Cold room 4.5 metric ton storage capacity, Freezer room 9 metric ton storage capacity
- Administration building – 792 sq.m.
- Storing cages – 24 nos.
- Building with 12 shutter shops (near administrative building and farmers’ market)
- 53 rooms above Multipurpose building and fish market □ Bank area (currently used as garlic and ginger trading space) □ Restaurant – 1 nos.
- Mesh/ Canteen – 4 nos.
- Electricity station
- Generator – 250 KVA capacity
- Water tank – 160,000 litres capacity; with deep tubewell
- Water purification plant
- Toilets
- Black topped road
- Parking area
- Loading/ Un-loading area, etc.

Market security service

There is provision of 24 hours security for the committee and market users. Total of 30 staffs are related to security services among total of 79 staffs of the market.

Waste collection and management

Huge amount of waste is generated in the market on daily basis due to the nature of vegetable produces. Waste collection and management is being carried out with involvement from private sectors.

Market information service

The board has managed to collect current rates of produces from the market during morning and daytime; in order to inform farmers, traders and concerned stakeholders about the current trading rates of the produces. The information is conveyed through various means – digital scrolling board in the market, daily bulletins, news channels, emails, websites etc.

Quantity and Quality Controlling

In order to strive the market towards healthy, competitive and qualitative market, the committee has been carrying out quantity and quality controlling of the produces being traded in periodic basis; in co-ordination with Nepal Standards Department (Gunastarthatha Naaptaul Bibhag, 2015).

3.1.10. Waste Collection and Management

Due to the nature of vegetable products, enormous amounts of waste are produced in the market every day. The private sector is involved in the management and collection of waste. However, waste management huge problem of the market. The residue of the produce could be seen everywhere which has made the environment of the market unpleasant.



Figure 66: Scenarios of Waste Disposal in Kalimati Market

3.1.11. Issues of The Market

Most of the issues is related to the fact that the market is working over the design population and is being overworked past its limits:

- Uncontrolled entry/exit of Agro produces transport vehicles in the market.
- Problem in additional market extension within the site area.
- Problem in waste management and scarcity of dumping sites.
- Difficulty in enhancing and strengthening the skills of manpower involved in the market, both traders and staffs.
- Minimal use of technology and machineries for handling, packaging and grading of produces.
- Problem in internal import and transportation of Agro produces.
- Lack of co-operation of the development board of Kalimati with other Agro markets, including government and nongovernment sectors.

3.1.12. Inferences

The inferences drawn from the Kalimati fruits and Vegetable Market on the basis of the conclusion and major findings from the literature reviews:

Table 10: Inferences from Kalimati Market

4 Realms of farmers' market	
Realms	Findings
1. Promenade	6' circulation corridor, more intimate circulation in retail market
2. Working market	Market stalls each of area 80 sq. ft., cold stores, storing cages, mesh, bank area, administration and office spaces, holding yards and auction, loading-unloading platform
3. Market landscape	Lacks soft landscape and relaxation spaces, only hard pavements and parking area, lacks green and blue features and children play area
4. Market neighborhood	Highly dense urban neighborhood, issues of traffic congestion, noise and bad odour to neighborhood, not inclusive to neighborhood culture
4 Placemaking Attributes	
Attributes	Findings
5. Access & Linkages	2.6 km away from ring road, accessed through inner city road, lacks universal accesses, controlled entry points not a permeable design approach
6. Uses & Activities	Limited to food related procurement, addresses only economic aspects, lacks more engaging activities
7. Comfort & Image	Uncomfortable, issues of sanitary, place lessness, lacks relaxation and seating spaces, over crowded and lacks aesthetic character.
8. Sociability	Intimate shopping experience and social interaction – vendor customer interaction but people not prefer to socialize here due to unhygienic premise

3.2. Surya Vinayak Harit Krishi Thok Bazar

Surya Vinayak Harit Krishi Thok Bazar is the recently built largest farmer's market of the country. It aims in providing the local vendors with the business opportunities. The market is constructed by the entrepreneur Durga Prasad Prasai and has been developing to be the leading market. However, the market could have been done a lot better architecturally and could have given something to a community being in the core area of the Bhaktapur.



Figure 67: Surya Vinayak Harit Krishi Thok Bazar

3.2.1. Introduction

Location: Adarsha Chowk, Bhaktapur

Total Area: 25,436 (50 Ropani approx.)

Phased Construction: 2018-2021

Access: 8m (150m away from Araniko highway)

Market Typology: Permanent Wholesale Market with retailing facility

Topography: Fairly Flat

Selection Criteria

- Largest Famer's Market of Nepal
- Modern Consideration

3.2.2. Description



Figure 68: View from the Restaurant

Suryabinayak Green Agriculture Wholesale Market is the country's largest vegetable market located in Suryabinayak. It is in an area of 35 ropanis. The market has two separate entry and exit points. One entrance is connected to the Araniko Highway and the other to the main road in Sipadol. A one-way road has been set up to avoid traffic jams in the market. Parking space has been made available in the market and arrangements have been made to transport vegetables to the market. Rakesh Prasain, chairman of Suryabinayak Green Agriculture Wholesale Market, informed that the largest managed agricultural market in Nepal has been brought into operation with an investment of Rs. 320 million.

There are 750 stalls inside the market. The market is open from 2 AM to 8 PM every day. It is a wholesale market, but locals can also set up their retailer stalls. The facility currently provides markets for fresh fruits and vegetables. Fish and meat market are yet to be set up in the space. There are 2,200 booths in the market. The market has been set up with the objective of providing employment to 4,400 people and providing vegetables to the consumers at reasonable prices by purchasing them from local farmers.

According to Entrepreneur Durga Prasai, "The vegetable market has been set up to give fair payments to the farmers and end the system where the middlemen are making up to 50 percent profit." He claims that more than 10,000 farmers will benefit from the establishment of the vegetable market.

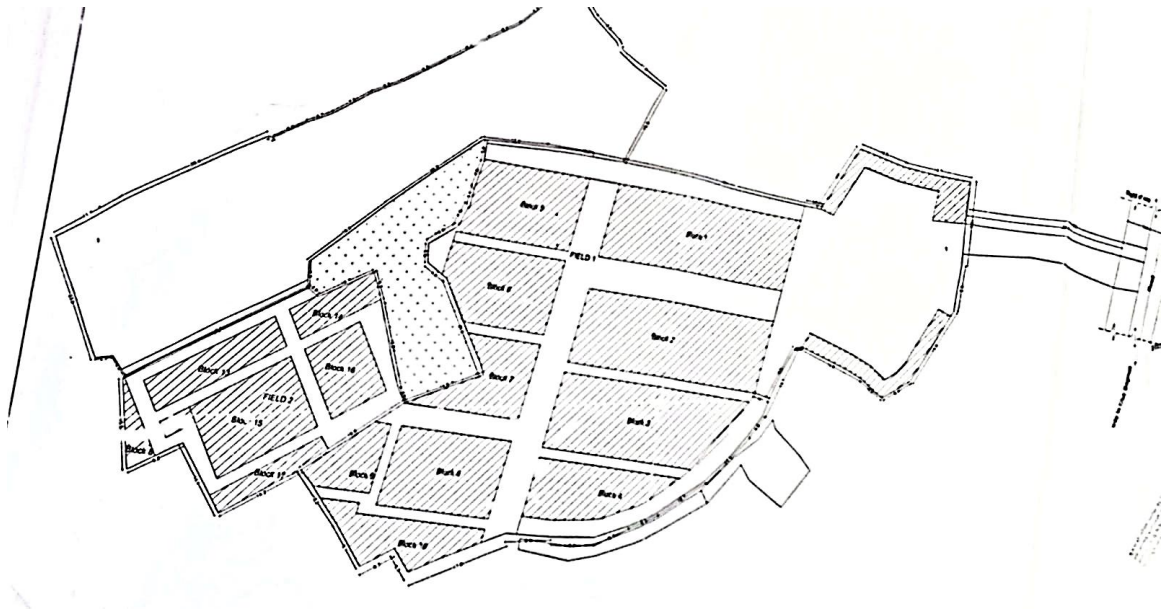


Figure 69: Plan of Surya Vinayak Market

SITE PLAN

Total area of the structure: 44071.275 sq. ft. (30.94% coverage)

Studying the plan of the market it is clear that much attention has been given for the arrangement of the traffic flow which is the major function of the market. After that the stalls seems to have been placed as per space acquired. Not much has been thought about the green spaces or spaces for public interaction

FIELD 1 Area

SN	Block	Area (m2)	Area (ft2)
1	Block 1	539.973	5801.457
2	Block 2	539.973	5801.457
3	Block 3	485.251	5223.198
4	Block 4	218.578	2352.754
5	Block 5	278.653	2995.626
6	Block 6	186.081	2002.959
7	Block 7	293.743	3161.823
8	Block 8	85.765	923.166
9	Block 9	170.515	1835.408
10	Block 10	290.22	3123.902
11	Block 11	118.436	1274.834
12	Block 12	86.626	889.378
13	Guard House	56.387	606.634
14	Toilet1	17.282	186.021
Sub Total		3368.523	36182.82

FIELD 2 Area

SN	Block	Area (m2)	Area (ft2)
1	Block 13	134.694	1449.834
2	Block 14	93.878	1010.494
3	Block 15	260.160	2800.338
4	Block 16	218.578	2352.754
5	Block 17	140.743	1514.948
6	Toilet	8.398	90.349
Sub Total		732.861	7888.451
Total Area = (Field 1 + Field 2)		36182.82+7888.451= 44071.275 sq ft	

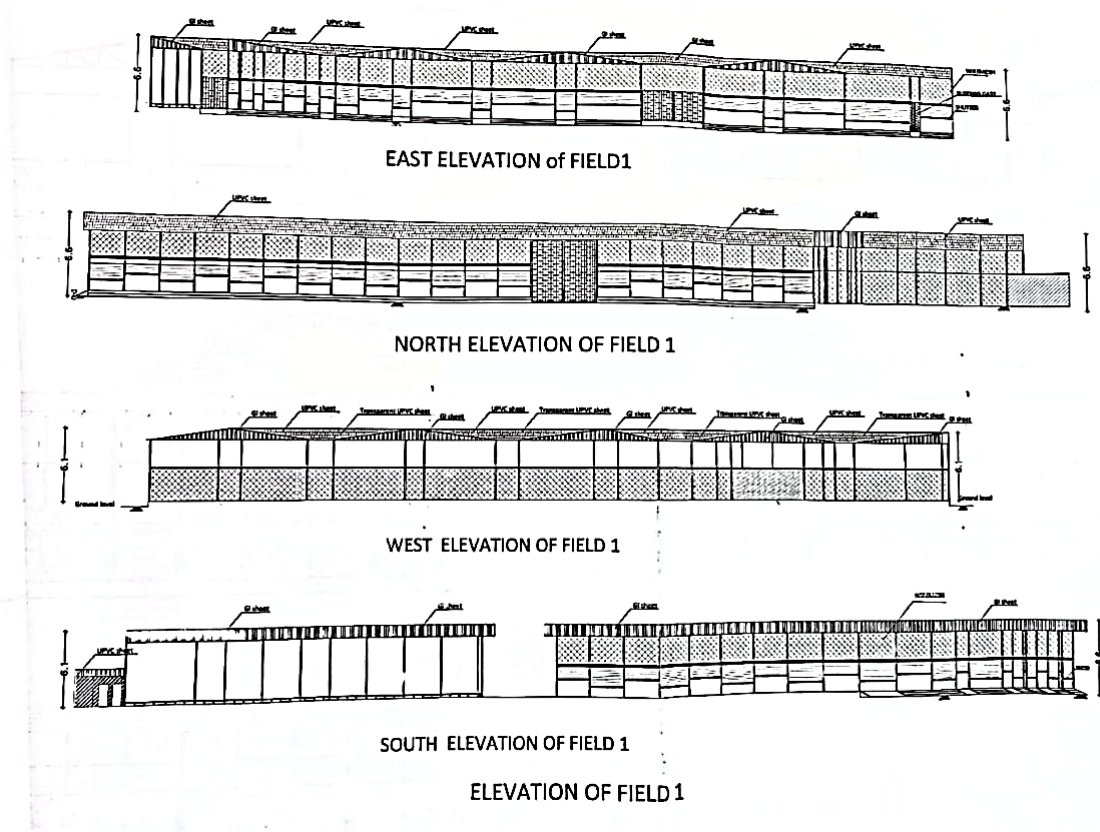


Figure 70: Elevations of Surya Vinayak Market

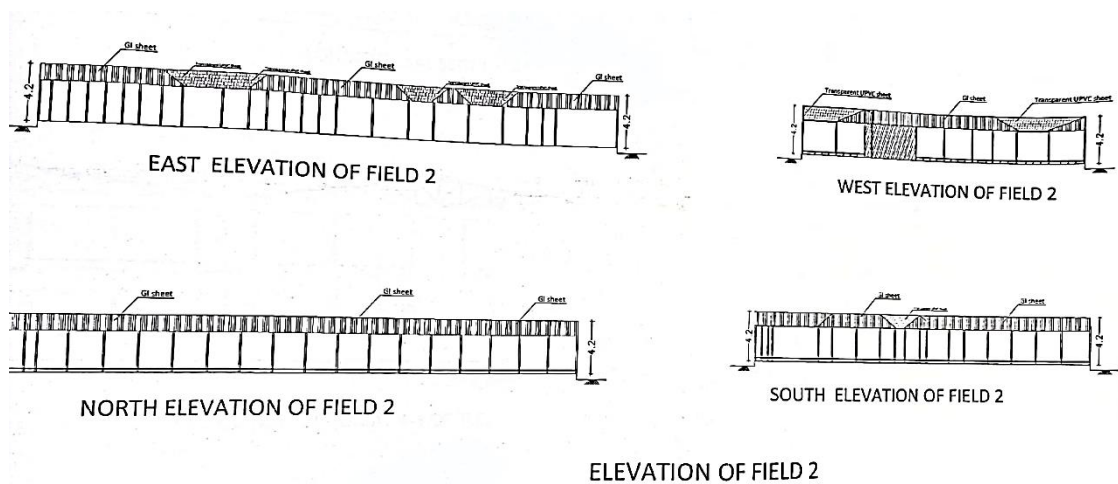


Figure 71: Elevations of Surya Vinayak Market

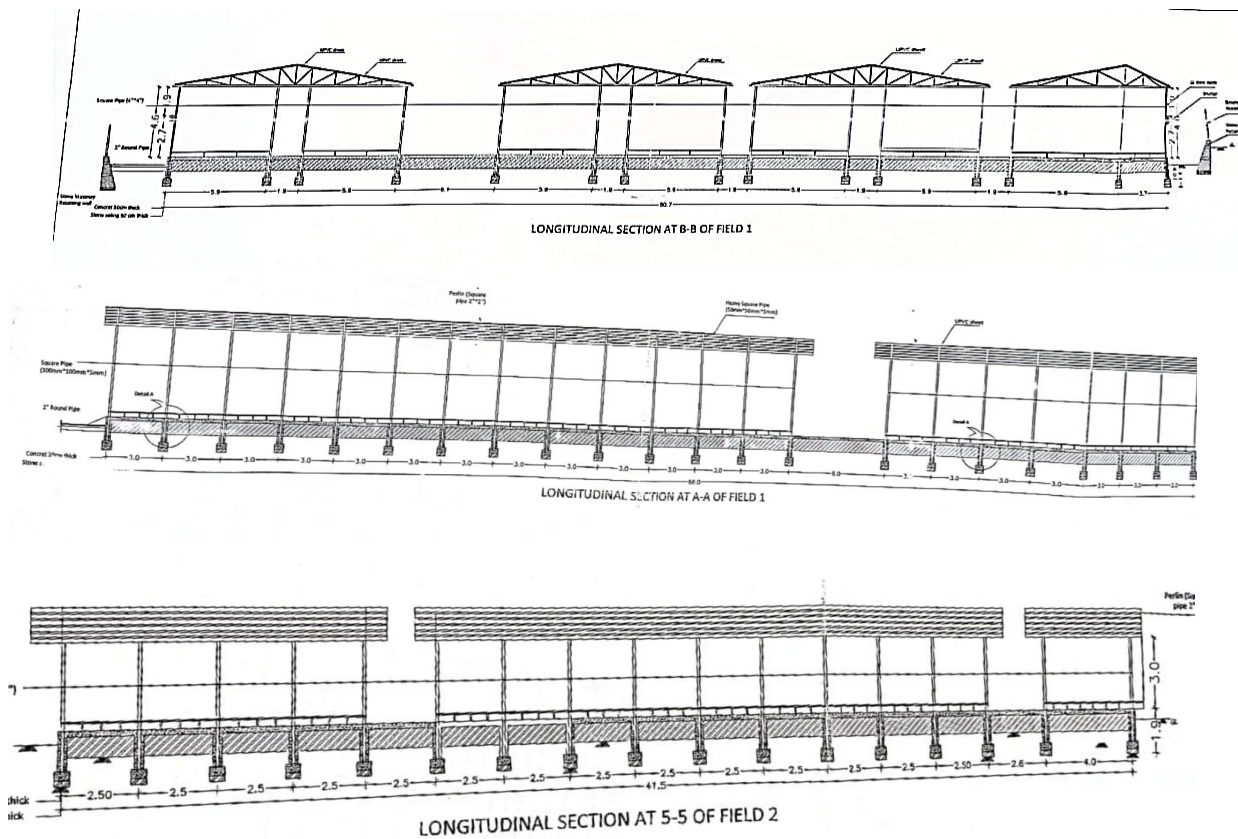


Figure 72: Longitudinal Section of Surya Vinayak Market

On analysis of the section and elevation of the market, it was seen that the form of the market was not much worked out as compared to its function. Volume break seems to be lacking creating the long monotonous linear elevation that didn't create any interesting spaces within the market. Some intervention could have been done on breaking the linear feel and monotonous effect on the skyline of the building.

3.2.3. Major Supply Sectors for the Market

Most of the produce is supplied from the local farmers of Bhaktapur, also from Chitwan, Kavre, Sindhupalchok. Also, garlic and ginger are being supplied from China. However, the major targeted vendors of this market are local vendors from the town which support locally produced goods grown by them.

3.2.4. Activity Mapping of The Market

The market opens at three in the morning, with loading and unloading being the primary activity. However, loading and unloading continue throughout the day. The market's busiest times are in the morning and late at night; during the day, there is little activity. The market is open till 8 or 9 o'clock at night.

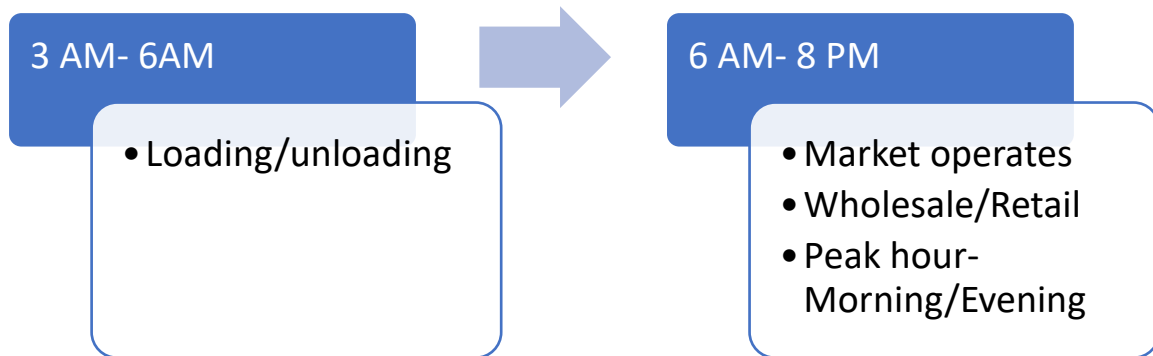


Figure 73: Illustration for Activity Mapping of Surya Vinayak Market

On analyzing the customer flow of the market, it was found that the market operates at its peak from 6a.m. to 8a.m. in the morning and from 4p.m. to 6p.m. in the evening where there is maximum no. of customer flow. During the mid-day time the customer flow is minimum. The above chart shows the customer flow on various time of the day.

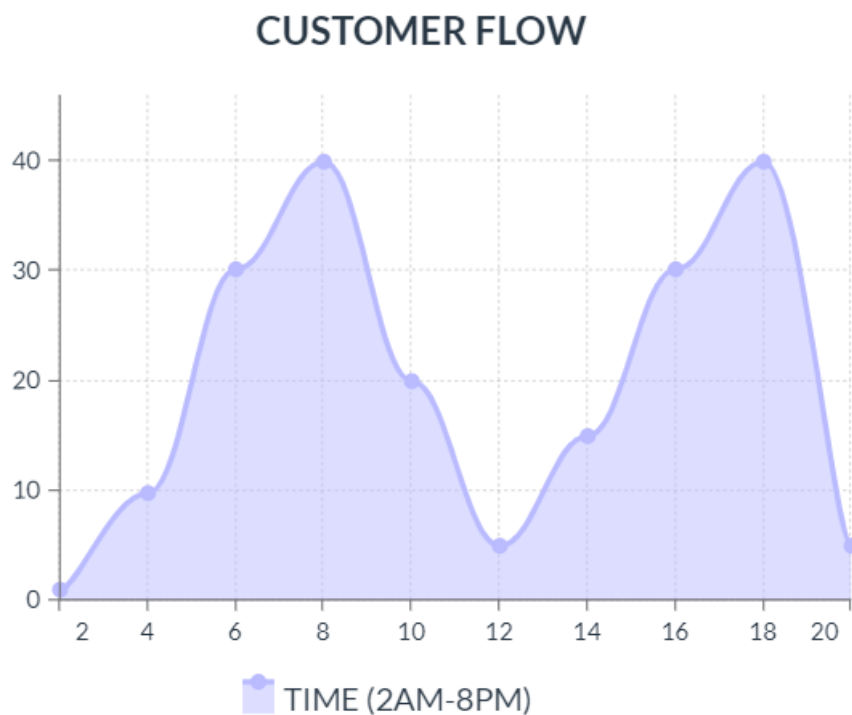


Figure 74: Illustration for Customer flow in Surya Vinayak Harit Krishi Bazaar

3.2.5. Spaces Inside the Market



Figure 75: 20' Wide Promenade

20' wide promenade where vehicular access is available for the easy access to the stalls.



Figure 79: Parking

Two parking are provided toward the entry and exit of the market and the whole market has been made one way for easy vehicular flow.



Figure 76: Stalls Arrangement in Surya Vinayak Market

There are 2200 stalls arranged in the market. Out of which 60% of stalls are in use. The stalls are provided to farmers at Rs. 100 per day and some criteria is to be fulfilled by the vendors to book the stalls with 1 Lakh deposit



Figure 77: Loading - Unloading

Loading and Unloading was easier as the vehicles could reach inside the market and even 18-wheel truck could easily access to the market.



Figure 78: Parking

3.2.6. Physical Infrastructures of the Market

The total site area of the market is 50 ropanis (25,436 sq.m.). There are various services and facilities provided by the Surya Vinayak market:

- Stalls for vegetables: 2200 (60% in use)
- Fruits section: 4 shutters
- Chicken :1 block
- Meat market: 5 compartments (separate compartment for buffalo, goat, fish, pig, ox)
- Administration building
- Bank
- Block still in construction where all other products are to be sold
- Mesh/ Canteen – 5 nos.
- Electricity station
- Generator – 250 KVA capacity
- Drainage
- Water tank – 160,000 liters capacity
- Fire extinguisher
- Toilets
- Black topped road
- Parking area
- Loading/ Un-loading area, etc.

3.2.7. Waste Collection and Management

Due to the nature of vegetable products, enormous amounts of waste are produced in the market every day. Waste management and collection are done by the private sector. There are not many issues with trash because the market is new. Cleanliness has been given its own staff. Only a few organic wastes on the side of the stall, which are collected in the morning, were visible during the day.

3.2.8. Issues of the Market

The market was recently constructed, thus most of the factors were taken into consideration while designing and constructing it. The market was constructed as a marketplace only, so it consists of some problems as to what a true marketplace should represent.

1. Lack of Public Spaces
2. Does not Contribute much to the public life of a community
3. Solid waste management
4. More number of stalls than required due to which space isn't being utilized properly

3.2.9. Inferences

The inferences drawn from the Surya Vinayak Market on the basis of the conclusion and major findings from the literature reviews:

Table 11: Inference from Surya Vinayak Market

4 Realms of farmers' market	
Realms	Findings
1. Promenade	Promenade of about 20' allowing one-way vehicular circulation to each stall
2. Working market	Market stalls each of area 80 sq. ft., cold stores, storing cages, mesh, bank area, administration and office spaces, holding yards and auction, loading-unloading platform
3. Market landscape	Lacks soft landscape and relaxation spaces, only hard pavements and parking area, lacks green and blue features and children play area
4. Market neighborhood	Highly dense urban neighborhood,
4 Placemaking Attributes	
Attributes	Findings
5. Access & Linkages	150 m away from Araniko highway, accessed main highway, inclusiveness of universal accesses, controlled entry points not a permeable design approach
6. Uses & Activities	Limited to food related procurement, addresses only economic aspects, lacks more engaging activities
7. Comfort & Image	Uncomfortable, place lessness, lacks relaxation and seating spaces, over crowded and lacks aesthetic character.
8. Sociability	Intimate shopping experience and social interaction, lack of space for socialization

3.3. Le-Sherpa Farmers Market

Le-Sherpa Farmer's Market is the popular periodic Farmers' Market that operates on every Saturday. Even though the market is only open on Saturdays for 3-4 hours, it is more popular than other permanent markets due to its ambience and the way it has integrated the landscape with the working market.



Figure 80: Le-Sherpa Farmer's Market

3.3.1. Introduction

Location: Lazimpat, Kathmandu

Total Area: 950sq.m. approx.

Phased Construction: since 2012 AD

Owner: Francios Driard

Market Typology: Periodic semi-permanent market

Topography: Fairly Flat

Selection Criteria

- Major Tourist attraction
- Periodic Market with farmer's market its major function
- Socialization is the major target of the market

3.3.2. Description

The recently constructed Le Sherpa restaurant is next to the Lazimpat Le Sherpa Farmer's Market, which is laid out on a multileveled garden area. All of the items for sale are perishables such delectable cheeses made with milk from Himalayan cows, goats, and yaks, as well as a wide variety of stalls where one can buy a meal, a cup of coffee, freshly squeezed juice, or even a bottle of wine. Every Saturday from 8 am to 12:30 or so, Lazimpat hosts the Le Sherpa Farmer's Market. Although many of the vendors are veteran Nepalese makers, this is also a venue for up-and-comers to flourish.

Every Saturday, 88 sellers congregate in this kind of semi-enclosed market to sell their unique goods. Both locals and visitors are included in the target audience. There are probably 800 to 1000 people moving through. Each seller is given a temporary space measuring 6' by 4' for small kiosks and 8' x 4' for large ones. Very inclusive strategy encouraging both domestic and international producers and artisans to showcase their cuisine and cultures. The numerous tourists in the area are enthralled by this distinctive strategy and are drawn to partake in their food culture and enjoy the lovely setting of the Le Sherpa farmers' market, which offers a variety of interesting activities.

3.3.3. Main Idea

“To put the vendors of quality food product, local foods, directly to clients with no middleman, all that in a garden so that clients would enjoy coming, spending time, socializing, drinking and doing their weekly shopping.”

- Francois Driard

- Eat fresh, eat slow, Eat local
- The market servers as a place of encounter between clients, farmers and artisans, facilitating discovery, debate and tasting

It has excellent places to hang out and unwind. In the food court, there is a concept of "dampa" and "paluto." It provides the "paluto all-you-can" concept, which is essentially a "eat all you can" restaurant done in the "dampa" fashion. You can prepare your own utensils, sauces, water, plates, and even rice in a dampa-style concept where you choose your fresh or raw meat, get it weighed, and ask what kind of cooking you want.

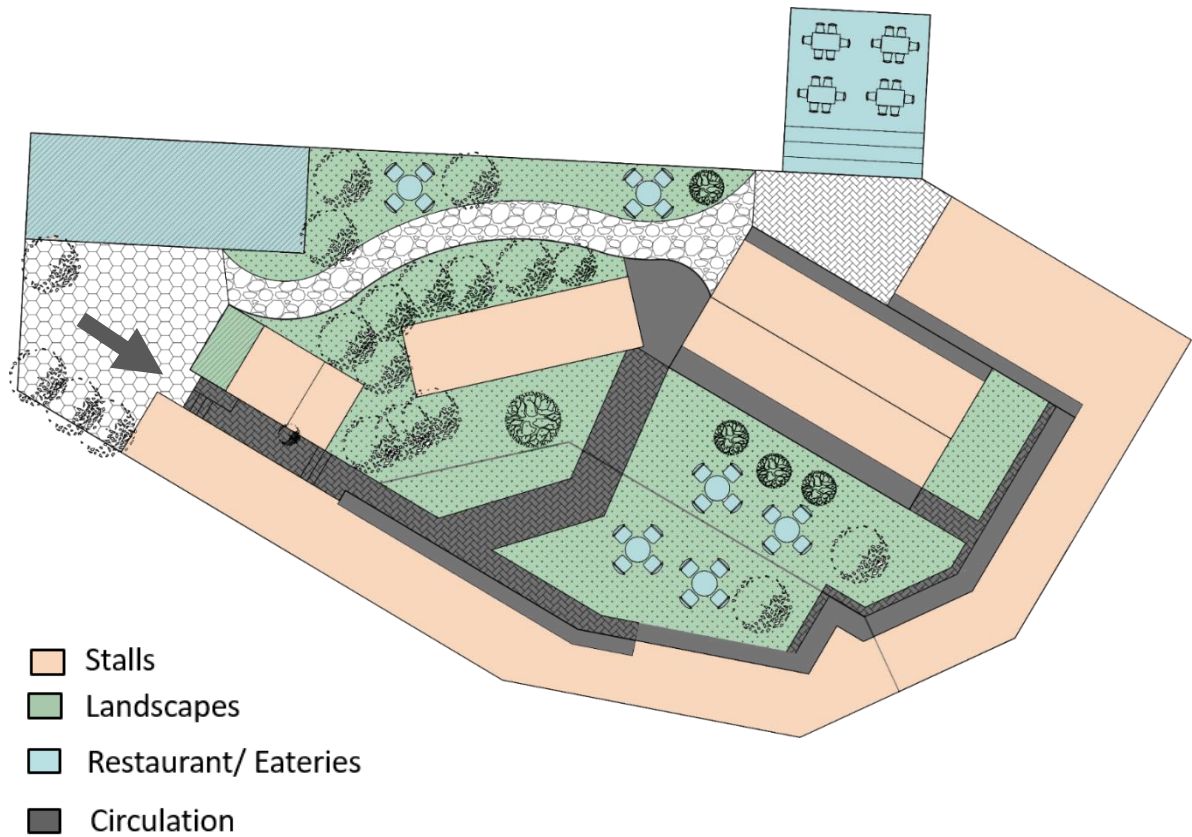


Figure 82: Plan of Le-Sherpa Market

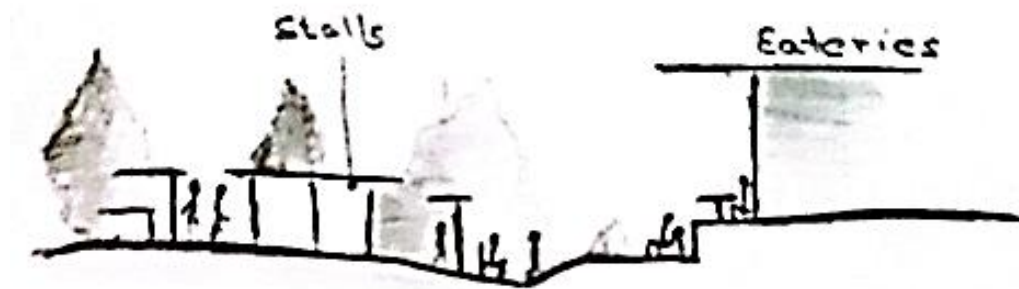


Figure 81: Section of Le-Sherpa Market

3.3.4. Activity Mapping of The Market

While the market opens at 7 a.m., vendors begin unloading their produce as early as 5 or 6 a.m. Between 7 and 10 a.m., more people shop at the farmers market, and between 10 and 12 people come here for the cafés and restaurants.

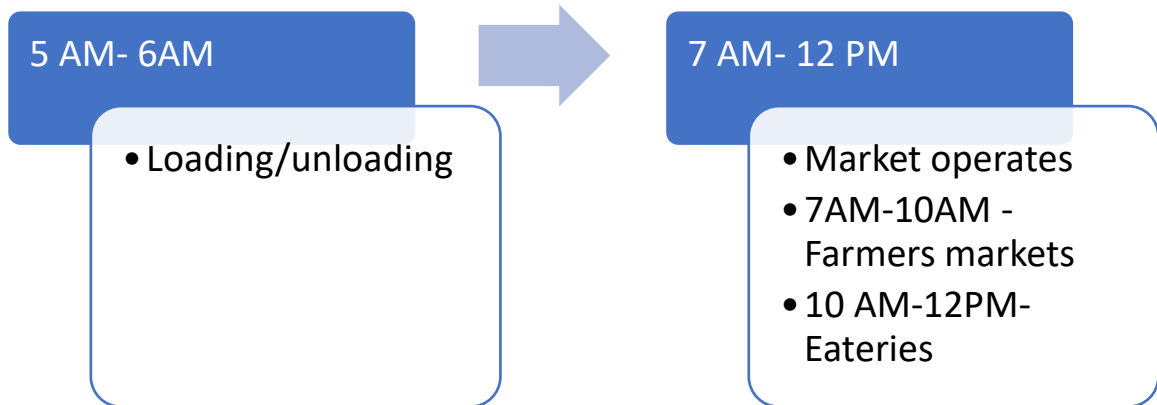


Figure 83: Illustration for Activity Mapping of Le-Sherpa Market

3.3.5. Spaces inside the market



Figure 85: Entry to the Market



Figure 84: Farmers' Market



Figure 86: Stalls in Promenade



Figure 87: Market Landscape

3.3.6. Issues of The Market

- There is problem of parking for the customers; Parking is quite far from the market.
- There is no proper signage about the market, so the access is little confusing.
- The space is not enough during the peak hour.
- The market has now been just socialization center and the lost its original concept.
- Since the market isn't enclosed during the monsoon season the operation of market seems quite difficult.

3.3.7. Inferences

The inferences drawn from the Le-Sherpa Farmers Market on the basis of the conclusion and major findings from the literature reviews:

Table 12: Inference from Le-Sherpa Market

4 Realms of farmers' market	
Realms	Findings
1. Promenade	Intimate promenade of about 4' – 5' favoring social interaction
2. Working market	Display of products on temporary stalls and kiosks along one side of the promenade, no proper parking
3. Market landscape	Multi-tiered garden, open lawn, relaxation space at center, a greenhouse nursery
4. Market neighborhood	A tourist area, dense settlement surrounds the market with Shital niwas in its proximity, invites local artisans and producers
4 Placemaking Attributes	
Attributes	Findings
5. Access & Linkages	No proper signage, has a boundary, privately owned, Vehicular and pedestrian access but no provision for disabled
6. Uses & Activities	Quick service restaurants and eateries, creational spaces, procurement of fresh and unique products, music and other themed activities inviting local artists
7. Comfort & Image	Greenery, seating spaces over landscape mounds, relaxation spaces, though lacks benches and landscape furniture.
8. Sociability	Local attraction and engaging spaces, unique products favoring more social interaction between vendors and customers, recreational opportunities around the food

INTERNATIONAL CASE STUDY

3.4. Davis Farmer's Market

The Davis Farmers Market is a well-known outdoor market located in Davis, California. It has been operating for over 40 years and is open on Wednesdays and Saturdays, year-round. The market offers a wide variety of fresh produce, meats, cheeses, baked goods, and prepared foods from local farmers, ranchers, and food artisans.



Figure 88: Davis Farmer's Market

Source: <https://theaggie.org/2020/04/22/how-the-davis-farmers-market-and-the-community-are-adjusting/>

3.4.1. Introduction

Location: California, USA

Area: 5 acres (40 Ropani approx.)

Phased Construction: 1975

Market Typology: Permanent Wholesale Market with retailing facility

Selection Criteria

- "Connecting Farm and Community"
- Davis Farmers' market has become a successful institution at the heart of community life in Davis
- creating new business opportunities and strengthening the bonds of community.

3.4.2. Description

The Davis Farmers' Market is one of the most well-known and successful farmers markets in the state of California. The involvement of numerous community organizations, businesses, and individuals has established the Davis Farmers' Market (DFM) as a center of local community life and culture. The ambiance of this market attracts large numbers of local families and students, as well as visitors from all around California, the U.S., and abroad. The market serves as a community gathering place, tourist destination, and source for a wide range of direct-marketed fresh vegetables, fruits, flowers, prepared foods and crafts. As such, the DFM provides a unique forum that has fostered the development of many small businesses and has played an important role in the larger business community of Davis.

A young farmer starting out would find a very different setting at the DFM today than the market's environment of 25 years ago. The DFM is now among the largest farmers' markets in California, with an average of 85 vendors every Saturday. Over the course of the year, 180 different vendors attend the market. While many of the vendors are still local, others come from all across Northern California, and even as far away as Oxnard and Santa Maria in Southern California. Operating year around, the Saturday market attracts 5,000 to 7,000 people each week, and up to 10,000 during special events. Annual gross sales exceed \$1.5 million. The market is governed by the Davis Farmers' Market Association, a non-profit organization, through an 11-member Board of Directors consisting of eight farmer-vendors, one non-agricultural vendor, and two community representatives. The DFM still operates in its original Central Park location, but many improvements have been made to the park, enhancing the environment of the market. In 1984, a covered structure was built by the city of Davis, which now houses a large portion of the market's vendors and makes year around operation more viable. The city's master plan for the park guided the construction of a large deck adjacent to the structure, which was funded by the Davis Farmers' Market Association. (About Us - Davis Farmers Market, n.d.)

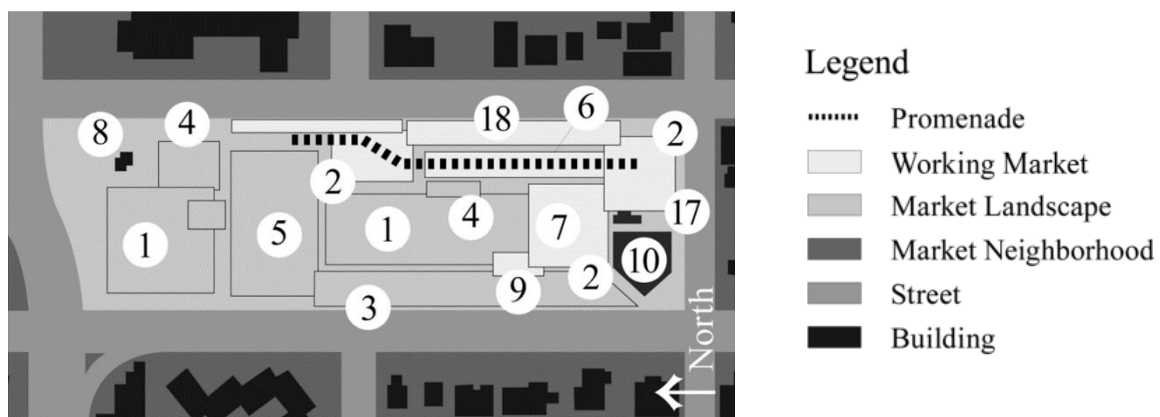


Figure 89: Plan of Davis Farmer's Market

Source: (Francis and Griffith)

3.4.3. Concept

- The Farm-to-School Connection
- Expanded Park and a pavilion
- A community gathering place
- Connecting vendors and costumers

Today, market shoppers take heart as they watch hundreds of children enjoying the adjacent play equipment. Another favorite of the children is the old-fashioned pedal-powered carousel, which was funded by the community. In 1995, the Davis Educational Foundation (predecessor to today's Davis Farmers Market Foundation) put The Flying Carousel of the Delta Breeze on the north side of the park. Designed by fifth-generation carousel builder William Dentzel, the community painted the beloved flying horses, pigs and other magical animals. The carousel, overseen by the market, raises funds for school classrooms that sign up to run it for a day, giving them any profits earned during their tenure. (About Us - Davis Farmers Market)

This connection between the Davis schools and the market is stronger than ever and provides a context for future development. In 2005, I renewed my role with the market by serving on its board of directors. Randii and I agreed that the association needed a tax-exempt public educational foundation, and we knew the one we wanted. The two of us, with the Davis Farm to School Connection steering committee members, under the leadership of Dorothy Peterson, helped the school district add a farmers' market salad bar to its school lunch program in 2001. Conversely, the farm to school group had raised funds for improving recycling at the Davis Farmers Market to mirror a program in the schools. The relationship had worked well, and in 2007, the Davis Educational Foundation became the market's foundation, renamed the Davis Farmers Market Foundation, and Dorothy Peterson became its chair. The market now had a formal way to receive funds for educational programming in the schools and the community.

3.4.4. Members of Market

1. Executive Directors
2. Board of Directors
3. Farmer Representatives
4. Non-Farmer Representative
5. Consumer Representative



Figure 90: Stall inside Davis Market

Source: <https://theaggie.org/2020/04/22/how-the-davis-farmers-market-and-the-community-are-adjusting/>

3.4.5. Inferences

The market provides a wholesome experience and a fresh environment within the premises. The market consists of all the physical realms that a farmers' market has. The four realms are incorporated in the design. The concept of "Connecting market and community" is a wonderful approach to both the farmers' and the visitors providing a new experience to all the users.

Table 13: Inference from Davis Farmer's Market

4 Realms of farmers' market	
Realms	Elements
1. Promenade	14-foot-wide promenade has an I-shaped configuration within the pavilion, extends past the pavilion to accommodate seasonal market expansion.
2. Working market	The working market makes use of angled parking along adjacent streets and provides small storage facility for market signage, an information kiosk, and an open-air pavilion with lighting and utility connections. Sunscreens have been added along the west side of the pavilion for protection from the afternoon glare. Restrooms are also provided on site
3. Market landscape	The market landscape is composed of children's play area, great central lawn, rose and butterfly gardens, a mature sycamore grove, a historic carousel, a raised wooden deck encircling a heritage oak tree, and teen center
4. Market neighborhood	The market neighborhood includes the University of California Davis, the University Arboretum, the Davis Commons, Aggie Village, the historic town center of Davis with a moderately-scaled retail land-use density with restaurants and cafes.
4 Place making attributes	
Attributes	Findings
5. Access & Linkages	Access through main road, inclusiveness of the universal design
6. Uses & Activities	Quick service restaurants and eateries, creational spaces, procurement of fresh and unique products, music and other themed activities inviting local artists
7. Comfort & Image	Greenery, seating spaces over landscape mounds, relaxation spaces, though lacks benches and landscape furniture.
8. Sociability	Local attraction and engaging spaces, unique products favoring more social interaction between vendors and customers, recreational opportunities around the food

3.5. Bryan Urban Farmer's Market



Figure 91: Bryan Urban Farmer's Market

Source: The Tree Project, 2016

3.5.1. Introduction

Location: Downtown Bryan, Brazos Valley

Area: Approx. 2 acres

Market Typology: Permanent Farmer's Market

Selection Criteria

The project is selected based on the objectives of the project which are as follows:

1. Propose a program to reclaim the site and enhance it economically, socially, and ecologically.
2. Provide connectivity to surrounding properties, such as St. Joseph Catholic Church.
3. Provide greater context between the site and the community.
4. Provide new features and characteristics in re-imagining the identity of the site.
5. Provide spatial quality for the program's proposed activities.

3.5.2. Description

The market is near downtown Bryan with approximately two acres of area. The east boundary is public parking for St. Joseph Catholic Church. There are two historic structures on the site: a residential house dating to 1871 and a carriage house dating to 1880. (The Tree Project, 2016)

The following five objectives were identified through meetings with city officials, community residents, and representatives of the funding entity during the design of the market:

- Propose a program to reclaim the site and enhance it economically, socially, and ecologically.
- Provide connectivity to surrounding properties, such as St. Joseph Catholic Church.
- Provide greater context between the site and the community.
- Provide new features and characteristics in re-imagining the identity of the site.
- Provide spatial quality for the program’s proposed activities.

Along the site’s south boundary, a long, permanent farmers’ market designed as a modular pavilion unit, named The Tree. The Tree unit acts as an autonomous shading structure, with a multilayered roof stemming from a cluster of columns. The proposed series of identical sections, placed side by side, creates a row of farmers’ market stalls. Each section, or “tree,” provides approximately 100 square feet of shaded area (8 x 12 feet of vendor space) supported by a cluster of four 6 x 6-inch timber posts. Traditional Japanese architecture inspired the market structure: repetition is the logic of the roofing system, and the design serves both structural and architectural needs.

3.5.3. Architectural Intervention

Along the site’s south boundary, a long, permanent farmers’ market designed as a modular pavilion unit, named The Tree. The Tree unit acts as an autonomous shading structure, with a multilayered roof stemming from a cluster of columns. The proposed series of identical sections, placed side by side, creates a row of farmers’ market stalls. Each section, or “tree,” provides approximately 100 square feet of shaded area (8 x 12 feet of vendor space) supported by a cluster of four 6 x 6-inch timber posts. Traditional Japanese architecture inspired the market structure: repetition is the logic of the roofing system, and the design serves both structural and architectural needs. (The Tree Project, 2016)

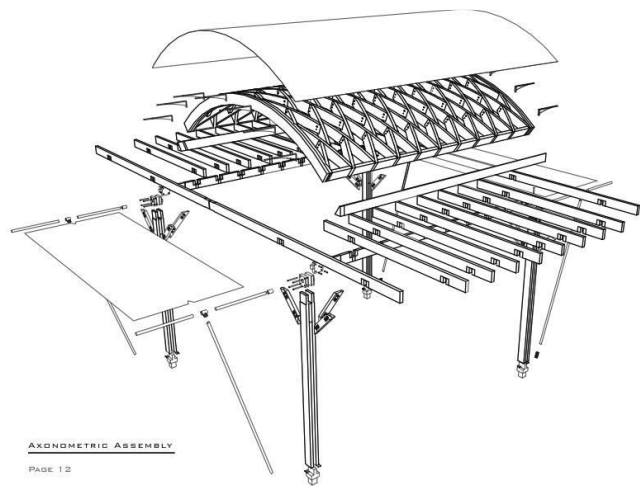


Figure 92: Stall construction



- | | |
|---|---|
| <p>1. Entry Plaza</p> <p>2. Sculpture</p> <p>3. Planting Beds</p> <p>4. Main House</p> <p>5. Community Garden</p> <ul style="list-style-type: none"> • Gathering place • Shelter • Variety size block • Green wall <p>6. Picnic Area</p> <p>7. Carriage House</p> <p>8. Herb Garden</p> <p>9. Community Gathering</p> <p>10. Silos</p> <p>11. Sitting Area</p> | <p>12. Open Lawn</p> <ul style="list-style-type: none"> • Community gathering • Multi-field • Outdoor yoga • Show/stage • Outdoor food • Shelter <p>13. Visitor Center</p> <ul style="list-style-type: none"> • Restaurant/Cafe • Sculpture • Museum (History display) • Gift shop <p>14. Farmers Market</p> <ul style="list-style-type: none"> • Seating area • Tree canopy • Lightings • 30ft pathway • Movable table and chairs <p>15. Parking Lots</p> <ul style="list-style-type: none"> • East Side - 25 stalls w/ 2 handicap included • South Side - 29 stalls w/ 2 handicap included |
|---|---|



Figure 93: Plan of Bryan Urban Farmer's Market

Source: *The Plan Journal*

3.5.4. Inferences

The inferences drawn from the Bryan Urban Market on the basis of the conclusion and major findings from the literature reviews:

Table 14: Inference from Bryan Market

4 Realms of farmers' market	
Market Realms	Elements
1. Promenade	30' pathway, entry plaza
2. Working Market	Restaurant/café, Museum, Gift shop, Permanent market pavilions; 8 x 12 feet of vendor space, 54 parking spaces
3. Market Landscape	Seating Area, Picnic Area, Open lawn, Herb garden, Silos, lightings
4. Market Neighborhood	Downtown Urban neighborhood, two historic structures in proximity
Attributes of Public Space	
Attributes	Indicators
5. Accessibility & linkages	Universal access, high visibility, within a urban neighborhood
6. Uses and activities	Multiplicity of activities; shopping, recreation, food, relaxation, community gathering space, yoga, museum visit
7. Comfort and Image	Greenery, Pavilions, seating, historicity, attractive space
8. Sociability	Opportunities for interaction; gathering place, interactivity, Street Life, Evening Use

REGIONAL CASE STUDY

3.6. Dilli Haat

Dilli Haat is a popular destination for both tourists and locals alike, offering a vibrant and colorful atmosphere to experience India's diverse culture and cuisine. The market features around 200 stalls and shops that sell a wide variety of goods, including textiles, jewelry, pottery, wood carvings, and other handicrafts.



Figure 94: Dilli Haat

Source: <https://www.archohm.com/dilli-haat-delhi.html>

3.6.1. Introduction

Location: Janakpuri East, New Delhi, India

Year of construction: 2014

Client: Delhi Tourism and Transportation Development Corporation

Climate: Composite climate

Site Area: 32375 sq. m.

Built-up Area: 16000 sq. m.

Selection Criteria

- Market designed as a vibrant public space
- Designed to be in tune with today's times and respecting the craft and cultural centrality of the project. conservation between the past and the present, acknowledgement of the traditional and its adaptation in contemporary times

3.6.2. Description

Free-flowing open spaces bind various activities on two levels. A large open space takes the visitor through a frisking area to another pocket that leads to the huge central plaza formed by meandering. Air-conditioned shops and exposition halls. The open pedestrian ramp leads to the terraces lined by canopy shops. From the frisking area, there are direct access points to the café, surface and basement parking and banquet greens. The central plaza culminates to the auditorium and the craft shops cluster. The most popular activity that is the craft shop clusters located at the rear end to enable the visitors to walk through the entire haat. Another frisking area is located near these clusters since there is strong possibility of crafts shops to become the predominant function. The four 8m high towers are interspersed along the site.

It bonds the overall functional program of formal and informal shops to sell crafts and celebrate culture with an underlying layer of music as a theme. The haat had to be in tune with today's times and respecting the craft and cultural centrality of the project. The design is therefore a conservation between the past and the present, acknowledgement of the traditional and its adaptation in contemporary times, in concept and in construction. To make the haat a functionally viable space, it was decided to give a music theme to the center. A state-of-art auditorium that can hold large music concerts, an Amphitheatre, a music center for sales and exhibition of musical instruments along with inviting exuberant of building musicians and music lovers. (Archohm, 2015)

The Market has been designed in three levels:

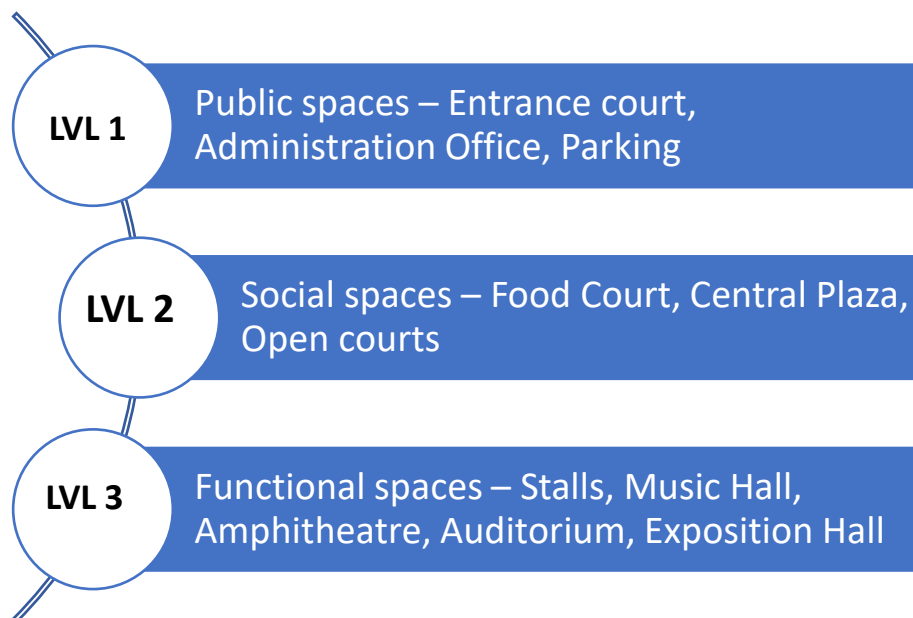


Figure 95: Illustration Showing Level of Dilli Haat

Source: (Archohm, 2015)

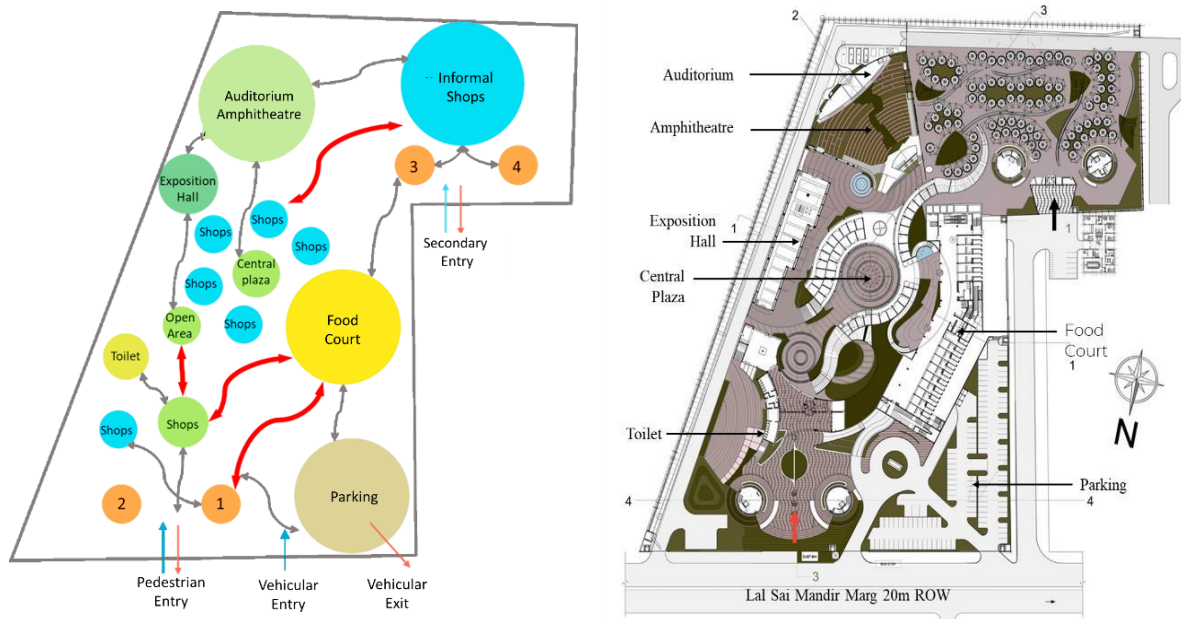


Figure 96: Plan of Dilli Haat

Source: Archohm, 2015

3.6.3. Concept

- The haat had to be in tune with today's times and respecting the craft and cultural centrality of the project. The design is therefore a conservation between the past and the present, acknowledgement of the traditional and its adaptation in contemporary times, in concept and in construction.
- To make the haat a functionally viable space, it was decided to give a music theme to the center.
- A state-of-art auditorium that can hold large music concerts, an Amphitheatre, a music center for sales and exhibition of musical instruments along with inviting exuberant of building musicians and music lovers. (Archohm, 2015)

3.6.4. Planning

- Free-flowing open spaces bind various activities on two levels.
- A large open space takes the visitor through a frisking area to another pocket that leads to the huge central plaza formed by meandering Air-conditioned shops and exposition halls.
- The open pedestrian ramp leads to the terraces lined by canopy shops.
- From the frisking area, there are direct access points to the café, surface and basement parking and banquet greens.
- The central plaza culminates to the auditorium and the craft shops cluster
- The most popular activity that is the craft shop clusters located at the rear end to enable the visitors to walk through the entire haat.
- Another frisking area is located near these clusters since there is strong possibility of crafts shops to become the predominant function.
- The four 8m high towers are interspersed along the site. (Glory, 2020)

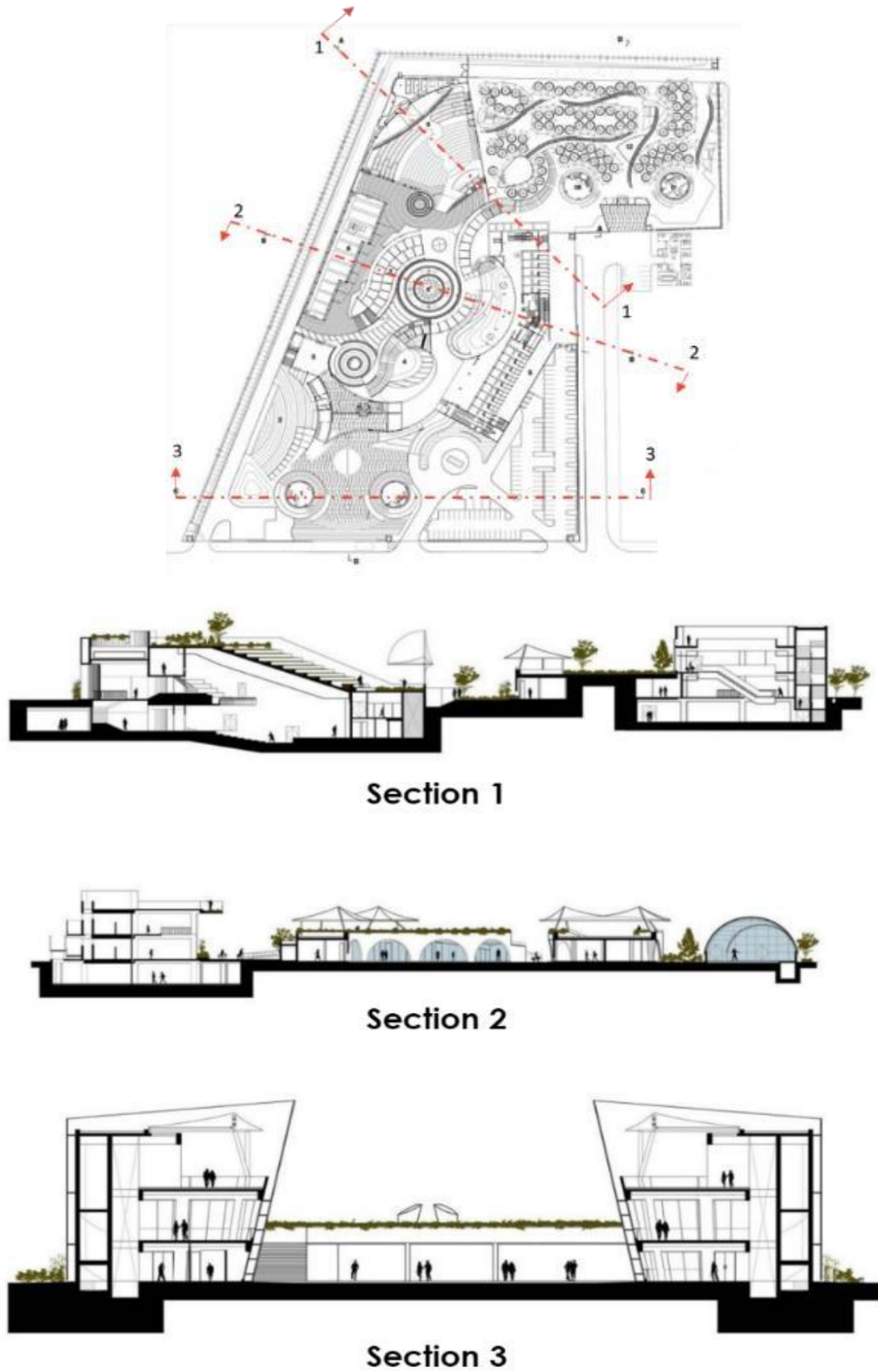


Figure 97: Section of Dilli Haat

Source: Archohm, 2015



Figure 98: Longitudinal Section of Dilli Haat

Source: Archohm, 2015

Conception of the program is as large a design intervention as its physical manifestation.

The final functionality found area as follows:

- An indoor, well-equipped, 800 capacity auditoriums for formal concerts,
- An informal open-air amphitheater that works simultaneously with independent spaces and support services.
- A multipurpose, multiscale exposition hall for exhibitions and seminars.
- A set of four baskets houses a music store and music workshop space along with tourism offices and cafes.
- A large food court extends into shaded courtyards and expansive greens for the basic need of spill overs.
- Formal, informal and open shop spaces are created to bring in the required sensitive adaptations of malls, markets and bazaars into this haat.
- An independent fine dining with an extended banquet facility is created to reinforce the business plan of this complex cultural complex. (Archohm, 2015)

3.6.5. Materials used

- Breaking free of the conventional look and feel of its other two counterparts with their brick vocabulary, Dilli Haat, Janakpuri takes a fresh look at the material palette as demanded by the multifaceted program that it houses.
- The material spectrum is an eclectic mix of modern and traditional.
- Using the timeless red Agra stone, kota stone, slate and the local Delhi quartz stone masonry on facades and landscapes sets a neat and natural typology to this predominantly green complex.
- Bamboo is extensively used – structures for shading, screens for baskets and food court, sculptures for street furniture on one side and the natural growing ones as softscapes of boundary plantations and accent trees on the other. (Archohm, 2015)

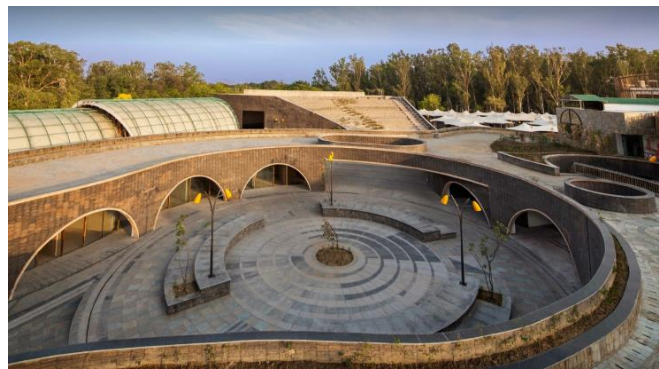


Figure 99: Spaces inside Dilli Haat

Source: Archohm, 2015

3.6.6. Program Extraction

Programmatic schedule of Dilli Haat

- **Site Area:** 3.92 hectare (32375 sq.m)
- **Ground Coverage:** 27.88%
: 9028 sq. m.
- **FAR:** 39.98%
: 12925 sq. m.

Table 15: Program Extraction of Dilli Haat

Building	Type	Number	Area
Circular Shops	Type 1	95	9.62 m ²
	Type 2	05	7.6 m ²
AC Shops	Type 1	01	42.10 m ²
	Type 2	15	17.20 m ²
	Type 3	22	16.18 m ²
	Type 4	04	15.40 m ²
	Type 5	04	07.70 m ²
Platform shops	-	85	
Food Court	-	48	16.50 m ²
	-		11.65 m ² (kitchen) 10.65 m ² (Courtyard)
Café	-	01	256.56 m ²
	-		10.6 m ² (courtyard)
Basket Tower	-	04	260 m ²
Exposition Hall	-	01	960 m ²
Auditorium	-	01	800 seats
Amphitheatre	-	01	806 seats
Parking	Bus	03	
	4 – Wheeler	292	
	2 – Wheeler	120	
Toilet	-	05	

3.6.7. Inferences

The inferences drawn from the Delhi haat Market on the basis of the conclusion and major findings from the literature reviews:

Table 16: Inference from Dilli Haat

4 Realms of farmers' market	
Market Realms	Elements
1. Promenade	Free flowing open spaces binds the various activities
2. Working Market	Formal market surrounding the central plaza, informal circular market developed to be a frisking area
3. Market Landscape	Green spaces run along the promenade giving the direction to the pathways
4. Market Neighborhood	Flanked by a busy road on the front while sides have a bus depot and prison greens
Attributes of Public Space	
Attributes	Indicators
5. Accessibility & linkages	2.6 km from nearest metro station, 1.2 km from nearest bus stand, universally accessible design, segregation of pedestrian and vehicular
6. Uses and activities	Multiplicity of activities; shopping, recreation, food, relaxation, community gathering space, yoga, museum visit
7. Comfort and Image	Aesthetic masterpiece, pocket spaces for relaxation and hangout, landscape furniture, Amphitheatre
8. Sociability	Dynamic shopping experience, socially interactive spaces, planning favoring social cohesion and catalyst to triangulation process

3.7. Comparative Analysis

The case studies were compared on the basis of the inferences drawn so as to come up with the conclusion for the design. It was identified that the market landscape and market neighborhood are not given as much attention in context of Nepal as compared to international market. Also, the place making attribute is also somehow well thought of in the international market which seems to have been lacking in local context.

3.7.1. 4 Realms of Market

Table 17: Comparative Analysis of Case Study as per the Realms of Market

REALMS	KALIMATI FRUITS AND VEGETABLE MARKET	SURYAVINAYAK HARIT KRISHI THOK BAZAR	LE-SHERPA FAMER'S MARKET	DILLI HAAT	DAVIS FARMER'S MARKET	BRYAN FARMER'S MARKET
PROMENADE	6' circulation corridor, more intimate circulation in retail market	Promenade of about 20' allowing one-way vehicular circulation to each stall	Intimate promenade of about 4' - 5' favoring social interaction	Free flowing open spaces binds the various activities	14-foot-wide promenade has an I-shaped configuration within the pavilion, extends past the pavilion to accommodate seasonal market expansion.	30' pathway, entry plaza
WORKING MARKET	Market stalls each of area 80 sq. ft., cold stores, storing cages, mesh, bank area, administration and office spaces, holding yards and auction, loading-unloading platform	Market stalls each of area 80 sq. ft., cold stores, storing cages, mesh, bank area, administration and office spaces, loading-unloading platform	Display of products on temporary stalls and kiosks along one side of the promenade, no proper parking	Formal market plaza, informal circular market developed to be a frisking area	Use of angled parking along adjacent streets and provides small storage facility for market signage, an information kiosk, and an open-air pavilion with lighting and utility connections. Sunscreens added along the west side of the pavilion for protection from the afternoon glare	Restaurant/café, Museum, Gift shop, Permanent market pavilions; 8 x 12 feet of vendor space, 54 parking spaces
MARKET LANDSCAPE	Lacks soft landscape and relaxation spaces, only hard pavements and parking area, lacks green and blue features and children play area	Lacks soft landscape and relaxation spaces, only hard pavements and parking area, lacks green and blue features and children play area	Multi-tiered garden, open lawn, relaxation space at center, a greenhouse nursery	Green spaces run along the promenade giving the direction to the pathways	composed of children's play area, great central lawn, rose and butterfly gardens, a mature sycamore grove, a historic carousel, a raised wooden deck encircling a heritage oak tree, and teen center	Seating Area, Picnic Area, Open lawn, Herb garden, Silos, lightings
MARKET NEIGHBORHOOD	Highly dense urban neighborhood, issues of traffic congestion, noise and bad odor to neighborhood, not inclusive to neighborhood culture	Highly dense urban neighborhood,	A tourist area, dense settlement surrounds the market with Shital niwas in its proximity, invites local artisans and producers	Flanked by a busy road on the front while sides have a bus depot and prison greens	includes the University of California Davis, the University Arboretum, the Davis Commons, Aggie Village, the historic town center of Davis with a moderately-scaled retail land-use density with restaurants and cafes.	Downtown Urban neighborhood, two historic structures in proximity

3.7.2. Placemaking

Table 18: Comparative Analysis of Case Study as per Placemaking

Attributes of Public Space	KALIMATI FRUITS AND VEGETABLE MARKET	SURYAVINAYAK HARIT KRISHI THOK BAZAR	LE-SHERPA FAMER'S MARKET	DILLI HAAT	DAVIS FARMER'S MARKET	BRYAN FARMER'S MARKET
Accessibility & linkages	2.6 km away from ring road, accessed through inner city road, lacks universal accesses, controlled entry points not a permeable design approach	150 m away from Araniko highway, accessed main highway, inclusiveness of universal accesses, controlled entry points not a permeable design approach	No proper signage, has a boundary, privately owned, Vehicular and pedestrian access but no provision for disabled	2.6 km from nearest metro station, 1.2 km from nearest bus stand, universally accessible design, segregation of pedestrian and vehicular	Access through main road, inclusiveness of the universal design	Universal access, high visibility, within a urban neighborhood
Uses and activities	Limited to food related procurement, addresses only economic aspects, lacks more engaging activities	Limited to food related procurement, addresses only economic aspects, lacks more engaging activities	Quick service restaurants and eateries, creational spaces, procurement of fresh and unique products, music and other themed activities inviting local artists	Multiplicity of activities; shopping, recreation, food, relaxation, community gathering space, yoga, museum visit	Quick service restaurants and eateries, creational spaces, procurement of fresh and unique products, music and other themed activities inviting local artists	Multiplicity of activities; shopping, recreation, food, relaxation, community gathering space, yoga, museum visit
Comfort and Image	Uncomfortable, issues of sanitary, placelessness, lacks relaxation and seating spaces, over crowded and lacks aesthetic character.	Uncomfortable, placelessness, lacks relaxation and seating spaces, over crowded and lacks aesthetic character.	Greenery, seating spaces over landscape mounds, relaxation spaces, though lacks benches and landscape furniture.	Aesthetic masterpiece, pocket spaces for relaxation and hangout, landscape furniture, amphitheater	Greenery, seating spaces over landscape mounds, relaxation spaces, though lacks benches and landscape furniture.	Greenery, Pavilions, seating, historicity, attractive space
Sociability	Intimate shopping experience and social interaction – vendor customer interaction but people not prefer to socialize here due to unhygienic premise	Intimate shopping experience and social interaction, lack of space for socialization	Local attraction and engaging spaces, unique products favoring more social interaction between vendors and customers, recreational opportunities around the food	Dynamic shopping experience, socially interactive spaces, planning favoring social cohesion and catalyst to triangulation process	Local attraction and engaging spaces, unique products favoring more social interaction between vendors and customers, recreational opportunities around the food	Opportunities for interaction; gathering place, interactivity, Street Life, Evening Use

Component Study

Some component case studies were also done so that it will be easier to understand their features and use it in design. This included biogas implant, Bank and café. These are the supporting facility for the project which directly aids in the betterment of it.

3.8. Biogas Implant

Waste management is one of the major issues in the market of perishable items. About 98% percentage of market waste is organic and has huge biogas potential. Since with the idea of biogas the major problem of the market could be solved and get benefitted by Thus, setting up biogas plant was considered as sustainable and efficient solution to resolve this issue.

Vw2E is a green technology-based company focused on innovative and comprehensive solutions for sustainable municipal solid waste management. Partnering with local communities and government to manage wastes from collection to disposal, we utilize proprietary Anaerobic Digestion technology with the integration of water purification/treatment, gas up-gradation/refinery (Bio-CNG) and waste segregation processes to recover valuable resources and create clean renewable energy.



Figure 100: Waste to energy Plant in Dharan

Source: <https://thehimalayantimes.com/ampArticle/258340>

Location: Panamera, Ward-6, Dharan Sub-metropolitan City

Site Area: Approx. 22000 sq. m. (4 Ropanis)

Project Type: Waste to Energy Project Through Anaerobic Digestion (Biogas)

3.8.1. Description

Venture Waste 2 Energy (VW2E) is the first Municipal Solid Waste Management project at Dharan Sub-Metropolitan city focused on sustainable growth in renewable energy sector. It is a private limited business with the goal of developing a waste-to-energy plant using anaerobic digestion. The purpose of this VW2E is to create environmentally friendly solutions for

processing organic feed waste from any source while also contributing to the country's economic growth. (Venture Waste 2 Energy, 2019)

One of the major products of the project is bio-methane gas which they aim to sell it to the domestic and industrial consumers in Nepal. The project aims to manage municipal solid waste from Dharan Municipality and use organic waste as energy source through Anaerobic Digestion. The capacity of the plant is **30 TDP (Ton per Day)**.

This project is using the **SERI Organic Fuels Technology** which is a multi-stage variable hydraulic and solid retention, microbe incubated Bio-Reaction system. This technology uses the “microbe incubated Bio-Reactors (MIBR) with stabilized incubation system and laboratory cultured feed specific microorganisms and related biotechnology and fast breeder media”. This technology can process any organic feedstock like fruits and vegetables waste. Not only organic feedstock, it also processes agricultural waste, oil effluents, poultry and fish remain etc. One of the major advantages of this technology is that it processes 100% of waste processed.

The output of this projects is biogas, organic fertilizer, pest repellent and recycling scraps. The information provided above are all based on the Detail Project report submitted by Venture Waste to Energy P. Ltd to Office of Investment Board. (‘Integrated Solid Waste Management Project’, 2019)



Figure 101: Organic waste being converted into energy

Source: @the record

3.9. Bank

A bank is a financial institution licensed to receive deposits and make loans. There are several types of banks including retail, commercial, and investment banks. In most countries, banks are regulated by the national government or central bank. Bank was considered as a component for the project as bank can be used by the farmers (vendors) to deposit their daily earning and manage their finance. The site is in the core area of the town public can easily access to the bank.

3.9.1. Jyoti Bikash Bank Limited

The bank is located in new road, Kathmandu. Majorly the working method and the minimum requirement for the bank was studied. This bank was selected as it is newly constructed, and it will be easier to understand the new and updated way of banking facilities.



Figure 103: Jyoti Bikash Bank Limited

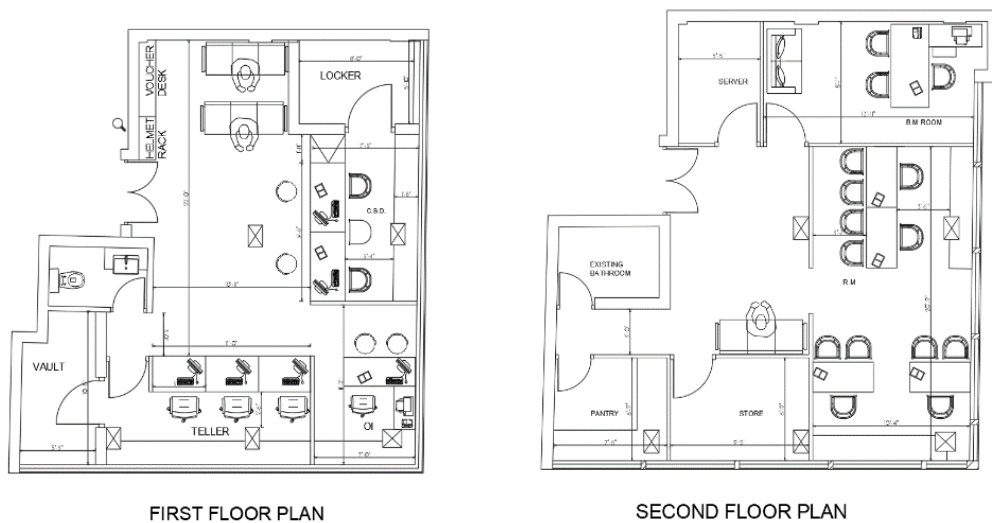


Figure 102: Bank Floor Plan

3.9.2. Inferences

Majorly the arrangement of the spaces of the bank was studied. From which the inferences drawn are:

- Teller and vault must be together.
- Customer service desk (CSD) must be near and clearly visible from the entry.
- Locker and Vault can be together.
- Teller and CSD back cabinet must be at least 20” deep and 33” high.
- Vault is where cash and valuable documents are stored. Accessibility to the vault is only authorized to the teller and other associated staffs.
- Both vault and locker are 3’6” wide. Also, the entry to them should be at least 3’ wide.
- Locker is a facility for the general public accessible by the clients for storing their valuables like jewelry, documents, etc.
- Clients have no authority to enter inside the teller section.
- Vaults and lockers are generally kept adjacent to each other for saving cost due to shared walls.
- Banking hall is the waiting area for the teller.

These are the most followed space arrangement for the proper functioning of the bank.

3.10. Café/ Restaurant

Since the idea is to create the market that goes connecting it with public spaces café / restaurant seems to be an important component of the project. Also, the vendors can also use the café and restaurant and restaurant uses the produce from the market itself.

3.10.1. Zen Bistro and Café

Zen Bistro and Café located in Bansbari, Kathmandu was studied. This café has both fine dining and the café. It has capacity of maximum 200 and is constructed in modern style with the touch of traditional material.

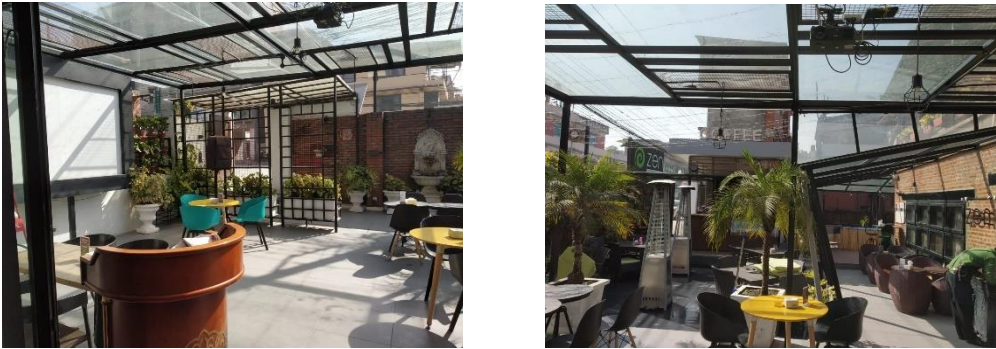


Figure 104: Zen Bistro and Cafe Dining View

The plan shows the circulation and space management of the restaurant. Here the service area and public area has been properly separated and also different types of dining area has been provided.

Features:

- Semi-open Dining
- Bar
- Café + Fine Dining
- Live Music
- Separate entry for Service and Guests
- Parking: Isolated from Restaurant Area
- Space Ambience

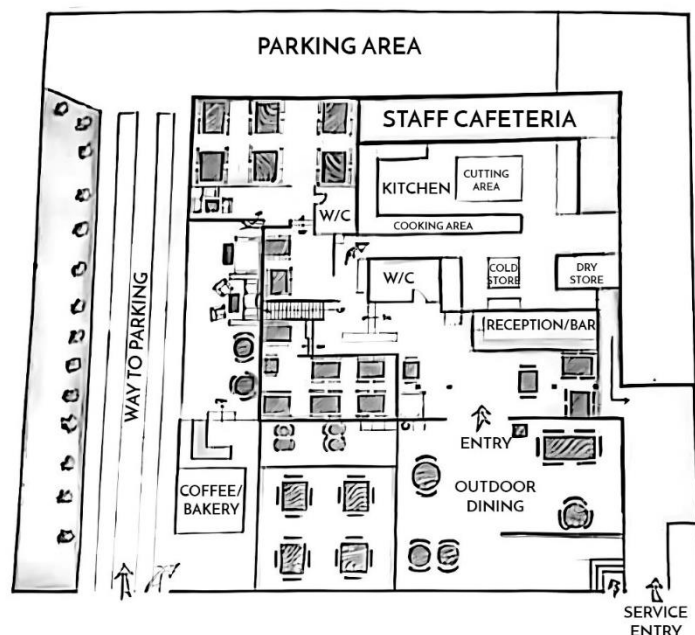


Figure 105: Schematic Plan of the cafe

3.10.2. Inferences

The basic plan layout of the restaurant was understood from the case study.

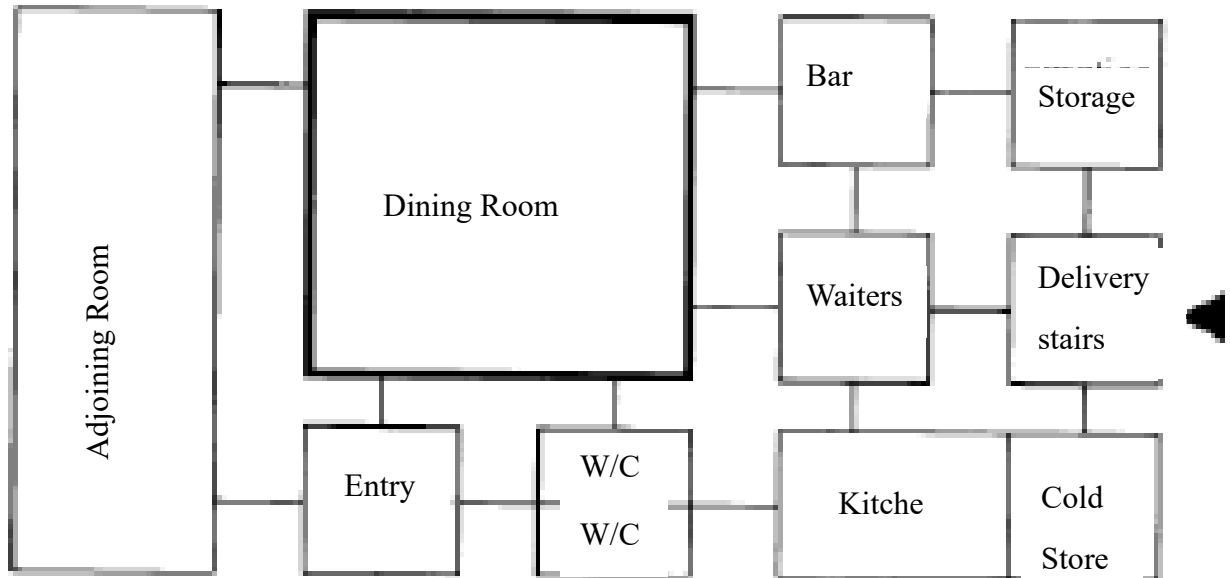


Figure 106: Basic Plan Layout of Restaurant

4. SITE ANALYSIS

4.1. Site Selection Criteria

There are various criteria for site selection which were implemented and used as a means to judge the potential of sites. It would have direct impacts on the design and architectural implications for the center.

- Visibility. Can people see the farmers market from a distance?
- Customer accessibility. Is the market easy for customers to get to, and to get in and out of?
- Farmer and truck accessibility. Is there enough space for trucks to get in and out, turn around the site, and for farmers to set up their displays?
- Blend with community infrastructure. Will local traffic patterns accommodate the flow of traffic in and out of the farmers market?
- Will the market blend in with the community?

Other considerations:

- Centralized location. Is there activity or potential for activity around the market site?
- Public transportation. Are there bus or train stops nearby?
- Highway access. Is it easy for farmers to get to?
- Water Facility. Is water available to wash and cool produce?
- Shade/shelter. Is there any protection from the weather?
- Cost. Is it expensive to use the space?

4.2. Site Introduction

The site is located in Adarsha Chowk, Bhaktapur. It covers an area of approximately 50ropani. The site is accessible directly from the Araniko highway and also is connected to the secondary road as well. Currently the site is being used as farmer’s Market itself namely “Surya Vinayak Harit Krishi Thok Bazar”



Figure 107: Project Site

Source: Google Earth

Location: Adarsha Chowk, Bhaktapur

Access: 8m (150m away from Araniko highway)

Current use: Used as market (Surya Vinayak Harit Krishi Thok bazar)

Topography: Fairly Flat

Location: 27° 66' 51.04" N, 85° 43' 16.76" E

4.3. Site Selection

During the course of my case study in Surya Vinayak Harit Krishi Thok Bazar I realized that the site was perfect for it to be a farmer's market. Understanding the farmer's preference in the choice of convenient market point, Surya Vinayak seems to be very convenient for the farmers from Bhaktapur. Bhaktapur have good agricultural productivity. People here are concerned over the preservation of agricultural lands. Concepts of commercial agriculture and defragmentation of agricultural is also begun to explore. Bhaktapur have very good possibilities for farmers market as it possesses ideal connectivity of producers and consumers. But as produce are taken to Kalimati from Bhaktapur for wholesale and the same produce is brought by retailer of Bhaktapur from Kalimati. This vegetable market in Bhaktapur hence will be very beneficial for the farmers.

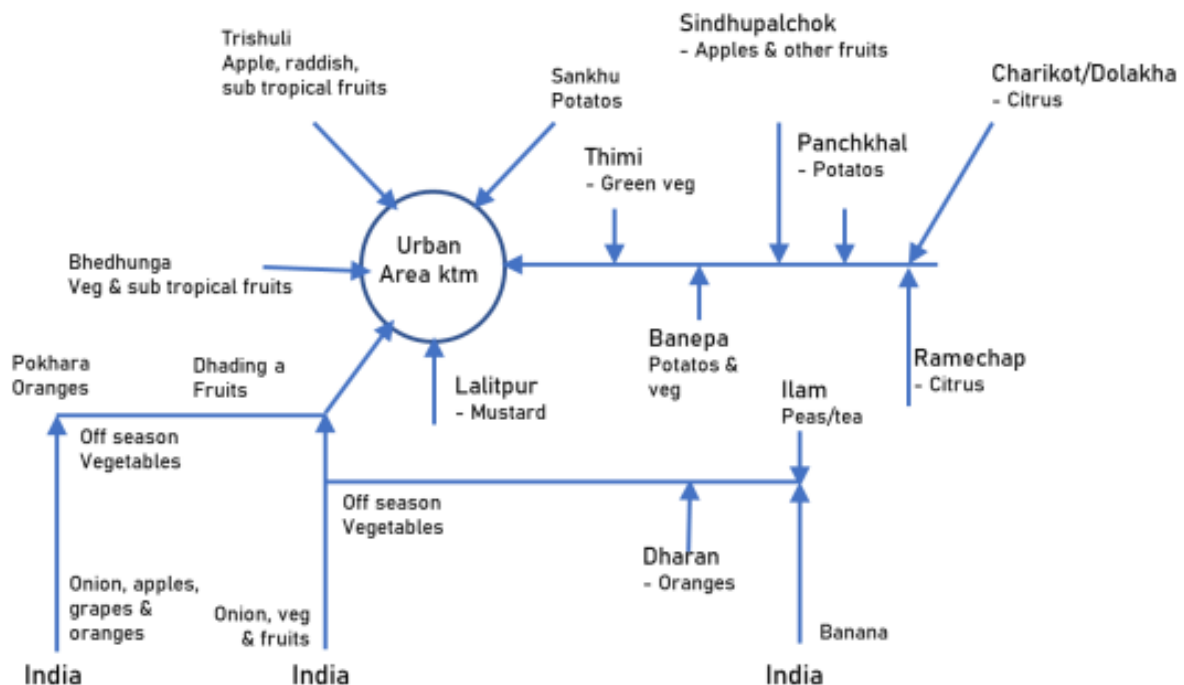


Figure 108: Illustration showing import of products to the Kathmandu valley

Source: Banskota, M., 1989

Besides when the produce from district like kavre, sidhupalchwok, Dolakha, Ramechap are taken to Kalimati during transportation of vegetables from outside the valley through the route passing this market, problems such as traffic jams, quarantine checks and strikes occur. The delay sometimes leads the vegetables to perish. Many vegetables are thrown away at wastes that are not edible causing higher losses in production. Consequently, this contributes to lesser supply in Kathmandu market forming shortages in demand for vegetables. So, for the produce from these districts are easier to supply to Suryavinayak than Kalimati and lot of produce won't be wasted. (Dhakal, 2015)

Four major nodes connecting the historic settlement of Bhaktapur to the major roads or highway have the greatest possibilities.

1. Dudhpati (Siddhapokhari)
2. Jagati
3. SuryaVinayak
4. Chyamasigha

As these nodes is anchoring point between the historic and new settlement and is close proximity to the major bus stops, bus terminals and public infrastructures like hospitals. Due to high traffic flow and urban-rural link, these nodes have many formal and informal market and existed as very busy street market outside the core Bhaktapur. Out of these four nodes, SuryaVinayak is the one with the greatest market possibilities in near future. SuryaVinayak is the point connecting the way to Banepa, Kathmandu and Bhaktapur. SuryaVinayak possesses great future possibilities as many governmental developmental projects are proposed in the Bhaktapur with SuryaVinayak at the center of the proposals.

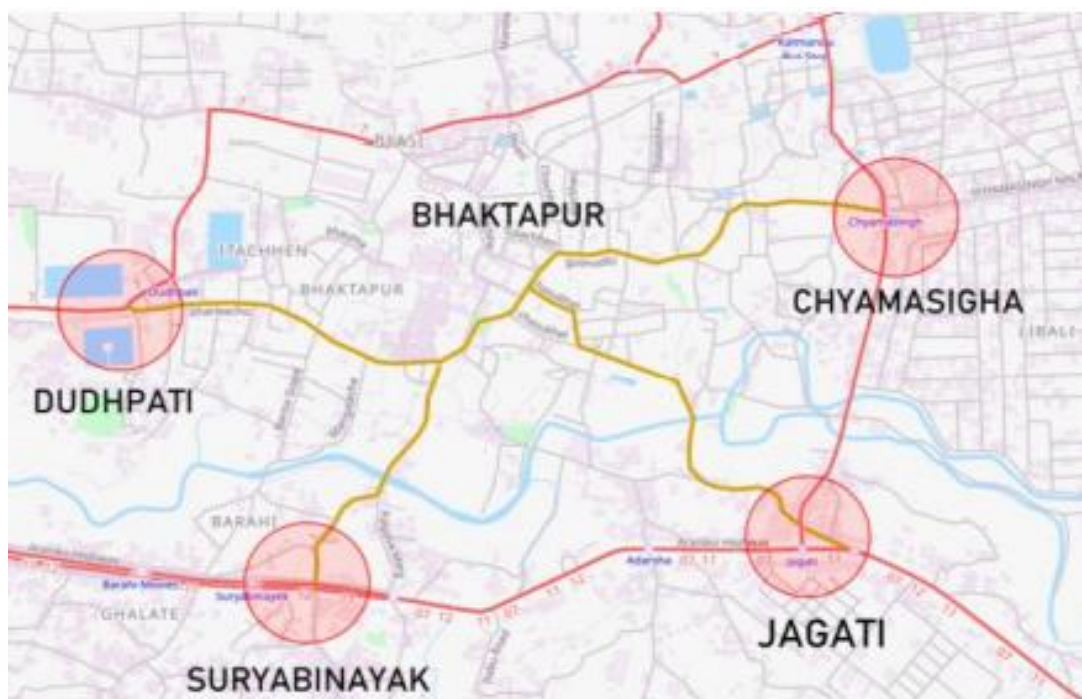


Figure 109: Possibilities of Market in Bhaktapur

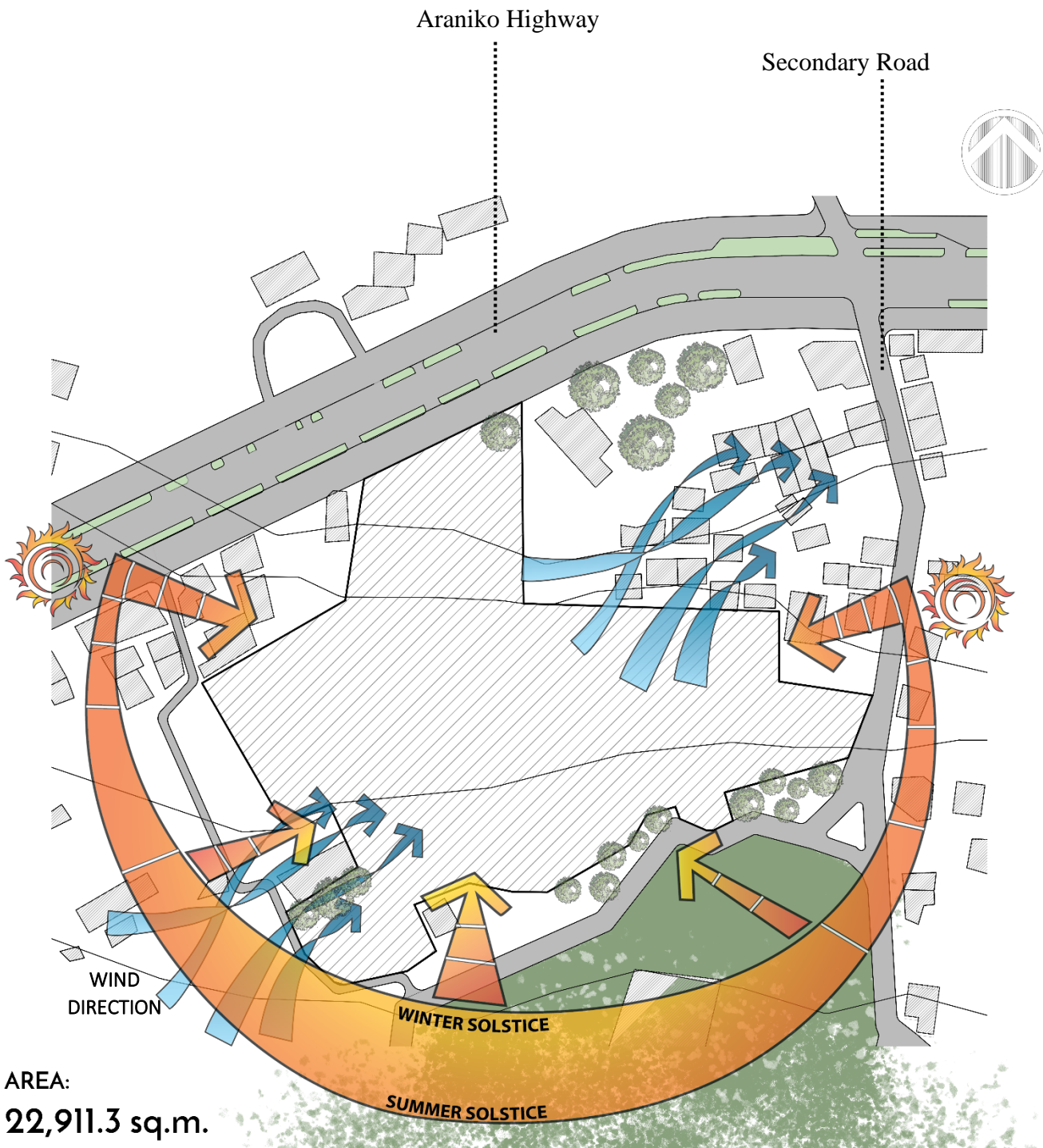


Figure 110: Sun Path and Wind Direction

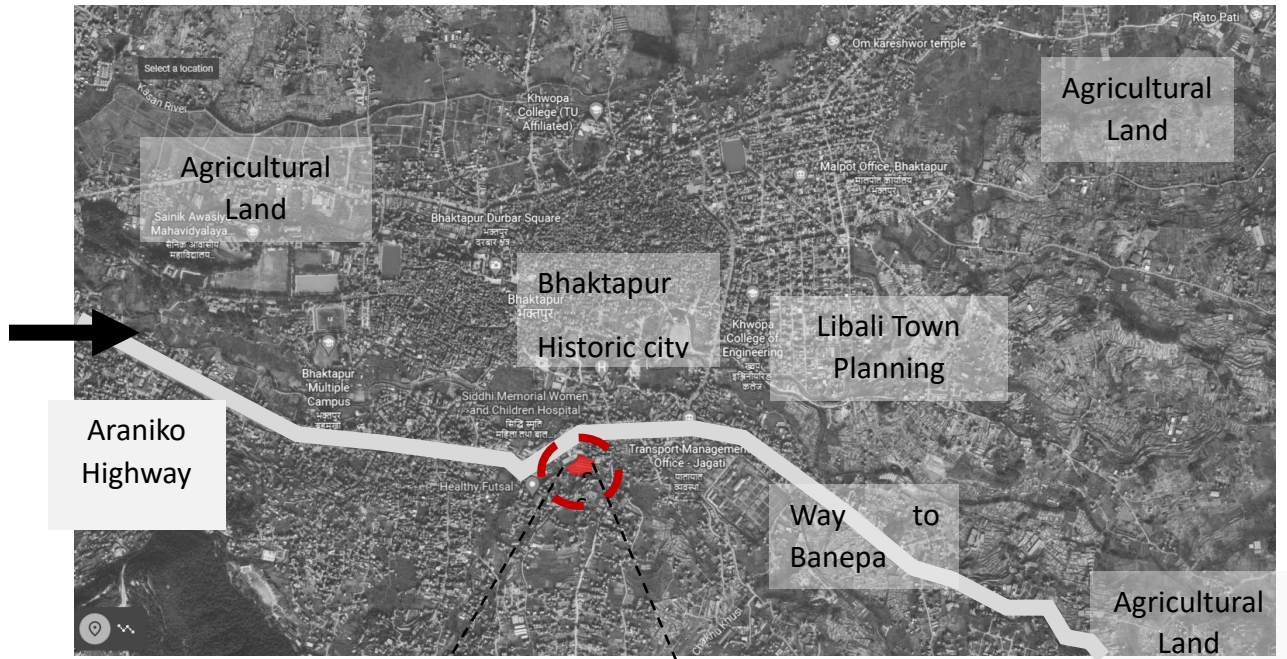


Figure 112: Proposed Site with site Proximity

Source: Google Map



Figure 111: Existing Market in the Site

4.4. Infrastructures

Also, the site is suitable from the infrastructure point of view.

4.4.1. Road and accessibility

It has direct access to Araniko Highway as the primary access. The site is only 150m away from the main highway. The road is route of major vegetable transport as well. Also, government is planning to extend the road as 6 lane road which will aid to the traffic management of the site as well.

Also, the site can be accessible through the secondary road as well which is beneficial for separating the entry and exit of the market for better traffic control.

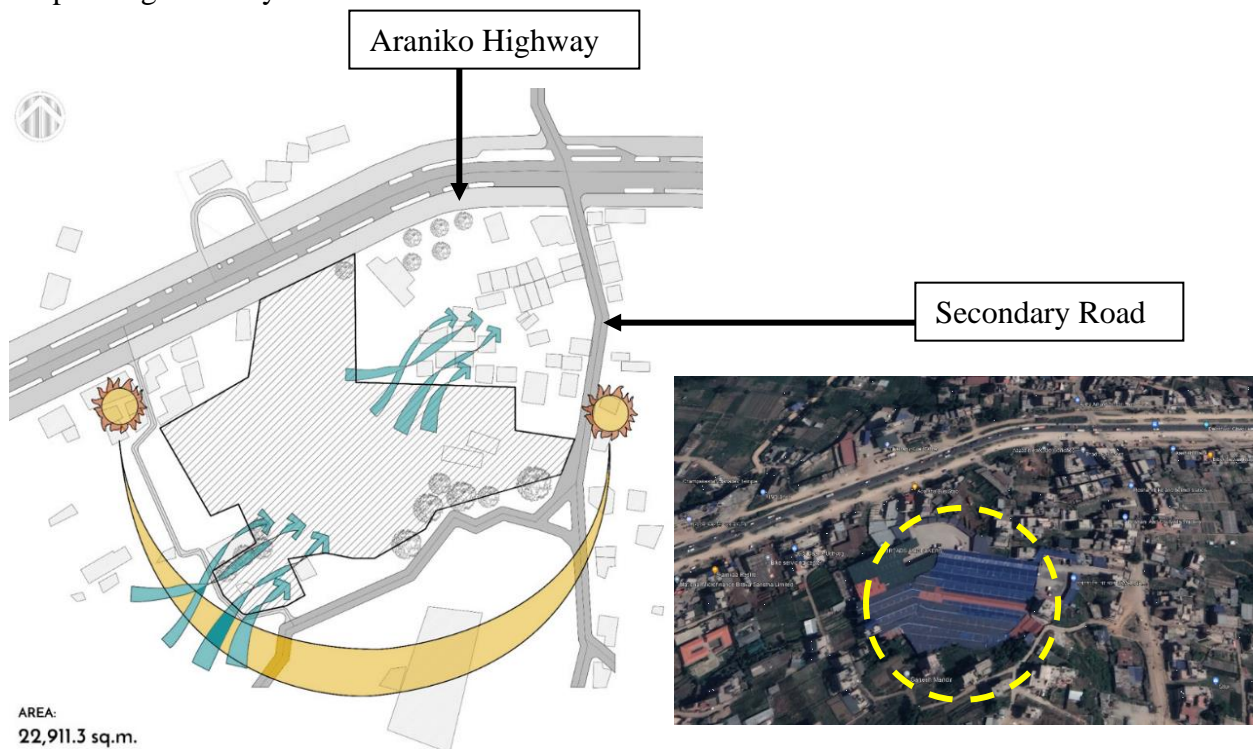


Figure 113: Road Accessibility in Site

Drinking water supply are also easily available here and municipal drainage line through the main roads. NEA three phase line is available for electricity.

However, I also found out that even the site was very feasible for the farmer's market but there were several problems hindering the growth of the market.

4.4.2. Problems

1. Lack of Public Spaces, public space here means the area where the residence around and those who visits the market could get a space for interaction and relaxation that would boost the publicity of the market.
2. Does not Contribute much to the public life of a community.

3. The handling of solid waste is an issue here. A significant amount of solid garbage is produced each day and is simply disposed of carelessly. Since the waste produced is organic, there are many opportunities for the garbage to be reused that have not been considered here.
4. Just huge mass with stalls, could be made more interesting spaces
5. More no. of stalls than required due to which space is being wasted.

Therefore, the main goal in designing this project was to reimagine the market by making the community a key component and giving back to it. The layout of the stalls and the use of contemporary materials combined with better solid waste management would significantly alter the project's overall setting. This location was chosen since the market required some architectural interventions.

4.5. Site Surrounding

Towards the eastern and western side of the surrounding is the residential zone. There is of the Ganesh temple area towards the southern side where lot of picnics, ceremonies take place and that would give a good influx of people and capital to the marketplace. To the northern edge of the side is Araniko highway.



Figure 114: Site Surrounding

Source: Google Earth



Figure 116: Vehicular Parking



Figure 115: Existing Ramp on the site



Figure 118: Residential Zone Towards north-east



Figure 117: Residential zone Towards the east



Figure 119: Entry and Exit gate



4.6. Environment and Climatic Condition

Bhaktapur lies in the Northern Hemisphere. Here the wet season is warm, muggy, and partly cloudy and the dry season is comfortable and mostly clear. Over the course of the year, the temperature typically varies from 37°F to 83°F and is rarely below 33°F or above 89°F. The warm season lasts for 6.2 months, from April 6 to October 11, with an average daily high temperature above 79°F. The hottest month of the year in Bhaktapur is June, with an average high of 83°F and low of 67°F. The cool season lasts for 2.0 months, from December 9 to February 11, with an average daily high temperature below 68°F. The coldest month of the year in Bhaktapur is January, with an average low of 37°F and high of 64°F.

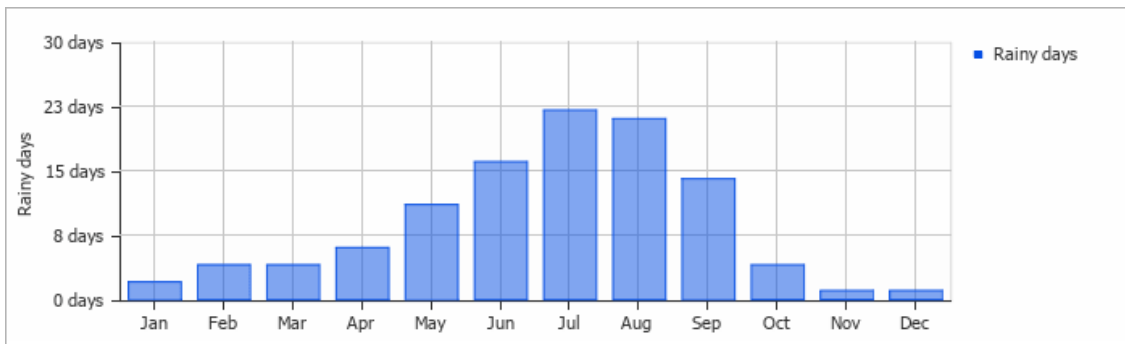


Figure 120: Illustration showing rainfall data of Bhaktapur

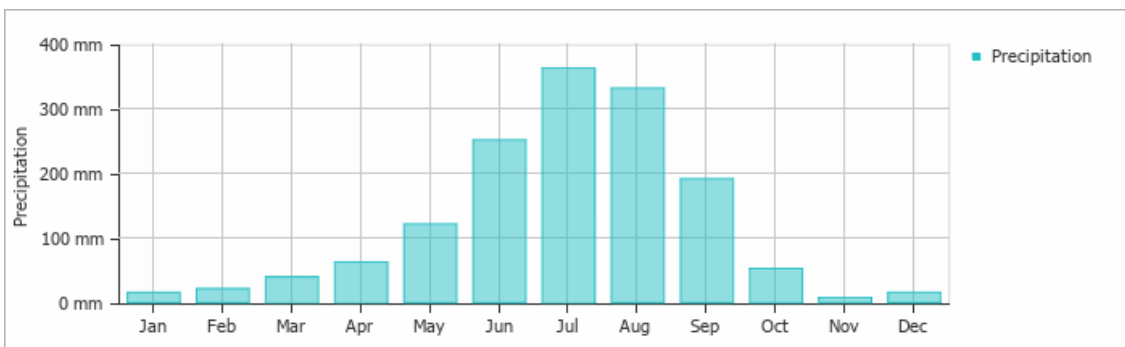


Figure 121: Illustration showing Precipitation in Bhaktapur

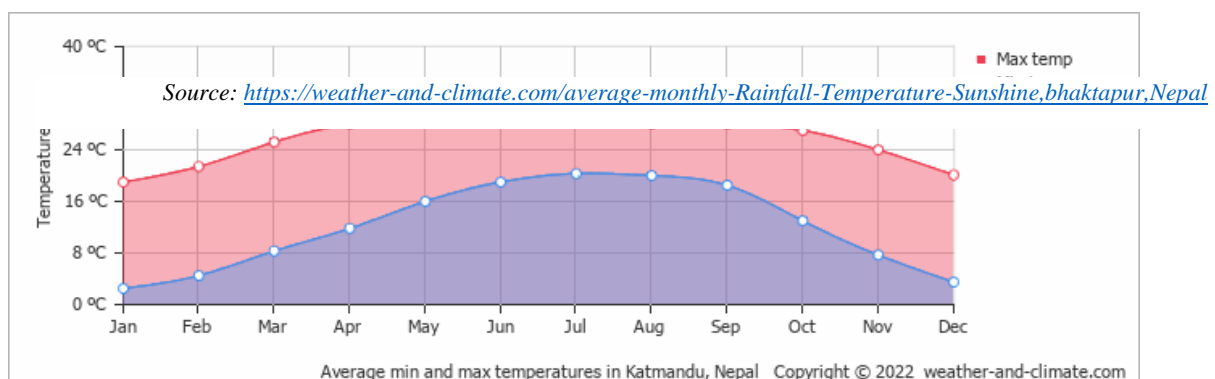


Figure 122: Illustration showing Temperature of Bhaktapur

4.7. Bye-Laws

The site lies in the urban expansion zone and the bye-laws of the site for that zone are as follows:

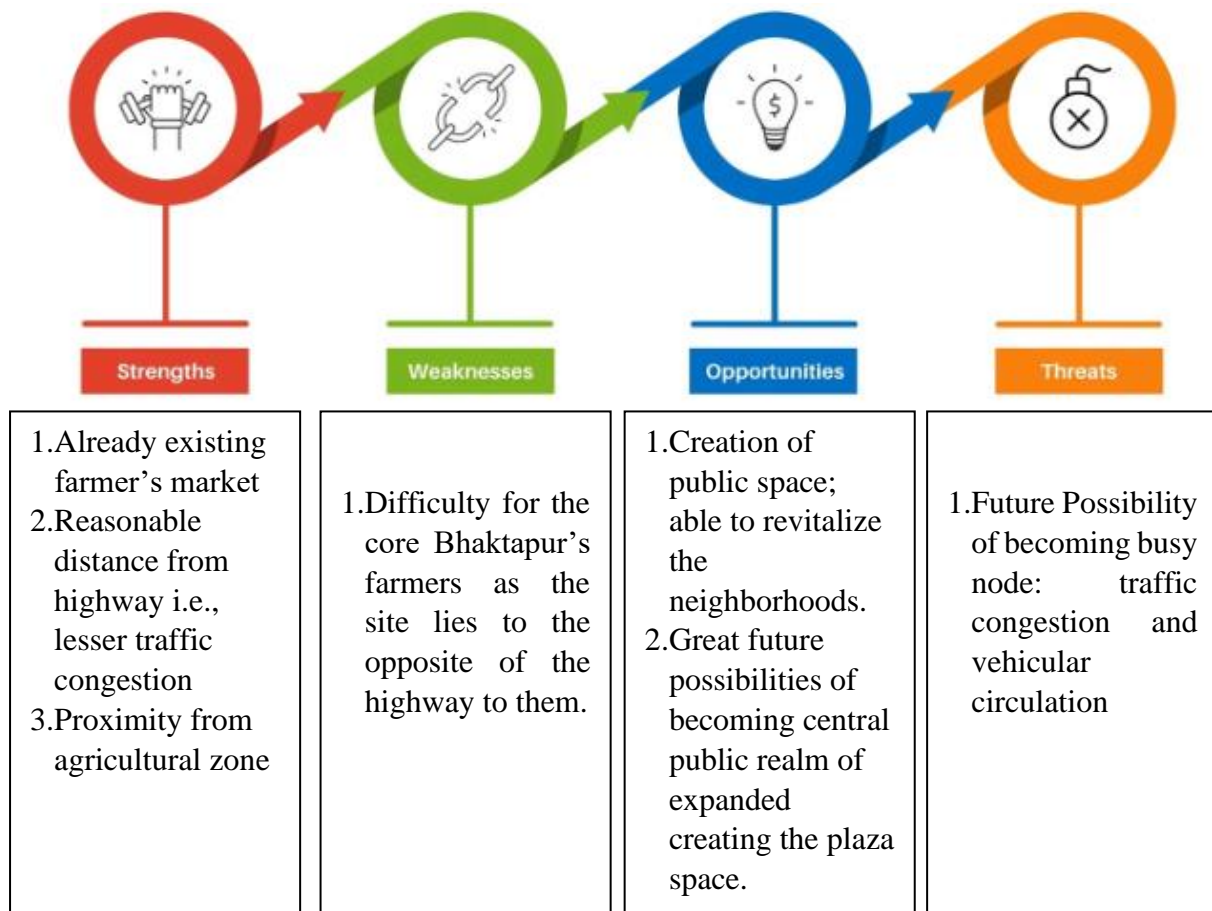
G.C.R.: 40%

F.A.R.: 1.5

Set-Back: 1.5m

Parking: 20% of Site Area

4.8. Swot Analysis



Following the swot analysis, it was determined that the location has excellent visibility from the main highway, which could be taken advantage of as a chance to design a unique plaza space that would appeal to the public and be useful to the neighborhood. Since it would raise market value as well, this immediately improves the market area. The necessity to provide a space for social contact and giving back to the community was recognized, in contrast to the sort of market that now exists and exclusively serves the purposes of buying and selling.

5. PROGRAM FORMULATION

5.1. Site Area Estimation

5.1.1. Expected Population

While designing market in area it is every crucial to understand the demand of the area. The demand can be calculated by the population projection of next decade of the area to be served by the market. The Surya Vinayak Harit Krishi Thok Bazar mainly target the population of Bhaktapur municipality and the surrounding area.

A population projection is a mathematical equation that calculates the estimated growth rate or change of future populations based on current populations. Governments use population projections for planning projects. A simple equation for population projection can be expressed as:

$$P_p = P_o (1 + R)^n$$

Where, P_p = projected population

P_o = population as per recent census

R = annual growth rate in decimal

n = numbers of years

As consulting with the owner of the market the market was established to cater the population of majorly Bhaktapur District but majorly the consumers are from Suryavinayak and Bhaktapur municipality. So, assuming the population of these municipality.

Table 19: Population Data

Municipality	2001	2011
Bhaktapur Municipality	71842	81748
Suryavinayak Municipality	68979.47	78490
Total Population	140821.47	160238
Growth Rate		1.3%
Projected Population		207469.5

(Suryabinayak Municipality Profile | Facts & Statistics – Nepal Archives)

(Source: Bhaktapur Municipality Profile | Facts & Statistics – Nepal Archives)

5.1.2. Per capita Consumption

The total per capita consumption of the fresh produce would be 175 kg/year (fruits = 61, vegetables = 114) as per literary sources.

5.1.3. Consumption Estimation

- An Annual Supply(tons) = Population Served × Per Capital Consumption × 0.001
- Annual Supply (2031) = 36307.1625 Tons

5.1.4. Space Area Calculation

- Turnover Standard for combined urban market = 10-15
- Required Commercial sales area = supply/15 = 2420.4772 sq. m.

5.1.5. Space Area Calculation

- Storage & cold store: 40% of commercial sales area
- Circulation of pedestrians: 10% of commercial sales area
- Offices, management area, Banking, services: 5% of commercial sales area
- Gross Market Area: 3751.73996 sq. m

5.1.6. Site Area Calculation

- 2.5-5 times the market area
- Considering the area factor of 3.5

Therefore, Site Area = 18758.69 sq. m. (Approx. 36 Ropanis)

Separating 4 extra Ropani for parking and Market Landscape so Taking Site area of 40 Ropanis

5.1.7. Detail Program

Based on the literature reviews and case studies following components of the market were identified. The areas are allocated as per the case studies and the standards studied on literature reviews.

Table 20: Detail Program

S. N	DESCRIPTION	NO.	UNIT AREA (SQ.M.)	AREA (SQ. M)	REMARKS
A	STALLS				
1	Permanent				
i	Fruits	50	10	500	
ii	Vegetables	150	10	1500	
iii	Grains	20	10	200	
2	Periodic				
	Total			2200	
	Circulation and Services			880	40% of stalls area

	Total Sales Area			3080	
	STORAGE			1232	40% of Sales area
1	Potato	3			
2	Onion	3			
3	Grains	2			
4	Cold Storage	2	150	300	
5	Others	5	20	100	
	TOTAL			4712	
B	ADMINISTRATION				
1	Reception	1		10	
2	Executive Room	2	12	24	
3	Marketing Manager	1	15	15	
4	Board Chairman	1	15	15	
5	Extension Market Information	1	10	10	
6	Cabins for Technical Staff	5	10	50	
7	Vendor Association Rom	1	50	50	
8	Meeting Hall (1-30)	1	40	40	
9	Food Laboratory	1	50	50	
11	Pantry	1	10	10	
	W/C	3	3	9	
12	Store	1	12	12	
	TOTAL			295	
C	RESTAURANTS				
1	PERMANENT				
i	Restaurant				
	Dining Area	1	180	180	
	Kitchen	1	54	54	30% of Dining Area

	Store	1	10	10	
	Counter	1	20	20	
	Toilets	3	3	3	
	Total			267	
i.	Café	2		120	For 50 people
ii.	Dining Area	1	65	65	
iii.	Kitchen	1	19.5	19.5	30% of Dining Area
	Store	1	6.5	6.5	
	Counter	1	20	20	
	Toilets	2	3	6	
	Total			237	
ii	Small coffee shops, Ice cream parlor, bakeries	10	10	100	
iii	Standalone food kiosks	10	10	100	
	TOTAL			704	
2	Periodic				
	Eateries				
	Live Cooking				
D	CHECK POINTS				
1	Entrance Check	1	20	20	
2	Weighing Bridge	2	60	120	
	TOTAL			140	
E	BANKING FACILITIES				
1	Bank	1	240	240	
2	ATM	2	1	2	
	TOTAL			242	

F	BIOGAS/WASTE DISPOSAL	2	30	60	
	Fertilizer Storage	1	10	10	
	Total			70	
G	RESTROOM				
1	Public	2			
	Male				
	Urinal	3	0.8	2.4	
	w/c	2	1.2	2.4	
	Female				
	W/C	4	1.2	4.8	
	Special	1	9	9	
	Total			18.6	
	TOTAL			37.2	
H	SERVICE BLOCK				
1	Guard House	1	30	30	
2	Changing Room	1	50	50	
	TOTAL			80	
	Grand total			6280.2	
	10% circulation			628.02	
	5% infill walls			125.604	
	5% contingencies			125.604	
	TOTAL BUILT UP AREA			7159.428	

I	Parking				
2unit per 100 m sq. sales area, 52 parking required for sales area of 2520 1-4 parking space for per 4 stalls,					
J	MARKET LANDSCAPE				
1	Central Flexible Space	1			
2	Plaza	3			
3	Play Area	1			
4	Community Garden	1			

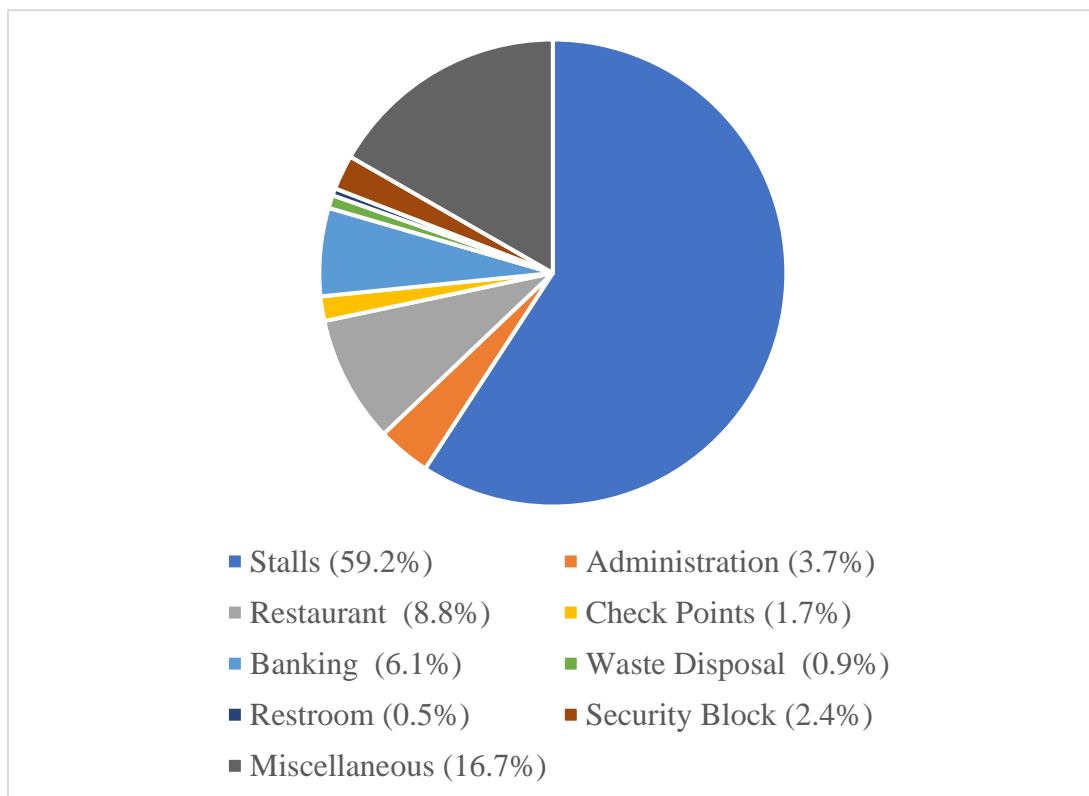
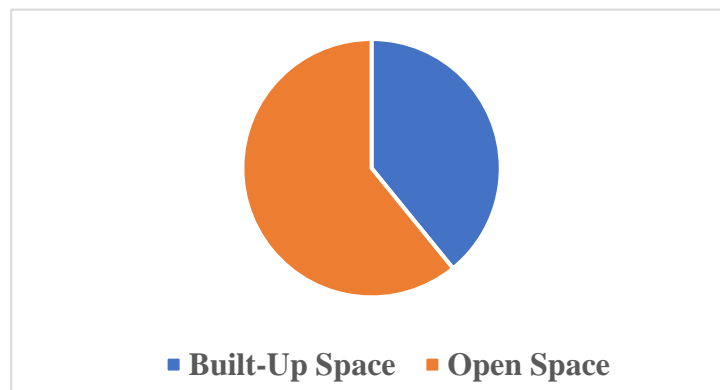


Figure 123: Pie-chart Showing area distribution

6. CONCEPTUAL DESIGN DEVELOPMENT

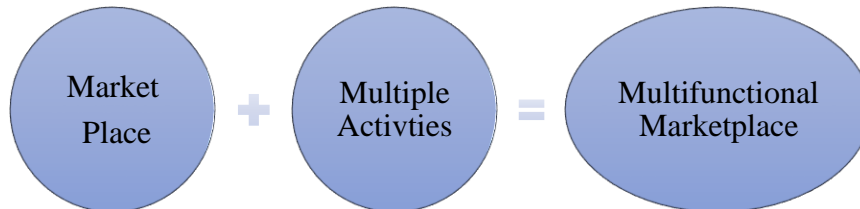
6.1. Introduction

A street market is a marketplace where goods and services are sold by individual vendors or small businesses in an outdoor, public setting. A marketplace is not only a place to buy and sell goods and services, but it also serves as an important social space for individuals to interact with one another. Marketplaces have a long history of being a central hub for community life, where people come together to exchange goods, ideas, and information.

Humans are social creatures. They require social connection, which is the one thing lacking in today's hectic lifestyles. A marketplace, where vendors and buyers frequently engage in animated discussions and bartering over the price and quality of goods, would unquestionably be the ideal setting for the interaction given the current situation. Through these exchanges, people from various origins and cultures might develop stronger social ties and a feeling of community.

In context of Nepal Open Street Markets are the most visible market morphology of our traditional markets, with squares, dabalis, and patis facilitating market functions and a wide range of activities, making it the most people-centric site in a city, town, or village.

The main concept is to establish a multifunctional market that combines the market with various activities in order to "raise the value of the market and improve the interaction between farmers and customers."



6.2. Design Approaches

Since the site with already existing market was chosen for the project, the main intention was enhancing the present state of the markets. For the same at first the state of the market was analyzed, so the first strategy was:

6.2.1. Problem solving approach

6.2.1.1. Visual Connection from the Road

"What attracts people most, it would appear is other people"

-Holly White

The more people a market could draw, the better it would be for the market's overall functionality. When there are people gathered in one place, it is more likely to attract additional people, creating a positive feedback loop of social interaction and energy.

The existing market's primary drawback was that it was disconnected from its surroundings. Although being immediately accessible from the main highway, the facility doesn't have a visible connection to it. So, the plan was to provide a visual connection and inform visitors about the marketplace with plazas, vegetation, and social areas toward the front of the site in order to draw in the attention of the people.

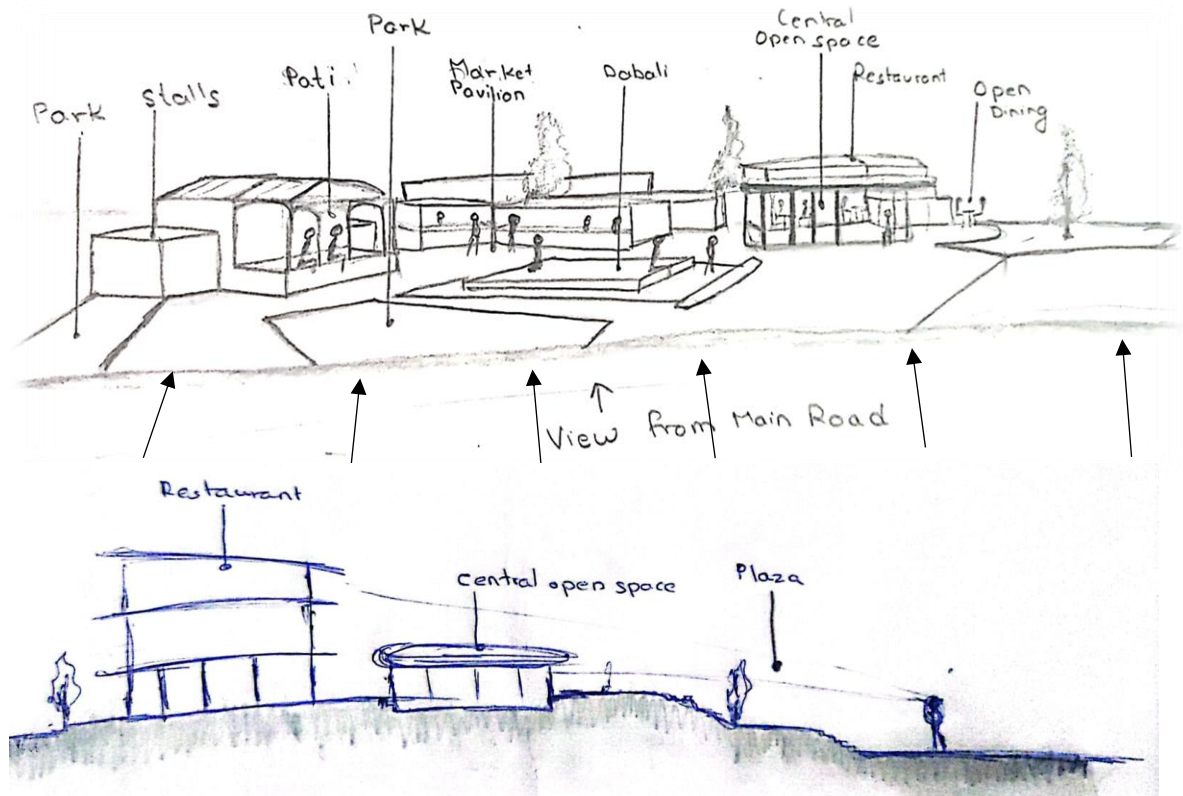


Figure 124: Visual Connection from the road

6.2.2. Space for Public Interaction

Marketplace without the space for social interaction at today's context seems inadequate and boring. It provides very bland shopping experience. The existing market in the site was just a huge mass with stalls and lacks space where people could just sit and relax. To avoid this the approach was to provide the spaces for social interaction as much as possible so that the marketplace would not just remain a place, where customers just come in, buy what they need, and leave but a space for social interaction, to create a more engaging and enjoyable shopping experience.

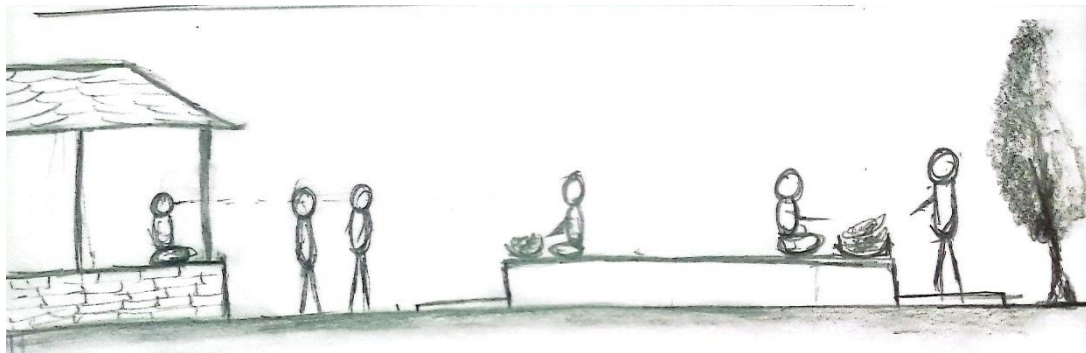


Figure 125: Space for social interaction

6.2.3. Sense of Community

The site that was chosen for the project was in the core area of the Bhaktapur that connected the four major nodes of the town. However, the existing market doesn't provide any communal spaces or say it doesn't blend well with the surrounding. This has led to the market being unable to be connected with the local people or the local vendors.

So, the approach was to give the sense of community through the building. For this replicating the traditional fabric of the valley so that market will be a part of the community. The major inspiration for the project was taken from the traditional Newari alleys (gullies) which acts as the major circulation for most part of the Bhaktapur city. The market flow is also inspired from this concept of providing the feeling of walking through the gullies as you stroll around the market.

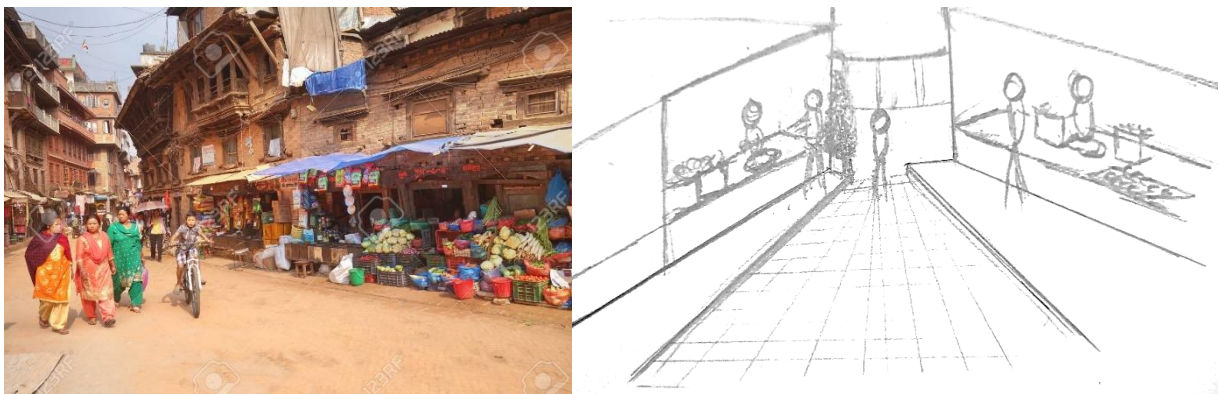


Figure 126: Street-life into Market



Figure 127: Alley to an Open space

6.2.4. Harmonious balance between the old and the new

The design goal is not to imitate the built form of Bhaktapur but to create a harmonious balance between the old and the new, preserving the cultural and historical identity of the traditional fabric while embracing the benefits of modern architecture and engineering.



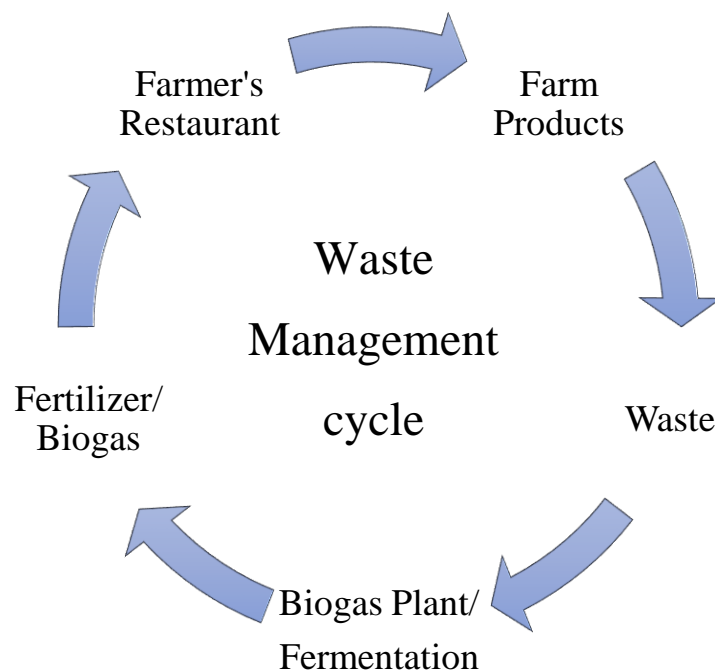
Figure 128: Modern form with traditional fabric

The harmonious balance is maintained by the use of materials (brick pavement, slope roof with jhingati tiles) and stalls that are inspired from the traditional Newari Pati that blends with the curve-built form.

6.2.5. Waste Management Cycle

Waste management is indeed a major issue in markets, especially in areas where there is a high volume of visitors and vendors. Proper waste management is critical for maintaining a clean and hygienic environment in the market

If we see in context of farmer's market 90% of the waste produced is organic which can be turned into fertilizers can returned back to the farmer's or used for biogas and thus creating the waste management cycle.



6.3. Zoning

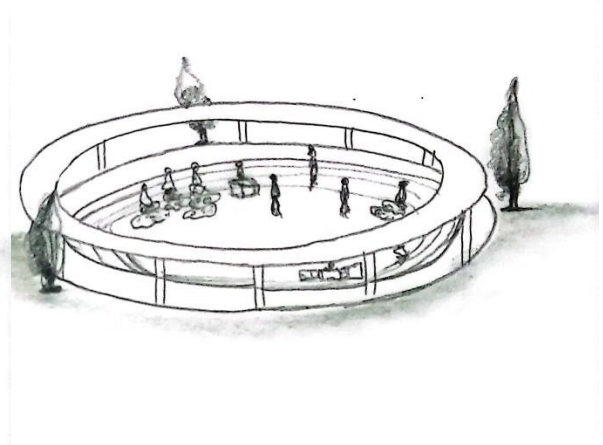
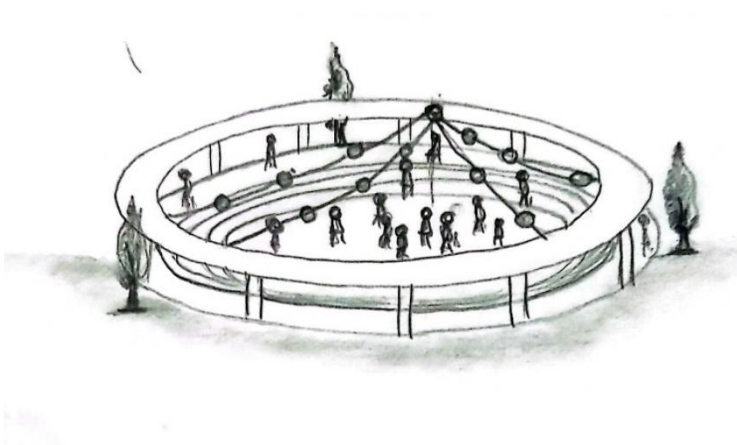
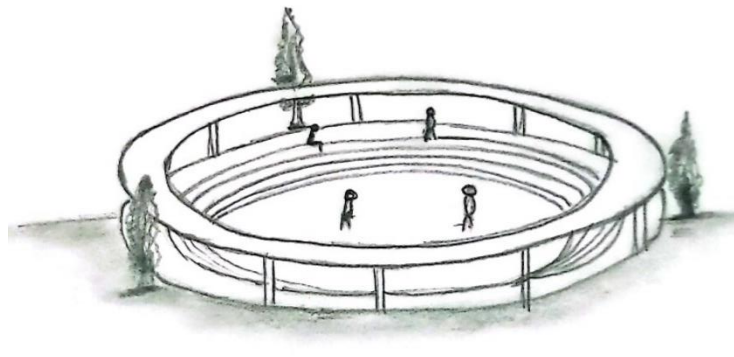
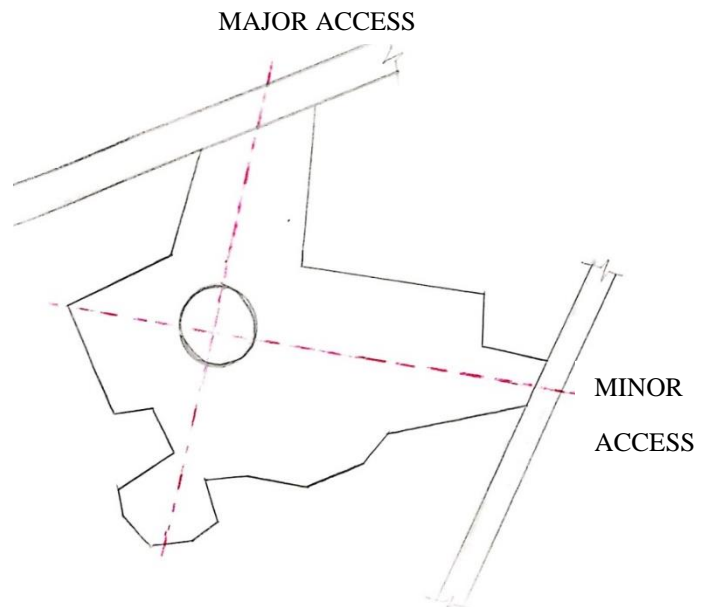
6.3.1. Access and Approach

Araniko Highway runs through the northern edge of the site. The highway further divides into an 8m secondary road which runs through the west of the site. Both the roads connection to the site creates the major and minor access for the site.

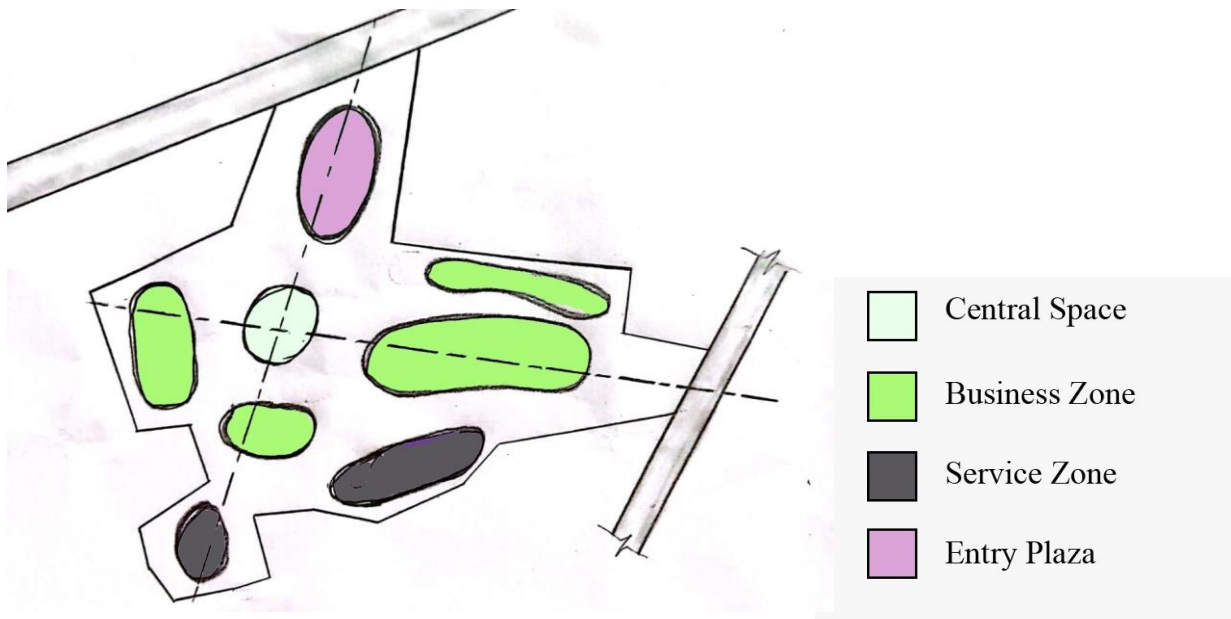
Creating the central flexible space at the intersection point of both accesses.

The central flexible space is provided in a circular form as circle represents the notions of unity, integration, wholeness, and gives a sense of completion, confidence, and harmony.

This space can be used for multifunctional purpose that is the same space can be used just as a open park, can be used as space for community gathering or during various events and festivals, can be used for the periodic market.

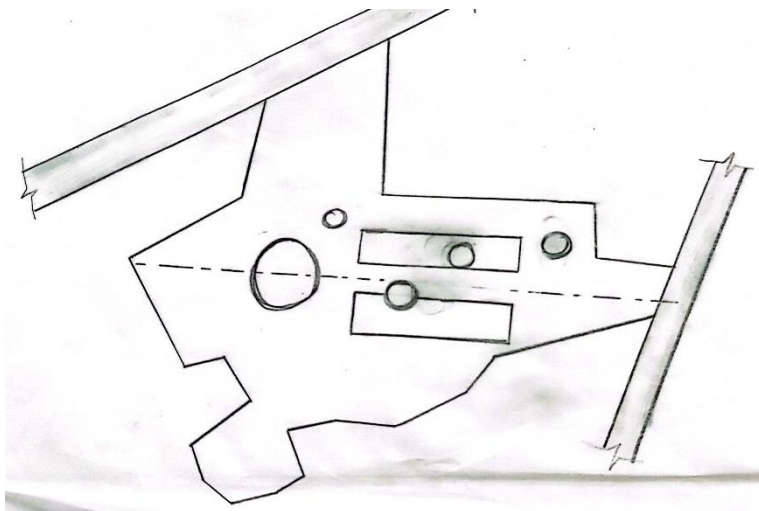


6.3.2. Functional Zoning



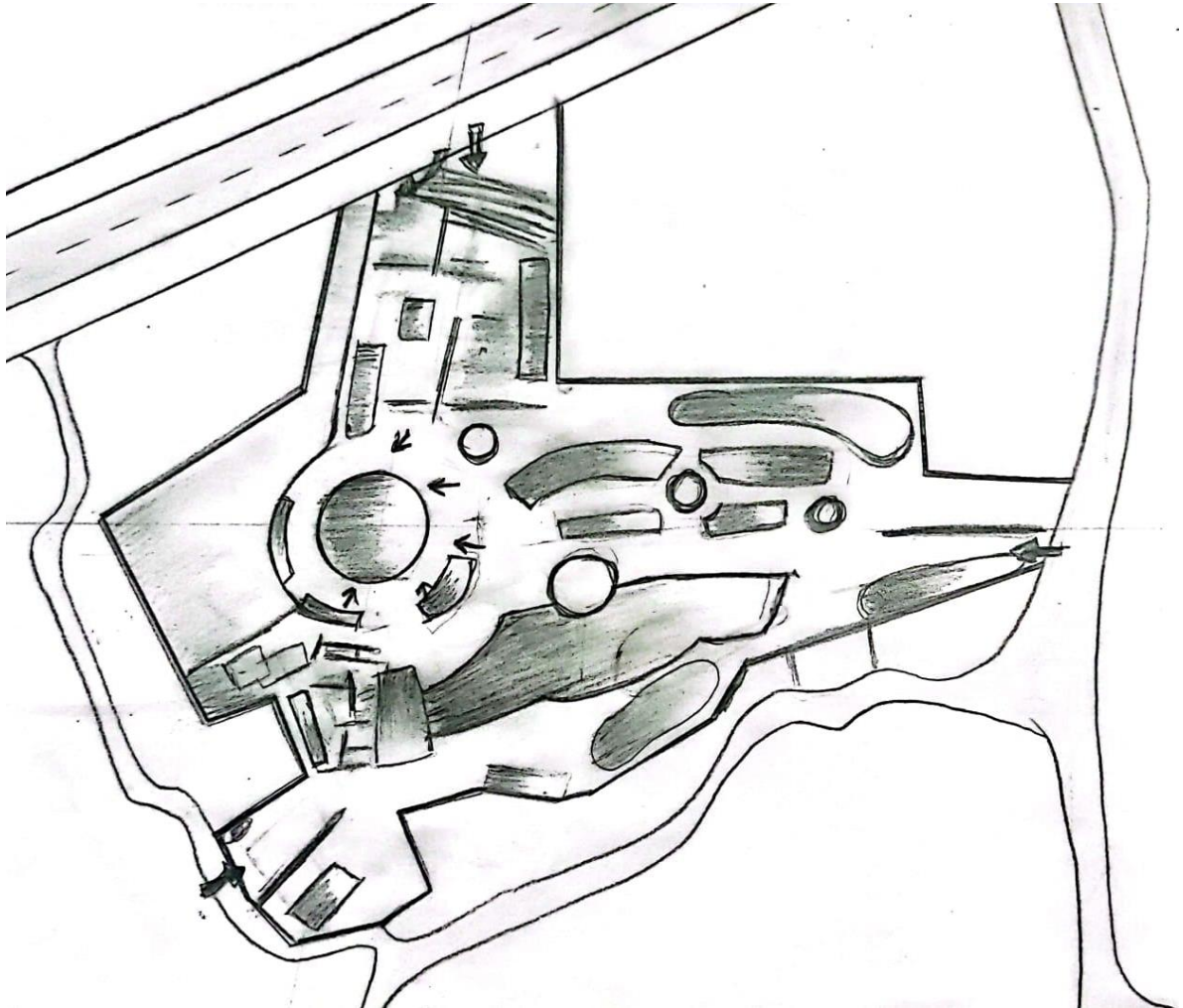
After the placement of the central flexible space, the site was divided into various zone as per the site characteristics. The site directly connected with the Araniko highway was completely dedicated for the entry plaza so that it would attract more people towards the site.

The 8m road was used for the service entry and loading unloading was allocated at the other end of the site so that it would not affect the market circulation. Major markets are positioned with regard for secondary road access so that locals can access them more easily.



Respecting the access of secondary road to the central flexible space the market was divided into two parts where one part was dedicated for retail purpose and one for wholesale. Considering the existing scenario of the market the major selling products were grains, fruits and vegetables which were incorporated in the design.

So as to breakdown the long monotonous stretch of the market nodes were created with reference to the central flexible space providing visual connection with one another that would create pocket of green space in between the market. By creating these nodes, the hope is to create a more visually interesting and dynamic environment that encourages people to explore and spend time in the market.



The concept inspired from the Bhaktapur city itself i.e., alley to an open space was used in the planning and circulation management of the market. In traditional Bhaktapur settlements, alleys or gullies often lead to larger, open spaces that serve as communal gathering places for the surrounding community. By using this same pattern in the planning of the market, the hope is to create a similar sense of community and social engagement within the commercial area.



Figure 129: Roof Plan

6.4. Segregation of Vehicular and pedestrian

Segregation of the vehicular activity from the pedestrian activities to makes the market more walkable, convenient, accessible and people friendly. It also provides ideal solution to the problems of traffic congestion and also ensures the efficient functioning of the market activities and the circulation.

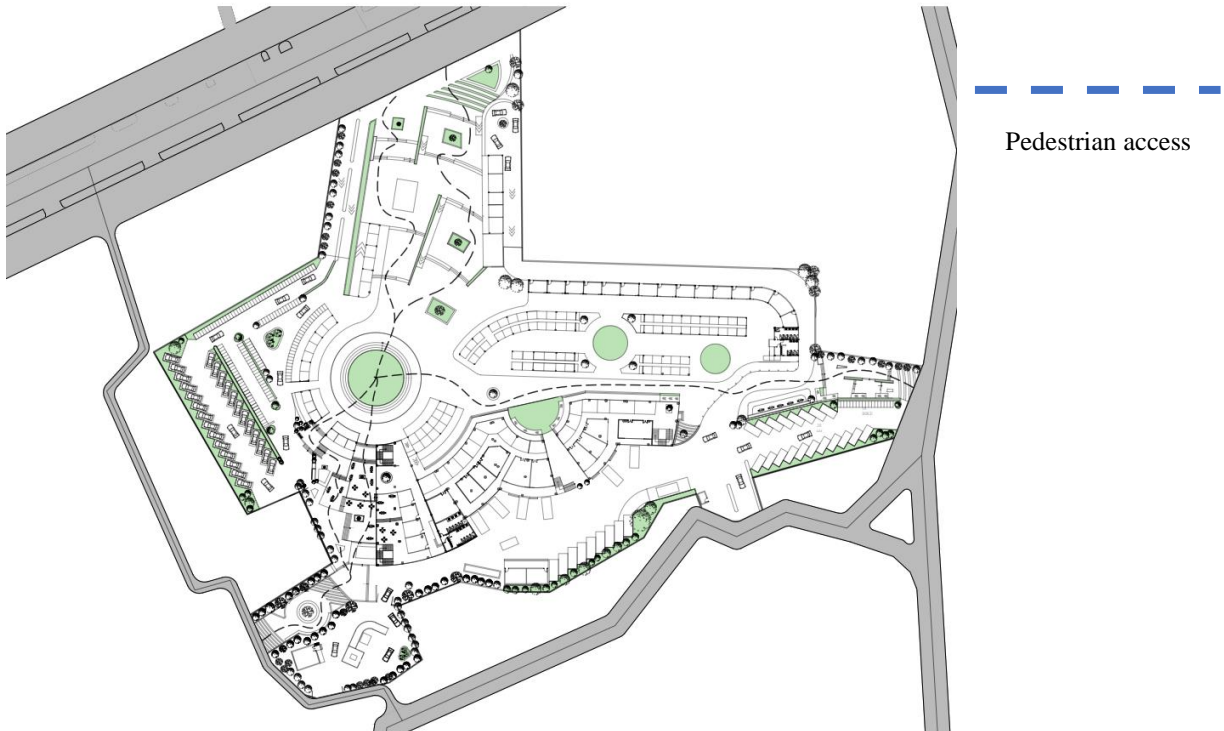


Figure 130: Pedestrian access

The site can be accessed through different entry points which all lead to the central open space through the plazas. This makes pedestrian circulation more interesting and engaging with the provision of spaces for social interaction like dabali, kiosk, semi-open dining, seating spaces.

Separate public and service vehicular entry has been provided for easy circulation and is placed such that they don't interfere with each other's flow.

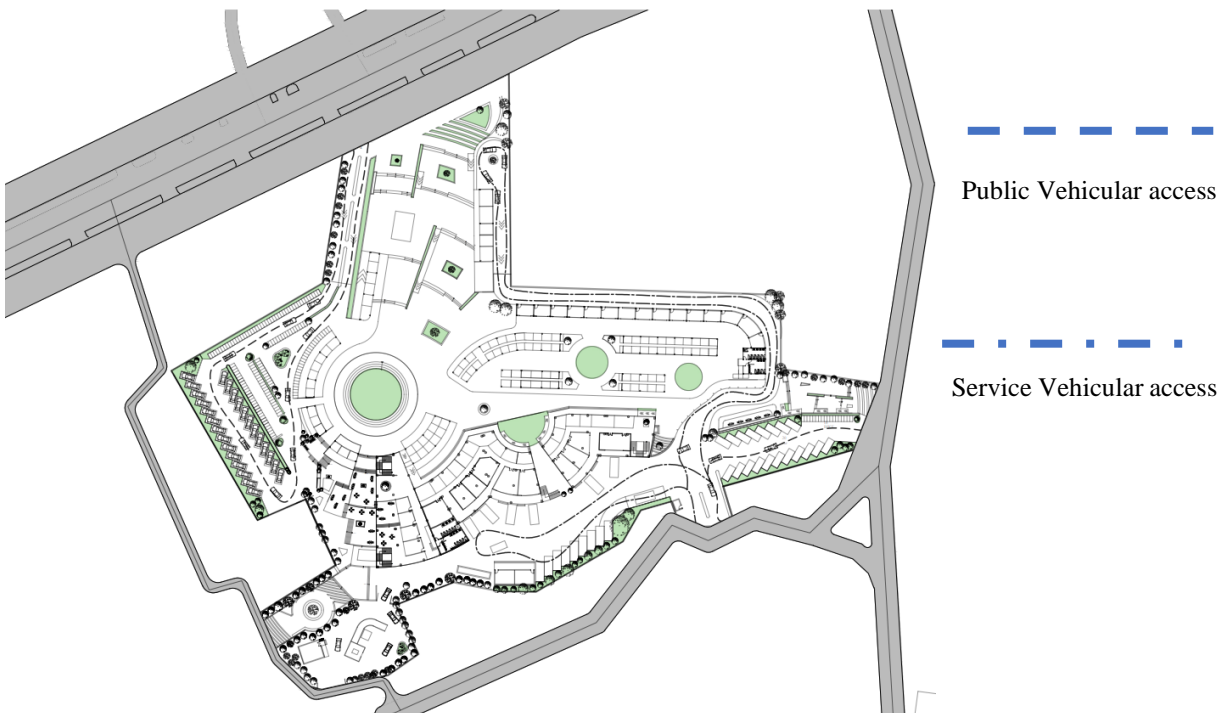


Figure 131: Vehicular access

6.5. Design Visualization



Figure 132: Entry Plaza

Understanding the necessity for visual connection from the main highway, the site connected to the road is designed as a plaza, with the majority of the space allocated to public engagement. The plaza was designed to follow the natural contours of the site, gradually increasing in height as it approaches the central flexible space. It serves as a buffer zone between the outside environment and the market space. Plaza serves as an appealing and inviting location that improves the appearance of the building and gives visitors a sense of arrival. The plaza offers more open and free space, as well as a kiosk selling traditional Bhaktapur specialties.



Figure 133: Secondary Plaza

The site connected with the secondary road has also been provided with secondary entry plaza where following the access one can reach to the central flexible spaces passing by the market.

A road connects the site to the community on the site's southern side. Taking advantage of it, this side of the site has been developed as a community space, with space for social interaction, a children's play area, and a semi-open kiosk space, so that the community can benefit and use the space for interactions, which is also a major goal of the project. This area is also directly linked to the center flexible space.



Figure 134: Community Entrance

The central flexible space is the project's main connecting element. This area connects all of the entrances. The benefit of creating center flexible space is that the space may be used and modified as needed. The area could be utilized for a community gathering, a children's play area, a vendor booth, or a food court. A central flexible space in a farmer's market is intended to offer an adaptable area that may be used to improve the overall market experience for vendors, customers, and the community.



Figure 135: View from central space

Loading/ Unloading is placed at the back of the entrance so that it doesn't come in direct view of the public and also doesn't interrupt the flow of the market. Storage has been directly connected with the loading and unloading for easy access.



Figure 136: Loading /Unloading

A bridge is provided that acts as a connecting path between the two blocks and also separates the public and service area.



Figure 137: Connecting Bridge

As the concept is to reflect the traditional Bhaktapur market pattern. Similar space is created through retail market where galli (alley) through markets stalls leads to an open space.





Figure 138: Alley to an Open space



Figure 139: Connection Between the Nodes

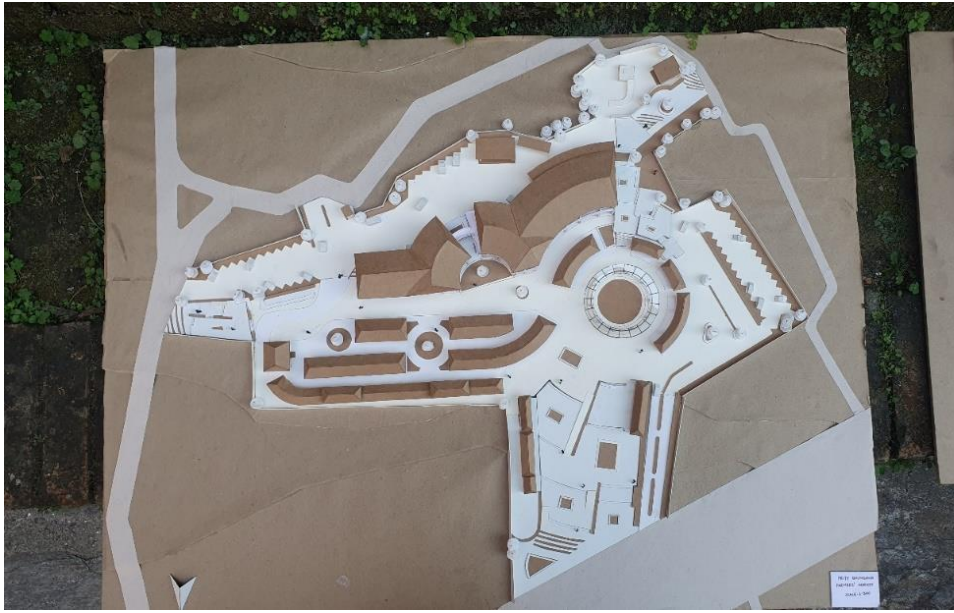
The main idea of the market is to reflect the surrounding Bhaktapur city which has been achieved through the use of similar material and color palette. The use of elements like struts, Jhingati Tiles, brick pavements, Pati, and full brick façade creates a walking experience similar to that of traditional Bhaktapur settlement. The use of curves on the building and stalls creates the sense of more interesting circulation throughout the market and compliments the central flexible space. However, incorporating the traditional elements and proportions in a modern building form is the major intervention for the building design which allowed modern buildings to blend in with their surroundings while still maintaining a distinct and contemporary character.

The idea is to create of buildings that are functional, aesthetically pleasing, and culturally relevant.



Figure 140: Aerial View

6.6. Physical Model



Top View



Entry Plaza



Secondary Entry



Service Entry



Community Entrance



Central Flexible Space

Figure 141: Physical Model

7. SERVICES AND UTILITIES

7.1. Water Services

The sources of water for site are municipal water line and boring. Total volume of water required is stored from source in raw water tank. Water obtained through boring is aerate before sending to the raw water tank. The water to be used in the building is then pumped to treatment plant and then into the treated water tank. Water from treated water tank is pumped to an overhead water tank.

The water required for firefighting is pumped directly into firefighting water store tank from raw water tank. The quantity of the water tank capacity is done based on water requirement as guided by NBC- 208

Based on Nepal water sewerage board standards (Drinking water installation and drainage requirements in buildings in Nepal, page 88):

Calculation of quantity of water for market

Basic requirement (assuming a medium demand of 4 liters per sq m of effective floor area for covered markets = floor area of 2520 sq m x 4 liters /m ²)	= 10,080 liters
50% contingency	= 5040 liters
Estimated Total Water Demand	= 15120 liters

Total Demand Calculation

Table 21: Calculation of Water Demand

S.N.	Description	No. of People	Over head	Total
1	Administration	35	45	1575
2	Kiosk	40	50	2000
3	Restaurant	125	50	6250
4	Bank	15	45	675
5	Market Demand			15120
	Total			25620

Calculation of Water Tank

Total Water Consumption per day: 25620 L = 25.62 cu. m. approx...

Size water tank= 25.62 * 3 (Safety factor) = 76.86 cu. m =80 approx.

Size of underground water tank = 5 x 5.5 x 3 cu. m (L x B x H)

Firefighting requirement (NBC) = 50 cu. m.

Size of underground water tank = 4 x 5 x2.5 cu. m.

7.2. Sewerage Management

Sewerage treatment plant is proposed for environment friendly management of sewerage as the waste water that leaves the treatment plant are lot cleaner than the septic tank and can be directly discharged into the local water course (instead of soak pit or drainage fields). The waste water also further treated for potable water.

Table 22: Sewerage Calculation

S.N.	Description	No. of People	Remarks
1	Administration	35	
2	Kiosk	12	30% of 40
3	Restaurant	38	30% of 125
4	Bank	15	
5	Vendors	136	
6	Visitors	100	20% of 500
	Total	336	

Calculation for sewage Treatment

Total number of users = 336

Volume of Septic tank required = No. of users x 3 cu. ft.

$$= 336 \times 3 \text{ cu. ft.}$$

$$= 1008 \text{ cu. ft.}$$

$$= 28.54 \text{ cu. m.}$$

Hence,

No. of Septic tank = 1

Volume of septic tank = 28.54 cu. m.

Assuming the height of septic tank = 3m

$$L \times B \times H = 28.54$$

$$3B \times B \times 3 = 28.54$$

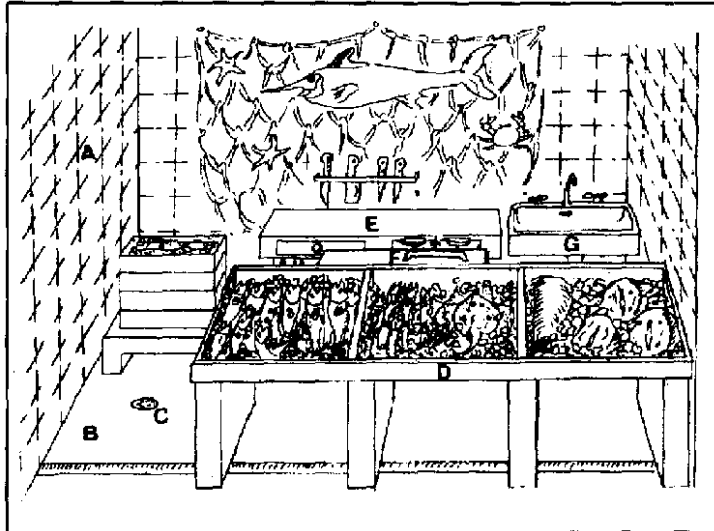
$$B = 1.8 \text{ m}, L = 3 \times 1.8 = 5.4 \text{ m}$$

Septic tank size = 5.4m x 1.8m x 3m

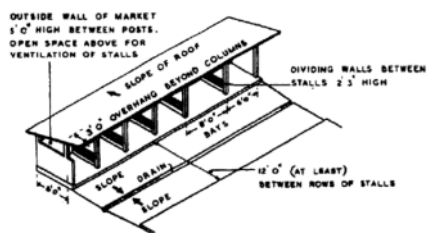
Size of soak pit = 6 x sp.6 (sp.6 = Dia. 5m and depth 2.75) from standard

8. ANTHROPOMETRIC DATA

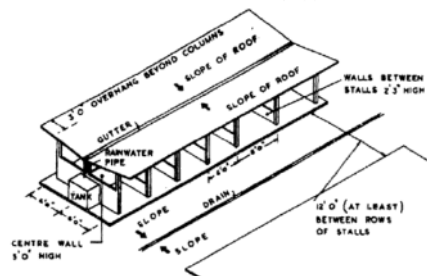
8.1. Furniture details and Market Stall Layout



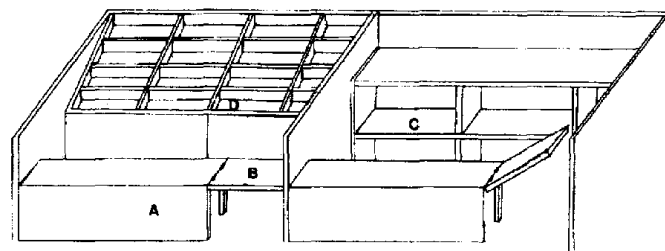
- A. stall constructed in block or brickwork, finished in light-coloured ceramic tiles
- B. ceramic or cement-screed non-skid flooring
- C. drainage outlet in floor
- D. stainless steel, terrazzo or marble inclined display area for meat or fish
- E. cutting board for gutting fish or cutting boneless meat
- F. weighing scales
- G. sink and water supply

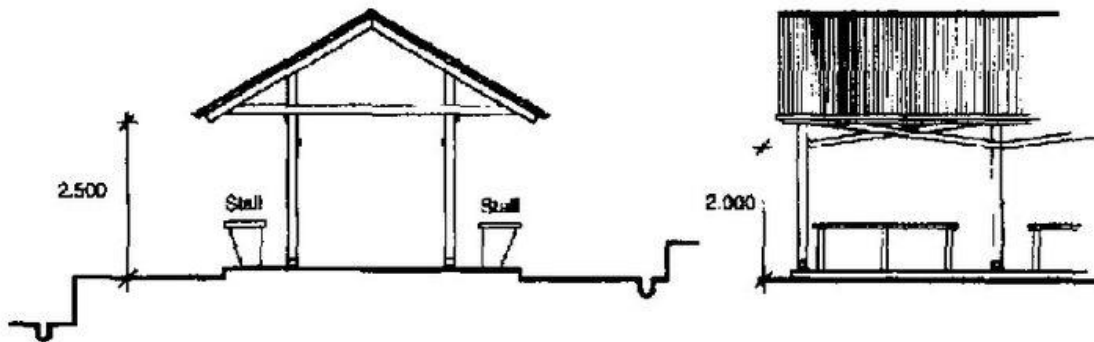
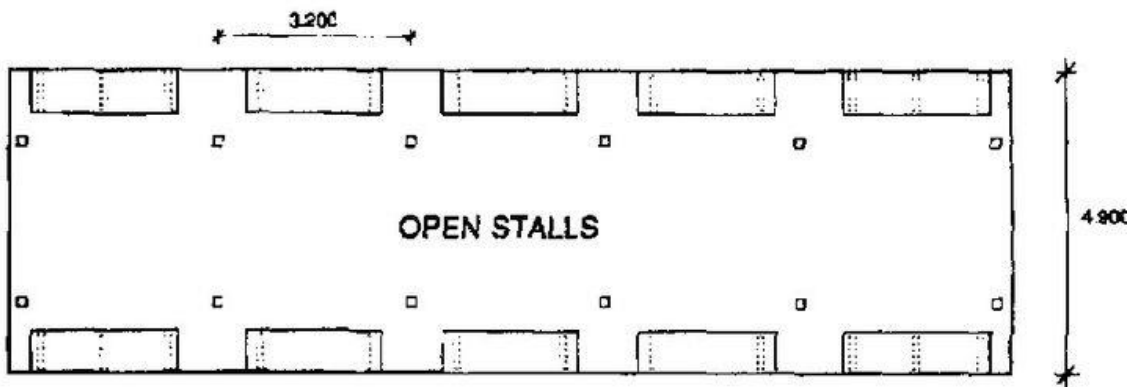
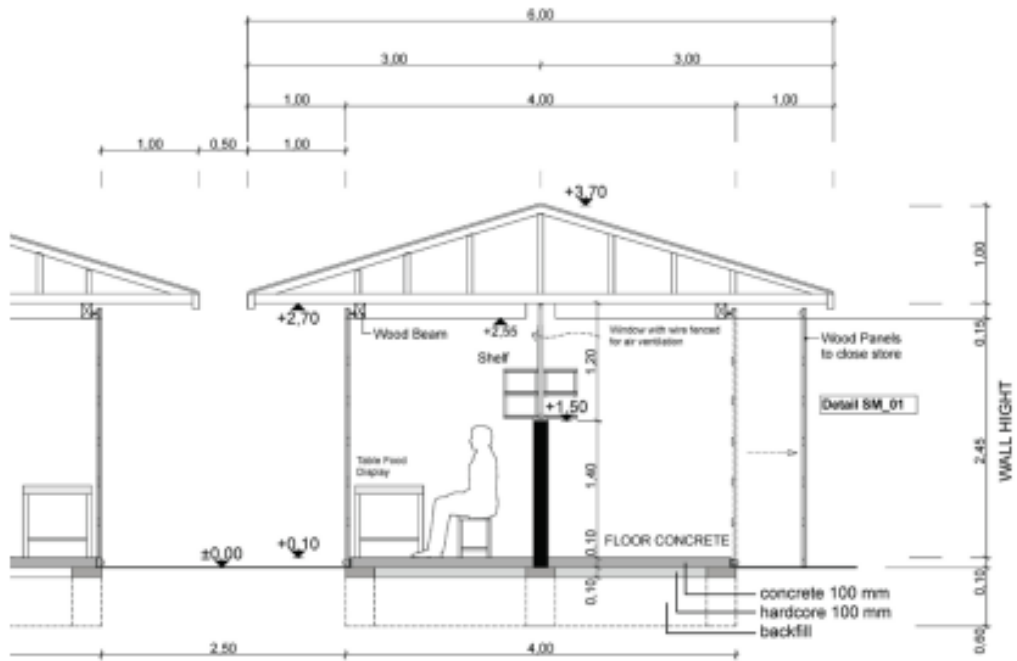


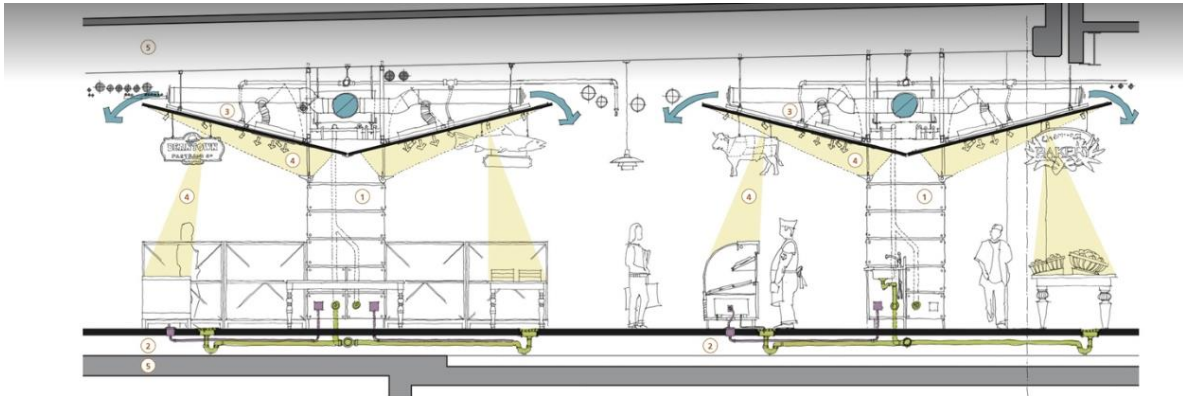
PLAN FOR COVERED STALLS ALONG OUTSIDE WALL OF MARKET: SAME PLAN CAN BE USED FOR GROUP OF SMALL WORKSHOPS.



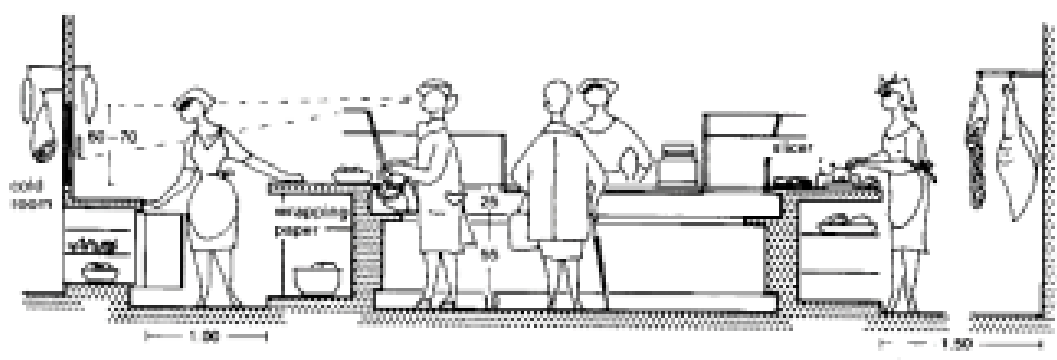
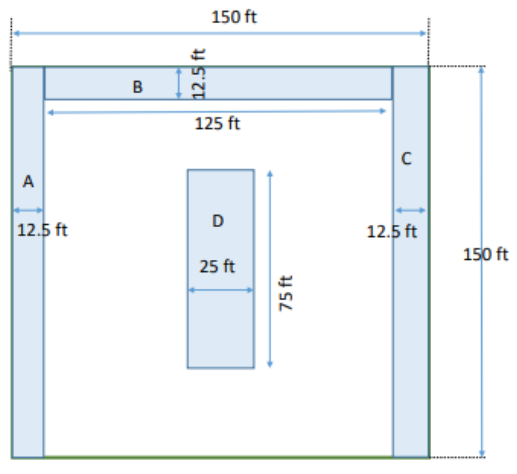
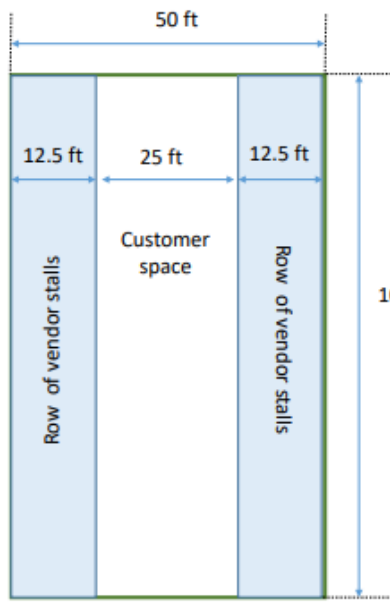
PLAN FOR CENTRE BLOCKS OF MARKET STALLS
NOTE: STALLS WILL BE BUILT IN BLOCKS OF NOT MORE THAN TWENTY STALLS.
SLOPE OF ROOF AND THICKNESS OF WALLS WILL DEPEND ON MATERIALS



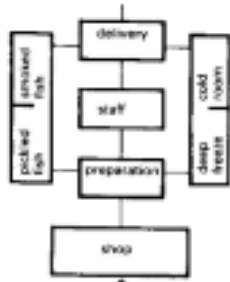




- 1 Flexible Utility Pylons**
Clad in demountable panels, the regularly-spaced pylons define the rented module and aggregate vertical plumbing and electrical runs to service a myriad of possible vendor configurations, allowing for ease of change over time.
- 2 Raised Concrete Slab**
Unifying the market in two accessible levels, the 3" concrete raised slab supported on rigid insulation also enables floor drains piping and electrical floor box conduit to flexibly serve the vendors in this basement-less space.
- 3 Utility Carrier Canopy**
Corrugated aluminum canopies sheath a slotted-steel frame, organizing HVAC infrastructure, sprinkler system, and plumbing and electrical main branches. Integral corrugated aluminum access panels are provided at each stall.
- 4 Up-lighting & Display Lighting**
Linear pendant up-lights wash the white aluminum canopies, creating a luminous plane, while LED track lights spotlight the bountiful merchandise.
- 5 Existing Structure**
Above the market, pre-cast concrete double-T's structure the parking garage, and below the market, a complex network of two-way concrete slabs and grade beams, challenge the market to have self-contained infrastructure without access through an adjacent plenum or cavity.



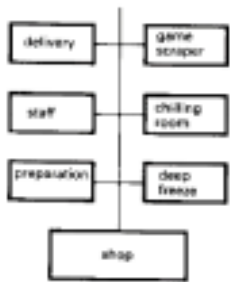
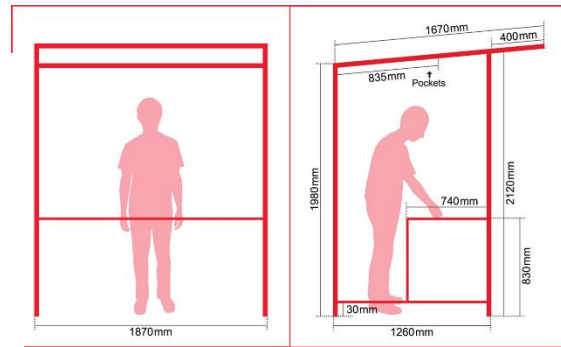
11 Normal Butcher's counter (also for fishmonger's) = 12



1 Functional diagram for fishmonger's



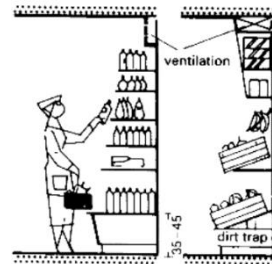
2 Fish counter with cooling compartment and drain



3 Functional diagram for poultry and game shop



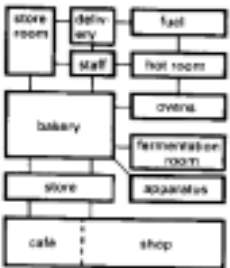
4 Solid counter with marble or tile facing



1 Shelves for bottles Shelves for fruit, vegetables and loose goods



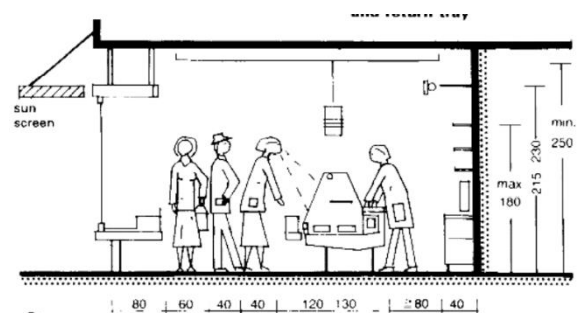
2 Partition allowing replacement of containers from refilling aisle



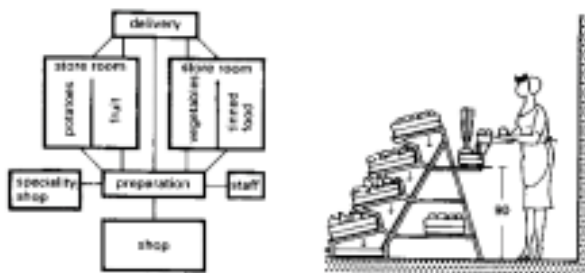
5 Functional diagram for a bakery: good ventilation needed, possibly dehumidify



6 Sales counter with screen



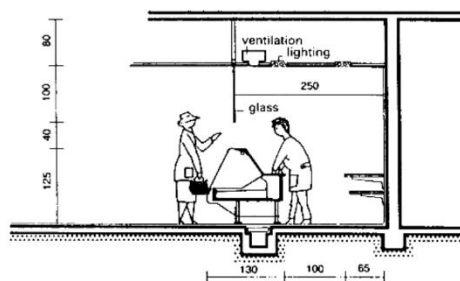
7 Minimum width of a shop ≥ 4.0m, preferably 5.0m



7 Functional diagram for fruit and vegetable shop: little storage provision as most

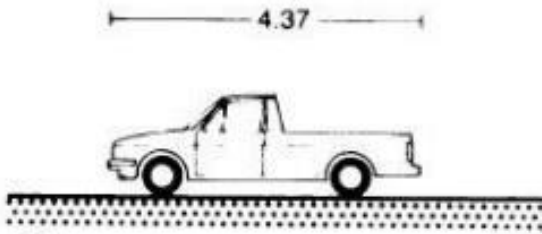


11 Counter with stands for boxes and baskets, drip pan and dirt trap

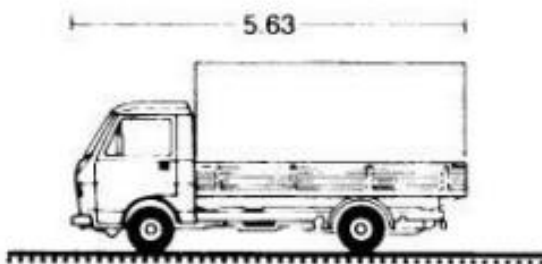
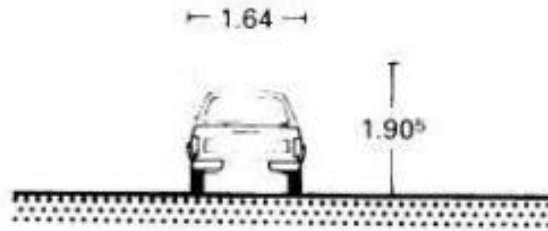


14 Section through counter in a self-service shop

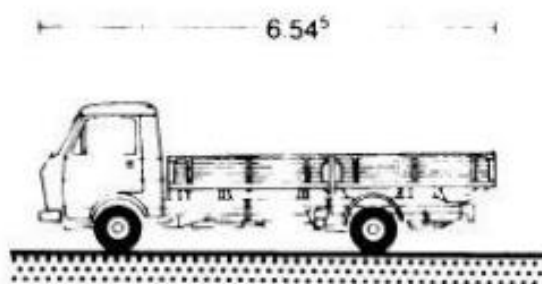
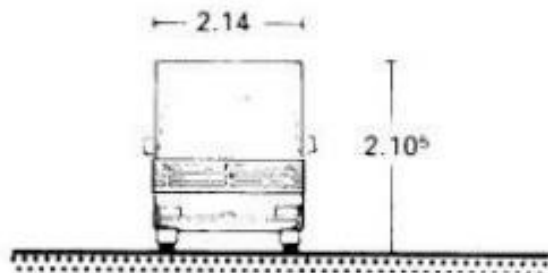
8.2. Vehicle Farm Standard



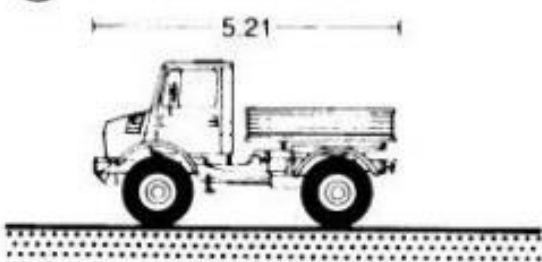
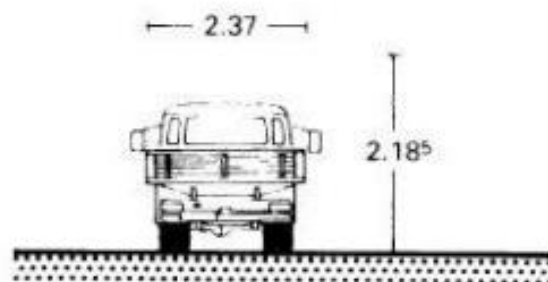
① Pick-up van



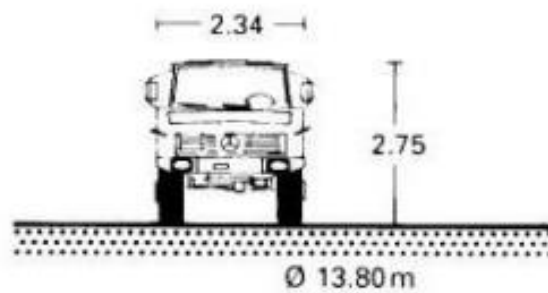
② Fixed-bed truck

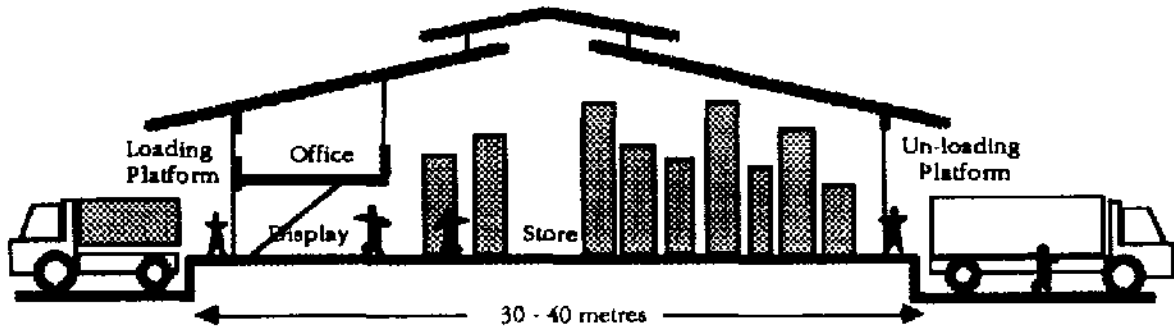


③ Fixed-bed truck

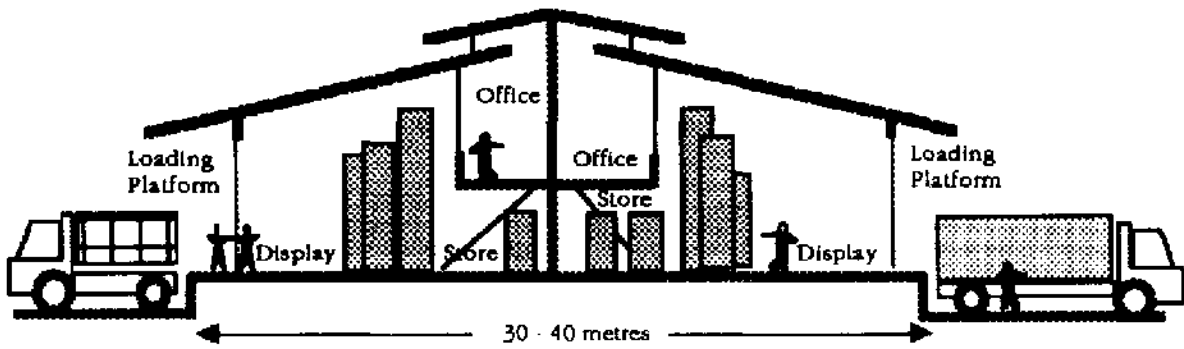


④ Off-road truck

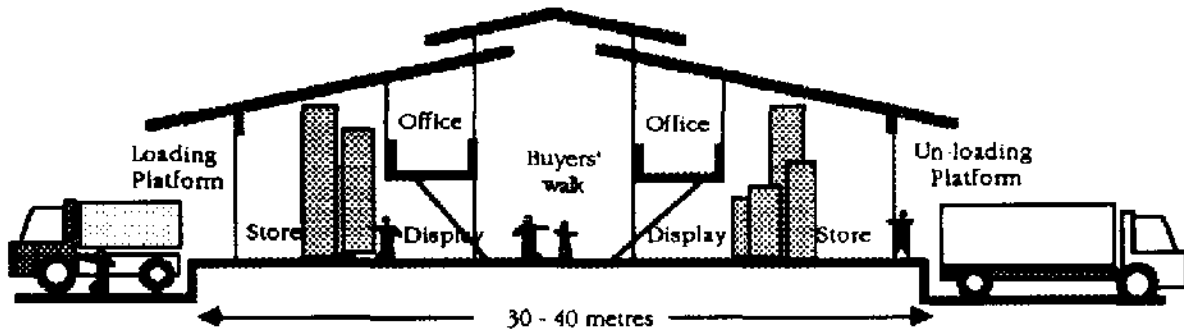




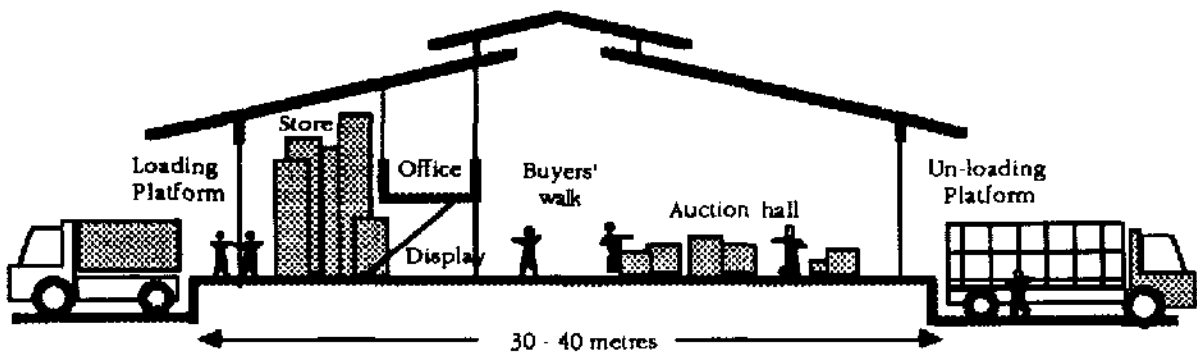
1. Garage type wholesalers' stalls



2. Back-to-back wholesalers' stalls

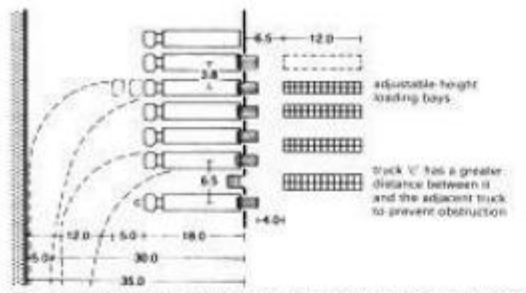


3. Central spine with buyers' walk

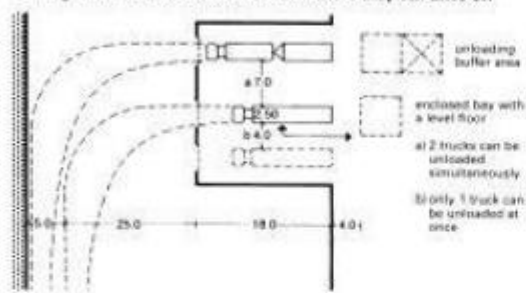


4. Central spine with buyers' walk and auction hall

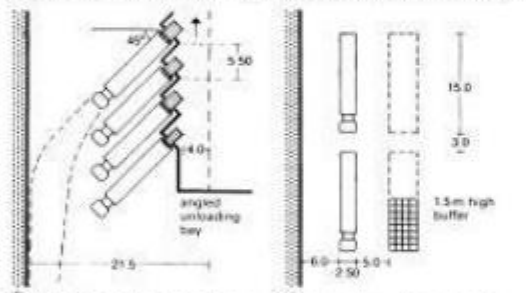
8.3. Loading Bay standard



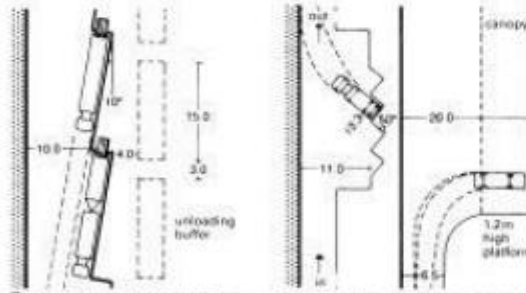
1 Close-packed loading and unloading bays; vehicles parked close together must ease forward a little before they can drive off



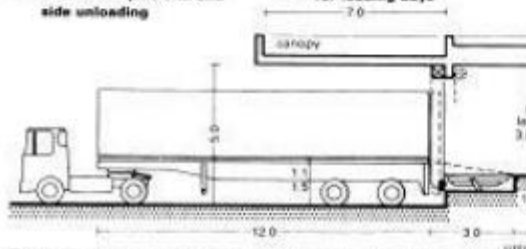
2 Loading and unloading bays take up the most space in the yard



3 Loading and unloading bays



4 Loading and unloading bay with raised platform and side unloading

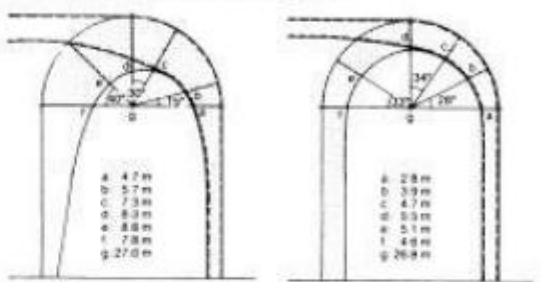


5 Section through a loading bay with an adjustable loading platform

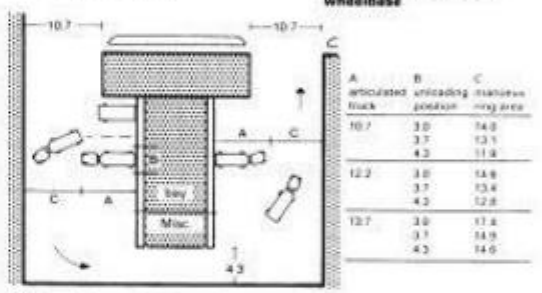
An example of the ideal depth of yard for articulated trucks with overall lengths of 18m is shown in 1. Calculations based on experience show that under these conditions a length of 35m is required for access. Even the longest articulated truck can then be driven swiftly in and out. This is an important factor in controlling the turn-round of the vehicles on scheduled runs. If the above-mentioned conditions cannot be met, the saw-toothed bay layout, with an angle of 10°-15° offers a practical solution.

The largest turning radius for an articulated truck is about 12.00m. The safe distance to be allowed between two adjacent trucks is a minimum of:

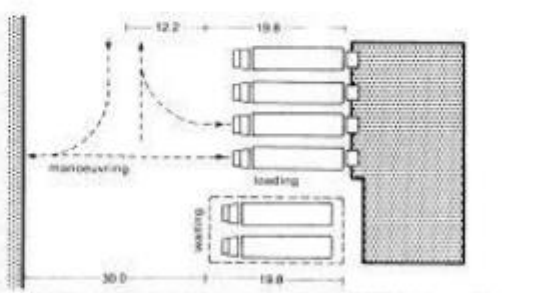
- 1.50m with the use of a loading dock;
- 3.00m with the use of loading doors.



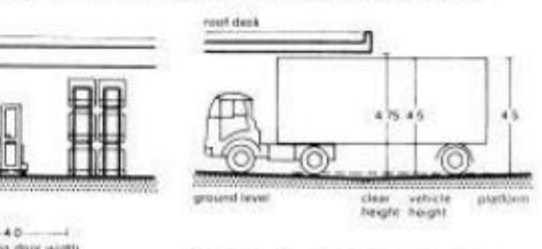
6 Normal turning circle dimensions for a 15m long articulated truck



10 Loading and unloading in a courtyard



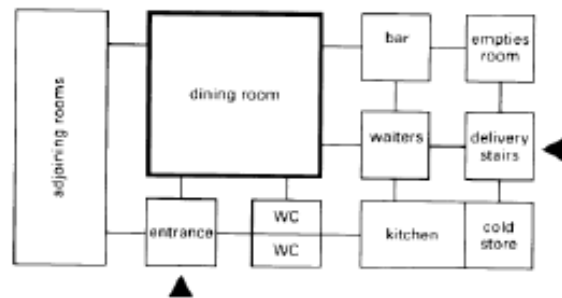
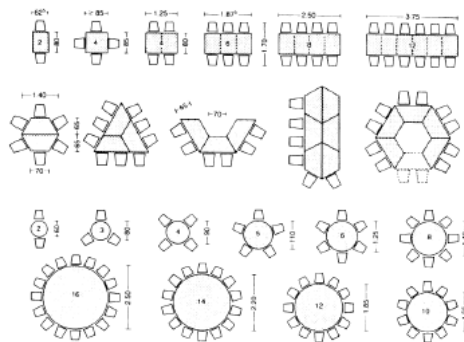
11 Traffic driving clockwise on the right-hand side of the road



12 Dimensions for sheltered loading bays

8.4. Restaurant Standard

- Entry
- Dining Space - It is the main room of a restaurant and facilities should correspond with the type of operation. A number of additional tables and chairs should be available for flexible table groupings.
- Waiters' station - It is the space from where waiters perform their duties, from where they are distributed, they look after customers and from where they provide service to customers.
- Counter
- Bar
- Kitchen
- Store - cold store/dry store
- Administration (manager's office, meeting room, staff's room, changing room etc.)
- Service entry
- Other spaces (meeting hall, conference room, children's play area etc.)



Functional layout for a small restaurant

dining floor area	walkway width
up to 100m ²	≥ 1.10m
up to 250m ²	≥ 1.30m
up to 500m ²	≥ 1.65m
up to 1000m ²	≥ 1.80m
over 1000m ²	≥ 2.10m

customer places	toilets		unisex toilet	animals (IT)
	men	women		
50	1	1	2	2
50-200	2	2	3	3
200-400	3	4	4	4
400	- determine in individual case -			

8 Walkway widths

The minimum width of escape routes is 1.0m per 150 people. General walkways should be at least 1.10m → 8, with clearance heights ≥ 2.10m. The window area should be ≥ 1/10 of the room area of the restaurant.

9 Toilet facilities

type	chair occupancy per meal	kitchen area required (m ² /cover)	dining area required (m ² /seat)
exclusive restaurant	1	0.7	1.8-2.0
restaurant with high seat turnover	2-3	0.5-0.6	1.4-1.6
normal restaurant	1.5	0.4-0.5	1.6-1.8
int./questhouse	1	0.3-0.4	1.6-1.8

tables	seats	water service (m ² /seat)	self service (m ² /seat)
square	4	1.25	1.25
rectangular	4	1.10	1.20
rectangular	6	1.05	1.10
rectangular	8	1.05	1.05

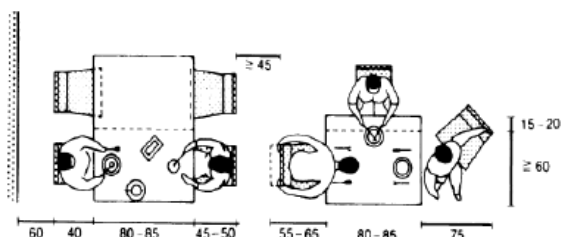
10 Floor area requirements

approx. 80% supplement is added for storage rooms, personnel rooms etc.
Cover = seat × no. of seat changeovers

11 Total space requirements for dining rooms: 1.4-1.6 m²/place

main aisles	min. 2.00m wide
intermediate aisles	min. 0.90m wide
side aisles	min. 1.20m wide

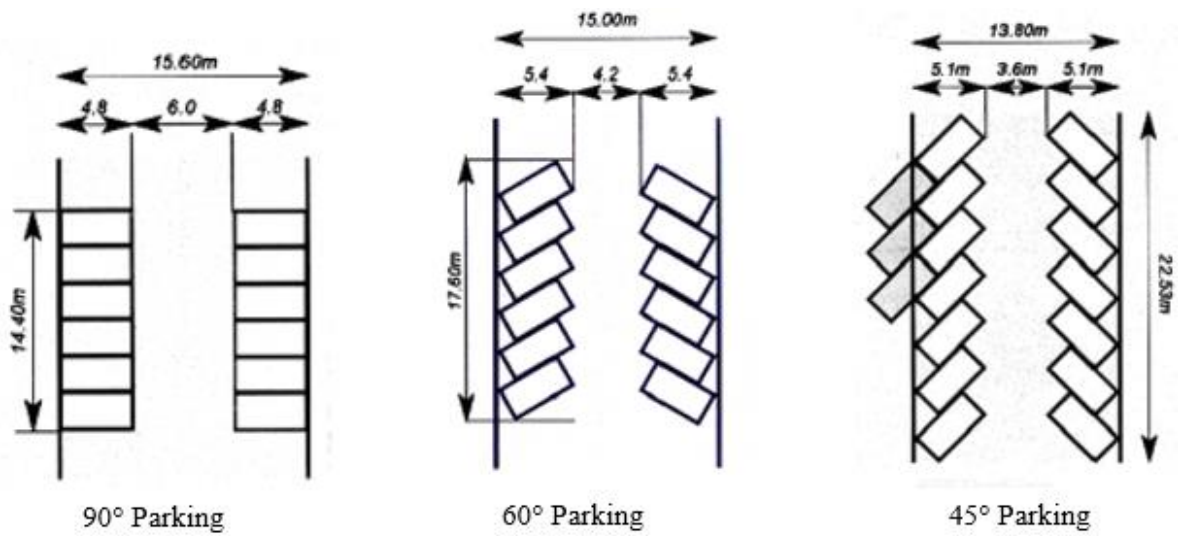
12 Aisle widths



8.5. Parking

Turning Radius

Types of Vehicles	Length(m)	Width(m)	Height(m)	Turning circle radius(m)
Motor Cycle	2.20	0.70	1.00	1.00
Car	4.70	1.75	1.50	5.00
Bus	11.40	2.50	3.30	6.50



9. CONCLUSION

People are now so preoccupied with their everyday activities that they have lost sight of the importance of marketplaces, which act as a place for both social interaction and the buying and selling of goods and services. People involved in the recent urban renewal have forgotten what it means to live in a city, failed to adapt to daily life, and altered the way markets are constructed. Convenience stores are where busy people who value convenience over health purchase their groceries. As a result, both the market's size and the infrastructure that supports it drastically decreased. However, in recent days, the popularity of farmers' markets is growing as consumers place a greater emphasis on their health than on convenience.

Public infrastructure, like markets, has an effect that extends beyond the site border and affects the entire urban community. One outcome is the potential for mixed-use developments along the highways that encircle the markets. The vibrancy of any public area is a sign of success. A great public space offers a variety of uses and attractions to entice visitors. When public open space is triangulated with public infrastructure like a market, a lively public precinct reminiscent of our historic public places is produced.

Hence the purpose of this study is to understand how a marketplace can incorporate vibrant public spaces to foster activities, social interactions, and dynamic connections among the varied resident populations.

10. REFERENCES

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ANNEX

(DESIGN AND DRAWINGS)