

Urban Agriculture: A Tool for Harmonious City

A Case of Kathmandu Valley, Nepal



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1 Urban Sector Review

"My heart is deep in the country. But I live for the City."

1.1 Basic General Data

Geography/Location/Administration

Nepal is a small South-Asian land locked country between big countries like China and India. Nepal with its rich biological diversity and ecological zones ranging from 200-8000m horizontally divided into three regions, High Mountains, Hills and Terai. The country has an area of 147,181 square meters and divided into 5 development regions, 75 districts and 14 zones. The Kathmandu Valley consists of three districts, Kathmandu, Lalitpur and Bhaktapur with an area of about 580 sq km according to the study of Kathmandu Valley GIS Database by UNEP/ICIMOD. Though the country is heading to Federal structure still central and local government is ruling in different level of administration.

Economy (Refer Table, A2-Anex I)

Agriculture still is a dominant economic activity (47%) and other informal urban activities, services and remittance.

Population, Demography and Health

Total pop- 26.97 million out of which 49.88(Female) and 50.12(male)

Kathmandu alone holds a population density of 13,586.37 persons per km². 2001, SYB, 2007. Life expectancy at birth is 60.01 year for male and 59.5 years for women giving an average of 59.8 years. Also refer tables - 1 and 2 from annex-1

1.2 Urban Situation Analysis

Kathmandu Valley having its rich medieval past is undergoing rapid transformation due to increasing urbanization (7% per annum) and growing demand for shelter. The growth in housing activity has been reducing the precious agricultural land around the valley making valleys ecology vulnerable. The concept of urban agriculture as practiced in many countries today can be a sustainable solution to retain the valley's fragile ecology which was well mentioned in the traditional urban planning practice. Urban agriculture as a means to livelihood to urban poor and a contributor to city's environment has become an essential component of contemporary urban planning endeavour in Kathmandu Valley. This could well be the answer to the valley's quest for harmonious living with nature.

The study context

Housing is a growing problem for urban poor and the migrants. Over ten years, the city has experienced remarkable growth in its informal settlements. The migration rate from rural to urban is high. Census 2001 reveals that out of a total of 2, 929,062 migrants 25% migrated from rural to urban, only 4% from Urban to rural. In the case of Nepal, migration has been considered as the main contribution to this rapid growth; urban-bound migration accounted for 28 percent of all migration (CBS 2003).

The growing population demand additional housing so increase in haphazard built-up area which is affecting on land encroachment and losing agricultural land so is the result on threats of Livelihood sustainability of urban farmers and urban poor. Housing or access to land is one of basic needs. By law anybody interested to purchase a land can do so. However poor families are not in a position to benefit this legal and democratic provision. The UA is not only predominant factor of Livelihood but also related in socio-cultural matters like most of the festival are related with farming. So the loss of UL is not only threat on livelihood

but also in total traditionally harmonious society and urban communities. So this forms a logical ground for the need of study on the following aspects:

- SL for Urban and Migrants
- Poverty Reduction
- Arable Land conservation
- New Urbanism" and Urban Greening Concept for harmonious urban development.

McLaughlin defines New Urbanism as *“The goal of ‘New Urbanism’ is to reverse the trend of ‘urban sprawl’ by learning from traditional urban development patterns and thereby preserving open spaces for natural habitats, active recreation, and productive agriculture”* (McLaughlin, 1997). While urban greening is often understood as the re-establishment of trees in cities e.g. to reduce heat island effects and to improve the urban microclimate, but it is more related to productive greening i.e. sustainable greening that needs to incorporate urban agriculture.

Urbanization Trend and Agricultural Land in Kathmandu Valley

The population growth rate of Kathmandu, Lalitpur, and Bhaktapur municipalities is much higher than the national average growth - 2.08 percent between 1981 - 1991 censuses, which is being clearly marked by migration to Kathmandu Valley from other districts of Nepal. The urban growth rate of Kathmandu Valley (6%) highest of all other urban centers indicates the rapid urbanization of the valley” (Uprety 2000).

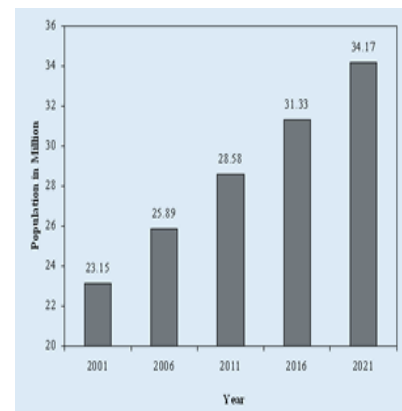


Table: 3 Urbanization Trend and Projection of Urban Population of Kathmandu Valley

Year	Total Population of the Valley	Urban Population of Kathmandu Valley			
		Kathmandu	Lalitpur	Bhaktapur	Total
1981 (CY)	740,619	259,185	79,875	74,548	413,608
1991 (CY)	1,078,909	452,597	115,865	93,375	661,837
2001 (P)	1,571,683	767,567	163,923	114,695	
2011 (P)	2,020,404	1,057,582	229,852	155,328	
2021 (P)	2,597,238	1,439,328	319,655	209,921	
2031 (P)	3,338,760	1,937,756	440,882	283,062	

Source: Development Plan 2020 of the Kathmandu Valley CY =Census Year, P= Projected

“In Kathmandu and Lalitpur, the share of agricultural land in 1981 was 40% and 52% as compare to the 66% and 71% respectively (PADCO 1986). This rapid conversion of land from agricultural use to urban use fuelled by growing urbanization has led to the increase in public and residential built up areas. Recent urban land study shows that the expansion of built area of Kathmandu-Lalitpur between 1971 and 1981 was much grater than during the twenty-year period between 1951 and 1971. The residential areas increased by 134% in Kathmandu and 94% in Lalitpur respectively between 1971 and 1981(PADCO 1986). Chhetri in "Urban Land Policy Issues in Kathmandu Valley" (1986) also notes that in 1954, the built up areas of Kathmandu- Lalitpur covered 1076 ha as compare to almost double built up areas in 1981 covering an area of 3291 ha. The massive increase in residential land use was observed during this period covering an additional area of 1075 ha” (Uprety 2000). The agricultural land of the valley has been decreasing at the rate of 1.41%per year, (Raut 2006), due to rapid urbanization.

Table 4 Land use in greater Kathmandu (ha.)

S.N.	Land use	1971	1981	1991
1.	Agricultural land	4271	2731	1734
2.	Urban land	1497	3170	4355
3.	Open space	255	245	143
4.	River	241	241	241
Total		6264	6387	6473

Source: *Regulating growth: Kathmandu valley, 1995*

PADCO (1986) estimates that 56% and almost all of Kathmandu valley's class I land and would be urbanised by the year 2001 and 2010 respectively. At this rate no agricultural land will exist in the valley in the year 2020 when almost 60% of the entire valley will have been urbanised. Also refer (Annex II- the Role of valley in agriculture).

City Planning and Urban Agriculture: facts and figures

History

Historically speaking the people of Nepal have depended more on agriculture and livestock products for their livelihood, so is the case of urban communities of Kathmandu valley. Kathmandu valley well known for its fertile soil and community wastes used to feed Urban Farmers is open to us. The fertile land of Nepal Valley was ruled by the Gopals and Ahiras in the second half of the second millennium BC. They were the shepherds of Aryan stock who had migrated to this region from the west and south with their livestock in the beginning of the Neolithic period around the middle of the third millennium BC. Two groups of Mongoloids, called Magars and Gurungs, also entered Nepal from the north with their flocks of goat and sheep and occupied the high mountainous region of the country (Pandey, 1989, pp. 51-55, CF Prasain, 2006).

The medieval period in Nepal under the Malla dynasty (13th – 18th centuries), the population of Kathmandu has been dominated by the farming community, as the agriculture was the main economic base of the city dwellers. It can be observed that the setting of the historical towns of Kathmandu valley was always on less irrigated higher lands, called tar. And the perimeter goods actually are located such as to keep the irrigable agricultural outside the settlement limits.

People's household level livelihood in Nepal depended mostly on livestock and agriculture.

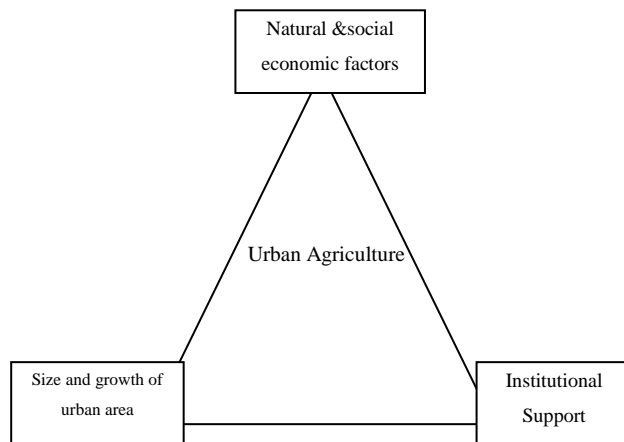


Figure 1

Major elements of UA in the context of Nepal are **Urban Size and features, natural and socioeconomic factors, and institutional support** is explained in the figure-1

Source: Public Policy and LD Opportunities and constraints

50% of the world's population lives in cities. 800 million people are involved in urban agriculture worldwide and contribute to feeding urban residents. Low-income urban dwellers spend between 40% and 60% of their income on food each year. By 2015 about 26 cities in the world are expected to have a population of 10 million or more. To feed a city of this size- at least 6000 tones of food must be imported each day.

In Valley context, from the statics it is revealed that 28.2% of the economically active population and 40% economically active female in urban area are still engaged in agriculture sector. Unemployment rate is in decreasing trend at national level, while it has been increased from 8.2% in 1995/96 to 13.2% in 2003/04 in the case of urban areas. (CBS 2006). The agricultural land of the valley has been decreasing at the rate of 1.41% per year. Rapid urbanization has raised serious environmental problems and creating the imbalanced urban ecosystem. Many large urban areas are food deficit. On average, food inadequacy is 17% in urban areas compared to 34% in rural areas. In case of Kathmandu valley, its urban population is estimated to require nearly 600,000 metric tons of food grains by 2011 (Pradhan, 2002).

“UA has emerged as an important constituent of UD in recent years in the developing world”. (Baker et al.2000)

Rapid urban growth coupled with an inadequate government response has led to the proliferation of unhealthy, poorly serviced, and infrastructure deficient

hazard-prone areas. It is mostly the urban poor who are forced to settle in these areas.

Importance, Role and significance of UA

The importance of UA is accepted globally. Nepal's history and practices shows the high contribution of UA on urban lives. The major advantage of urban agriculture is that the poor can grow their own food on plots in urban areas, thus increasing their access to much needed food and that they can also sell the little surplus over and above their consumption in the city market. Above all, enhancing the greenery of urban land use by turning idle open areas into plant cover is the main aim of urban agriculture. A common and efficient form of UA is the bio-intensive method. Because UA promotes energy-saving local food production, urban and peri-urban agriculture are generally seen as sustainable practices. (UA-wikipedia-2008). The emerging importance of UA can be discussed in terms of economic, social, cultural, environmental, energy efficiency, quality of food and other benefits. From the Literature review and Internet search UA benefits can be summarized and categorized under sub-headings as:

Physical benefits	Social Benefits	Economical Benefits	Ecological benefits
<i>Utilizes the unused land and unsuitable land for other uses.</i>	<i>Food security within the household, and community social life especially for urban poor.</i>	<i>Employment opportunities for the unskilled migrants</i>	<i>Improve the microclimate and reduces the CO₂ accumulation.</i>
<i>Provide green and aesthetic urban environments</i>	<i>Improves the supply foodstuffs qualitatively and quantitatively in the city at affordable prices</i>	<i>Saves fossil fuel consumption as long distance food travel is reduced.</i>	<i>Helps to decrease air pollution, maintain ground water table and keep bio-diversity.</i>
<i>Increases open spaces and try to maintain balance built up and open space ratio.</i>	<i>Conserves and promotes many festivals and culture and traditions that are closely associated with farming and sell or buy in local shops in the local market.</i>	<i>Direct link of activity with market</i>	<i>Supports for waste management and soil nutrient recycling</i>
<i>Prevent the surface sealing problem and maintain underground natural system</i>	<i>Provide food in city at energy efficient manner</i>	<i>Enterprise development</i>	<i>Reduces the emission of chlorofluorocarbon from cold storages.</i>
<i>Maintain the clean atmosphere</i>	<i>Gender equity in the profession</i>		
<i>Allows for emergency spaces during fire and earthquake disaster.</i>	<i>Social harmony and socialization</i>		
	<i>Jobs for old, female, unemployed and uneducated.</i>		

Agricultural services and improved livelihoods

Without appropriate and improved agricultural technologies and practices, and wider sharing of agricultural knowledge improvements in living standards and reductions in poverty will be hard to achieve in countries still heavily dependent on agriculture such as Nepal. However, it remains difficult for agricultural research providers to take on the multidisciplinary poverty reduction agenda as they feel a need to focus on working with farmers that both have the capacity and resources to engage with them effectively. Such farmers are rarely among the poorest, (HARP, 2008).

1.3 Policy

National policy has recognized National Shelter Policy (1996), UA and Livelihood in various plans of NPC. This is also in line with the national agriculture policy-2004 of Nepal that has stressed commercialization and

diversification of agriculture linking directly to food security and poverty alleviation. In keeping with this scenario, the urban agriculture approach requires addressing the following four major issues:

(I) environmental conservation and greenery (ii) increase in agricultural production/ productivity and employment, (iii) supplementary nutrients supply to food, and (IV) role of municipal government, (Pradhan, Pradhan, Walter, Folmor, 2008).

Provisional Local Shelter Act-1999

This act provides the division of urban areas into different categories on the basis of population, sources of income and other urban facilities. Each category differs in population and urban facilities.

1. Municipal corporation
2. Sub-municipal corporation
3. Municipality

1.4 Actors and their Roles

The government's role is to formulate policy; facilitate implementation through investment, loan and grant and technological inputs. Local bodies are responsible for planned development, **Millennium development goal** which is the global concept and cannot be fulfilled without acting in local level. Out of eight goals urban agriculture can help to attain the three goals viz. goal no.1 goal no.2 and goal no.7, (Raut, 2006).The following parties will have involvement on HUD. Government organization/Non government organizations/Individual owners/ Private sector/IOE, as Human Resource Development and Production/HDM Alumni Members.

2. Organisation

The Institute of Engineering, established in 1972, contributes to the production of technicians and engineers capable of meeting the national aspirations to accelerate the pace of development in the country. Besides this, the institute is also offering a wide range of services for benefit of the country. The institutional objectives of the Institute of Engineering are to produce different levels of engineering

manpower needed for meeting the national aspirations and goals. At present it is producing engineers and overseers as well as offering Master and Ph.D. studies in various disciplines. The second objective is to perform various researches and development works so as to strengthen the national engineering capabilities and solve engineering problems. The third objective is to offer training, sponsored courses, problem oriented research and engineering consultancy services. This objective caters towards greater mobilization of human and physical resources for the technical advancement of the nation.

I am working in the Institute of Engineering, Nepal as an Associate Professor under the Department of Architecture. As a woman professional and a woman activist I am very much involved in staff and student development; contributing to the various activities undertaken by the different centres under the institute. Besides teaching and being consultant for various projects undertaken by the institute, I have been serving since last thirty years by taking various administrative positions from deputy head of the department to assistant dean. Refer Annex – I, for IOE organization chart.

3. Urban Problem

Traditional Agriculture is not a recent phenomenon in Nepal; rather it is the backbone of Nepalese economy as a primary occupation and subsistence livelihood. But UA, green revolution, food green city and new green urbanism is a recent concept developed after the fast urbanization rate and loss of arable land. The farmers of Kathmandu live in compact settlement to save arable land resources. In the Kathmandu Valley the settlements are on higher land ('tar' land) separate from irrigated, rice paddy land. Generally, labour intensive work in irrigation agriculture requires well organized societies. This is the case for the Newars of the Kathmandu valley (Nepal, 1965).

The urban farmers in Kathmandu Valley are under pressure. This is both related to the loss of agricultural land due to urban expansion and in terms of their own living conditions in the traditional towns with fast increasing densities, and marginalization.

The historic glory of Kathmandu is the result of combined effort of agriculture and trade, but the rapid conversion of fertile agricultural land into built up areas

like residential buildings and commercial complexes has snatched the living of urban communities. The developing country like Nepal is unable to manage the unproductive landscapes in the urban area. Therefore the concept of intensive urban agricultural practices can reduce these problems on livelihood of urban communities.

Kathmandu is continuously growing both in population and property values and the availability of land is a significant obstacle to promoting urban agriculture in Kathmandu. Unlike other cities Kathmandu is almost completely built out. The market value of land is high and housing demand continues to grow. The low revenues produced by urban agriculture cannot compete with the market value of other forms of development. Land speculation in the peri-area is increasing threat to the occupation and letting no more spaces to the urban agriculture. Minimum exposure to the modern technology, training and high value crop is prevalent. Since no awareness about UA so contaminated land, polluted water, air pollution is problems of UA. At the same time larger food production by industrial authorities are cheaper and faster and it becomes a threat to UA.

Basic urban agricultural development facilities, such as storage, credit, extension and training services, transport and communication, and research activities are inadequately available. In addition, urban farmers are disorganized and scattered due to lack of organizations among themselves.

The issues to be answered are how the arable land in the urban areas can be conserved is a major issue with the following leading questions:

- how can the livelihoods of the communities with primary sector (e.g. agriculture) be sustained in urban area
- How can the aspect of new urbanism and urban greenery be integrated with urban living of communities at local level?
- How this approach can be beneficial for harmonious urban development?

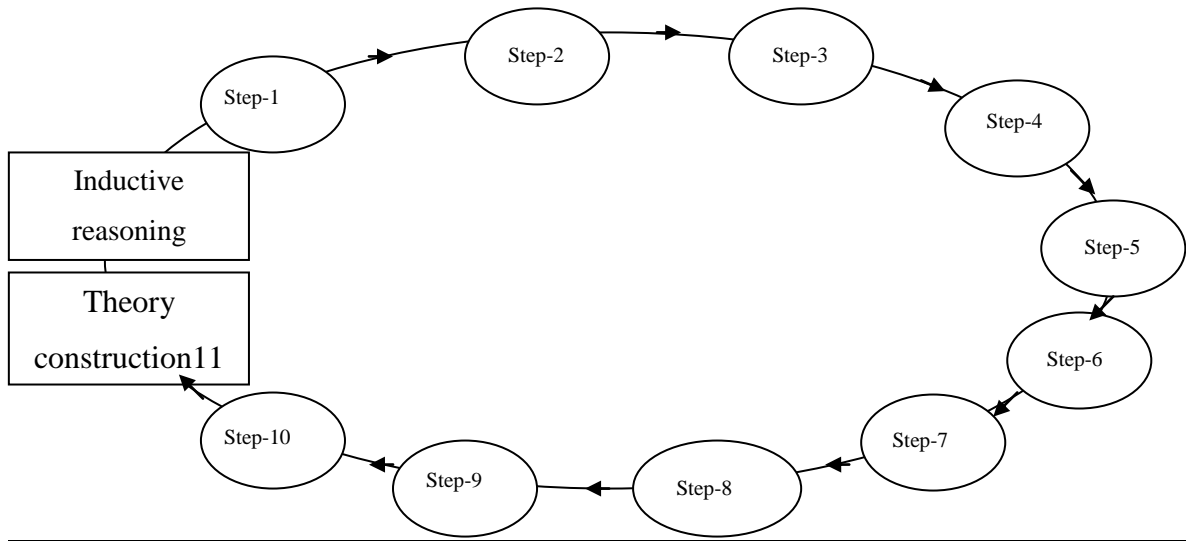
4 Proposals for Change and Improvement

In order to derive the proposal for change, case studies were carried out. And, further studies will be carried out in relation to the issues raised in the chapter of problem identification.

Methodologies for mini research

The case study area was selected from two communities each from Kathmandu and Lalitpur to conduct a mini research on livelihood from urban farming.

Research Steps



Assumed that the pattern and crops growth vary by location, social feature and urbanization rate, so two different sites were selected, Kirtipur and Lubhu. Inductive method of reasoning was applied and post positivist paradigm for history, observing agricultural communities, existence and constructivist paradigm for observation inquiry and understanding of the past and reconstruction of a theory in today's context was adopted. Chiefly qualitative methods used but to support and expand upon qualitative methodology quantitative methods for sampled households as:

Compiled sample size was calculated as:
$$n = \frac{N}{1 + N(e)^2}$$

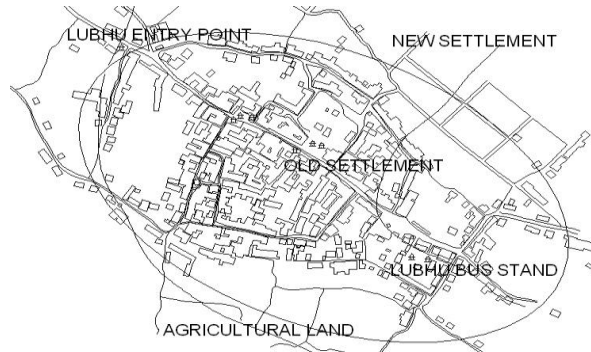
Where n is sample size, N is population / household (e)² is sample error.

For mini research Deu-Dhaka ward no 2, in Kirtipur and Lubhu ward 3KA was chosen to study how many urban farmers are still in farming and depending on UA.

Study Area – One

The urban fabric of Kirtipur combines the elements of a multiple village with features common to the three cities of the valley. The tentative urban contours are

CORE, URBAN, SEMI-URBAN and PERIPHERI. But in Lubhu CORE, URBAN, and PERIPHERI.



STUDY AREA – ONE (Kritipur)

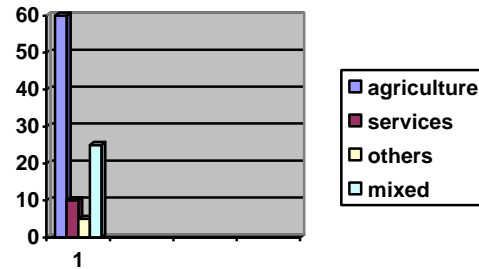
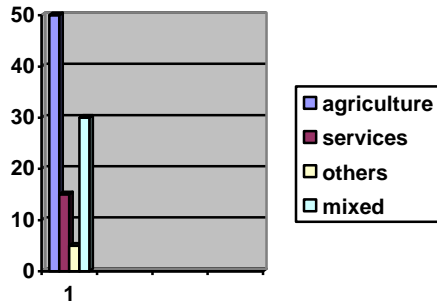
1. Kirtipur- Deu Dhoka, ward no.2

- Total population- 250-300
- Total house hold- 40-50
- Fertile Land
- Main crops are rice, wheat and maize
- Homogenous community (Maharjans), Ten interviews)
- Three-Key Informants
- Different age-groups and gender

STUDY AREA – TWO (Lubhu)

2. Lubhu- Data Analysis Ward-3-KA

- Total population 7000
- Area - 7.45 km².
- Language - Newari & Nepali
- Highly fertile Land
- Three Interviews
- Different communities Different Age Group (male)
- Main crops are rice, wheat and maize



Empirical Findings of the research (Refer table 3 annex-1)

- People more than 50%-60 are still depending on agriculture without land management and land conservation.
- Traditional spaces are lessening by new built-up areas.
- The need of spaces is less as the agricultural products has reduced.
- Mutual co-operation between and among all is still continuing at the time of festival, religious events, labour works etc.
- Sharing public spaces is not a problem due to less productivity
- The domestication of animals and birds is largely reduced so less tension and disputes among the Families and communities.

- The secondary livelihood options are mixed for example shops, rents, missionary, and carpentry but primary is agriculture. Little need of spaces, as the agricultural products is less.
- The secondary livelihood options are mixed for example shops, rents, missionary, and carpentry but primary is agriculture.

Application, Discussion and Conclusion

- Participation by both new comers and old-timers in protecting local farming and farmland, together with better land use (locals and policy makers).
- Urban Agricultural communities are those whose primary livelihood is based on the agriculture and due to labour intensive work, they need well-organized societies, like Newars of Kathmandu valley. So co-operation among the farmers is need for social harmony and cultural continuity.
- Agriculture based models not only enough, modern farming, fast crops is needed for SL.
- The key public policy challenge thus for many such communities is how to balance the two, to profit from urban growth without destroying the traditional environment and harmonious UD.

From the empirical data the urban communities are still depending on Agriculture. So conservation and protection on remaining urban land be preserved for SL.

The role of socialization becomes important in keeping traditional harmony due to common and mutual help.

The goal of the exploration of the public land inventory therefore is to identify vacant or under-utilized space for urban agriculture uses on city-owned property. The city owns a number of currently unoccupied properties in a variety of locations and settings that have great potential for urban agriculture. Using these properties in urban agriculture offers many benefits to local community nearby.

From the study it is found that two different types of urban agriculture viz. traditional relay cropping and modern integrated farming can be introduced in the case study areas.

From the primary data analysis, field observation, informal discussion with the local inhabitants, potential of urban agriculture for Sustainable Livelihood of

Urban Farms in Kirtipur and Lubhu at Kathmandu is assessed with the SWOT analysis as described below.

Strength	Weakness	Opportunity	Threat
<i>Close proximity to market centres</i>	<i>Agricultural activity is not formally recognized.</i>	<i>Employment to all House Hold members.</i>	<i>Decreasing order of agricultural land</i>
<i>Availability of river water for irrigation</i>	<i>Difficulty in access to land</i>	<i>Learning centre and research for the student/Teacher</i>	<i>Demand of land tenure right from the farmer</i>
<i>High fertility land</i>	<i>Increased land pooling for housing and land fragmentation among communities and family.</i>	<i>Possibility of integration of vegetable and livestock.</i>	<i>Theft and vandalism</i>
<i>Greenery through agriculture</i>	<i>Lack of municipal land use map</i>	<i>Save the public land from squatting</i>	<i>Contamination to river water cause entrophication problem</i>
<i>Employment opportunity for the migrants and local Farmers</i>	<i>High yield motor vehicle bore air pollution, NO_x, SO_x, HC, PM, Pb, secondary pollutants O₃.</i>	<i>Saving the transportation cost of waste.</i>	<i>Haphazard urban expansion.</i>
<i>Existence of traditional skills for intensive farming</i>	<i>Lack of institutional mechanism.</i>	<i>Health benefits to the elder people and First hand access to nutritious food for the urban poor.</i>	<i>Younger generation from the urban inhabitants not interested in agriculture.</i>
<i>Availability of small scale financial cooperative organization</i>		<i>Conversion of urban waste land into productive one</i>	

From the SWOT analysis it is revealed that there is high possibility of urban agricultural activity by integrating it with urban ecological system, which will strengthen to Harmonious Urban Development.

5. Personal Action Plan

My personal action plan reflects activities at the government level and at the institute level (University) I am engaged with. The actions are divided as short term and long term.

Action Plan with the Government Agencies

Government, Physical planning authorities, National planning commission & others

Short term (2009)

Harmonious Urban Development awareness programmes throughout the nation with slogans like:

- Local production local use.
- Agricultural services and improved livelihoods

Through

- Government Agents
- Institutions and Private, NGOs, INGOs
- Alumni Members

Community Mobilization: Community centres and garden educate the community to see agriculture as an integral part of urban life.

Long Term (2013)

Sensitization workshops on the themes such as:

- Urban Agriculture as a tool for poverty reduction.
- Integration of UA in Planning and develop concept of food green city.
- Coordination of government partners and other Institutions, Associations, CBOs, NGOs, INGOs and private sector to impart proper knowledge among them for better policies and uses.
- Financial support to the lower income groups and urban poor through the help of government & private banks.
- Increase women access to land and maximum involvement of Professional as well as grass root women in urban agriculture

Action Plan with the Institute of Engineering

Short term (2009)

- Situational Analysis of existing land and dependency rate on farming in urban areas through the Staff and student.
- Conduct researches on the theme by mobilizing PhD, MSc. and Bachelors students of Department of architecture.

Long term (2013)

The proposals will be forwarded through the department at four levels as a research thesis, to the government, University, Institute and Local government under various activities such as:

- Policy recommendation and provide training for arable land conservation and preservation.
- Revision of syllabus and introducing the UA facts and findings where necessary suggested by the related departments, centres and from other trainings.
- Create a sub-unit under IECS (consultancy Services) advocating UA for SL and HUD.
- Conduct interactions among stakeholders about UA for SL of urban farmers/poor and concept of food green city and Harmonious Urban development

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* Various Seminars, Dialogues, Networking and Round Table themes/conclusions from the WUF4 is included and will incorporate more before presenting to the institute (Department).

* For Operational Definition, Acknowledgement, Abbreviation/Acronyms and other references, see Annexes.

Annex-I: Tables for main text

Table-1 : NLSS Survey of 2003/004

Description	Nepal Living Standards Survey	
	1995/96	2003/04
<i>Percent of Population (0-14 years)</i>	42.4	39.6
<i>Percent of Population (15-59 years)</i>	50.8	52.8
<i>Percent of Population (60 years and over)</i>	6.8	7.6
<i>Sex Ratio (Number of males per 100 females)</i>	95.5	92.3
<i>Dependency Ratio</i>	97.0	89.2
<i>Household size</i>	5.7	5.3
<i>Percent of female headed households</i>	13.6	19.6

Table-2: NLSS Survey of 2003/004

	2000	2004	2005
<i>Fertility rate, total (births per woman)</i>	4.0	3.5	..
<i>Mortality rate, infant (per 1,000 live births)</i>	69.0	58.6	..
<i>Mortality rate, under-5 (per 1,000)</i>	95.0	76.2	..
<i>Births attended by skilled health staff (% of total)</i>	11.9	15.0	..
<i>Malnutrition prevalence, weight for age (% of children under 5)</i>
<i>Immunization, measles (% of children ages 12-23 months)</i>	71.0	73.0	..
<i>Prevalence of HIV, total (% of population ages 1-49)</i>	0.5

NLSS 2003/04 reveals that the percent of population in 0-14 year's age group has decreased slightly from 42 to 40 that in 15-59 years age group has increased from 51 to 53, and that in 60 years and over age group remained about the same in the last eight years. Dependency ratio, sex ratio and household size exhibited a decreasing trend during the same period while the proportion of female-headed households increased from 14 percent to 20 percent. NLSS 2003/04 results are generally comparable with those of Population Census 2001.

Table 3: Population Distribution of Lubhu VDC by Occupation and Monthly income

Occupation	Monthly income				
	Male	Female		Male	Female
None					
Agriculture	24.7	48.0	Less than 2500	15.3	17.6
Job holder	10.7	2.0	2500 - 5000	32.7	15.4
Service/Business	6.0	2.7	5000 - 10000	6.0	4.4
Industry	2.7		More than 10000		
Daily wages	2.0	1.3			
TOTAL	46.0	54.0	TOTAL	54.0	37.5
N	69	81	N	81	51

Source: final year –2060 batch- conservation project

From this table one can see the women are more involved in UA than males, and the monthly income less than male.

Table- A1: Nepal Data Profile

	2000	2004	2005
Population, total	24.4 million	26.6 million	27.1 million
Population growth (annual %)	2.3	2.0	2.0
Life expectancy at birth , total (years)	60.5	62.2	..

Source: World Development Indicators database, April 2006

Table- A2: Economy

	2000	2004	2005
GNI, Atlas method (current US\$)	5.4 billion	6.6 billion	7.3 billion
GNI per capita, Atlas method (current US\$)	220.0	250.0	270.0
GDP (Current US\$)	5.5 billion	6.7 billion	7.3 billion
GDP growth (annual %)	6.1	3.4	2.3
Inflation, GDP deflator (annual %)	4.6	5.0	4.6

Source: World Development Indicators database, April 2006

Table A3: Distribution of households by occupancy

	(Percent)				
	Owner	Renter	Rent-free	Other	Total
Urban	72	23.5	3.8	0.7	100
<i>Kath. Valley</i>	62.5	33.1	3	1.4	100
<i>Other</i>	77.2	18.2	4.3	0.4	100

Table A4: Average number of rooms and average size of dwelling

	(Percent)		
	Average Number of Rooms	Average size of Dwelling (Sq.Ft.)	Average Area of Housing Plot* (Sq.Ft.)
Urban	4.5	584.0	1448
<i>Kath. Valley</i>	4.8	589.0	1162
<i>Other</i>	4.3	581.0	1606

Table A5: Percentage of households with access to various facilities (percent)

	Electricity	Telephone	Sanitary System	Garbage Disposal	Toilet
<i>Urban</i>	87.4	31.9	54.4	45.0	81.3
<i>Kathmandu Valley</i>	99.1	51.3	98.1	83.0	98.9
<i>Other</i>	80.9	21.2	30.4	24.1	71.6

Table A6: Population Projection of the Kathmandu Valley

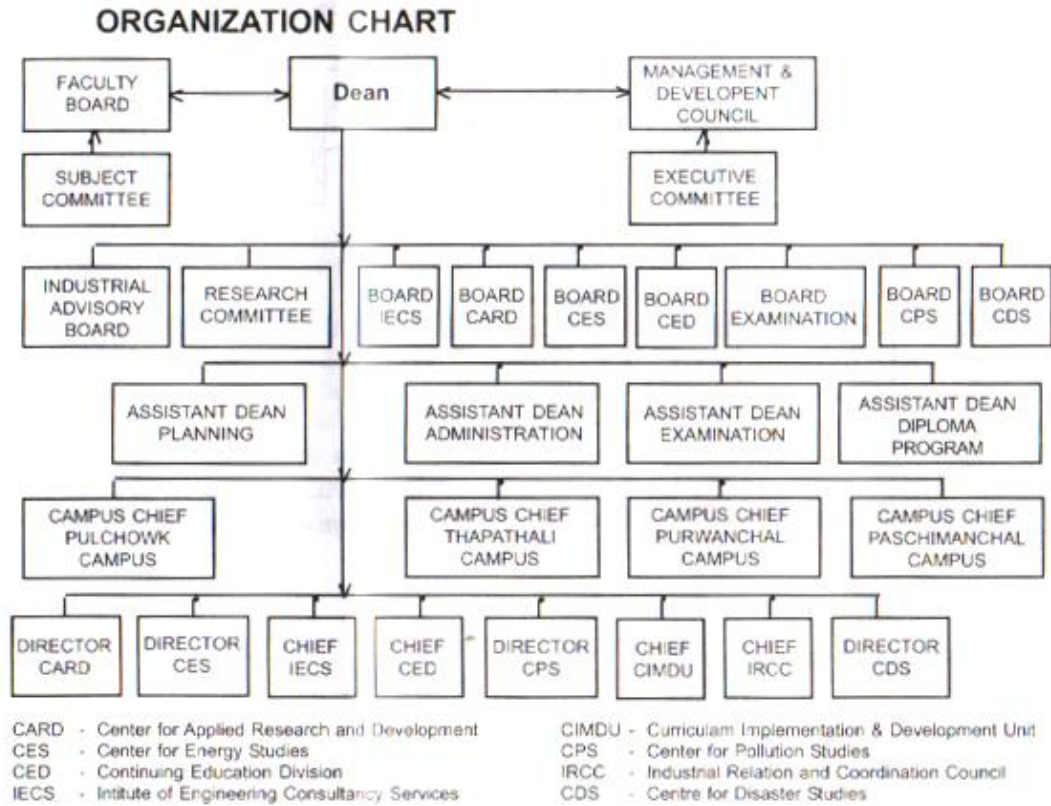
Items/Year	2001
<i>Population of Valley</i>	1618159
<i>Households number</i>	318630
<i>Average person per household</i>	5.08
<i>Population Growth*</i>	3.834%

Table A7: Population Projections

Estimated population for 2011	2357312
Estimated population for 2021	3434100
Population increase from 2001 to 2021	1815941
Population Growth*	3.834%

Source: Census 2001 (for population)

Population growth: is calculated from census data 1981 (population 740619) and 1991 (Population, 1078909).



Annex-II: The Role of Valley in Agriculture

The aggregated yield for three main crops rice, wheat and maize in Kathmandu valley between 1967/68 to 1982/83 have increase from 2.2 ton to 3 ton per hectare while the aggregated national product for the same period declined from 1.83 ton to 1.77 (PADCO, 1986).

Rice production is the major rainy crop in the valley followed by wheat and maize in winter season. The yield per ton per hectare for rice was 3.49 in 1982/83 significantly higher than national average of about 108 tons per hectare. The aggregate production of three crops had increasing trend between 1967 to 1977, fell sharply because of bad weather during 1977-79 and recovering in 1981 to a increase of 32% production over 1967/68 (PADCO, 1986).

The cultivatable area for main crops despite of reduction by 12%, their combined production increased considerably. The total production even goes more when added with minor crops like, barley, millet, potatoes and so on.

The aggregate production of major crops in 1967/68 and 1982/83 accounted for 4.32 percent of national production and about 3.4 percent of total of total cultivated lands occupied by these crops. The food balance estimate of valleys shows there is surplus of 3% of the food grain needs in 1971/72. By 1974/75 and 1980/81, the districts produce 98% and 97% of the food grain needs. However, latter year's trends shows that Kathmandu valley declined in producing food grains.

Land System in Kathmandu Valley

LRMP data shows 17% of valleys land is occupied by alluvial plains while river channels make up about 1.4% of the land area, Principle Rivers being Bagmati, Bishnumati and Manahara. The alluvial lands are most productive lands, irrigable and intensely cultivated. Another land system of the valley is tar lands. They are elevated lands and are flat plateau-like land forms and are separated by flood plains.

Land Capability

LRMP land classifies Kathmandu valley into three classes, the class I, having little limitation on agriculture is the land consists of alluvial plains and undersexed

tar lands making up 34% of valley area. Class I land is fertile and very productive and intensively farmed. The urban areas of valley mostly fall in this area. LRMP map reveals about 14% of class I land was occupied by urban use in 1979.

Class II land consists of dissected tar lands and alluvial fans and makes up 22% of valley land. Soil is deep and well drained. Class II land lies towards the outer limit of the valley and some northern parts. The class III and IV land consists of sloping and mountainous areas and conversion of agriculture land.

The built up area of greater Kathmandu which comprises of Kathmandu and Lalitpur Municipal area, increased by 88% from 1971 to 1981, a growth rate of 6.52%. The growth resulted in a loss of about 1500 ha of agricultural land. In 1979 the urban areas occupied 2850 ha of land which is 14% of class I land. Despite urban growth started to have impact on class I land, more than 90% percent of agricultural land was still left.

However, the situation in the greater Kathmandu, between 1981 and 1991 shows significant changes in agricultural land. The urbanized area increased to 7195 ha showing a loss of 4345 ha of fertile land in the process of unplanned urbanization in the valley (HMG/IUCN, 1995). During 1971 to 1991, the urban area has increased to three times. An EMAG study (1992) estimated that about 150 ha of fertile land are lost every year for urban purpose. Between 1984 and 1994, urban area in the valley increased from 3096 ha to 8378 ha and 5282 ha of agricultural land is lost (HMG, 1999).

Annex-III: Acknowledgement

I would like to take this opportunity to express my sincere gratitude to all who supported and helped me in preparation of my presentation. I would like to express my sincere gratitude to Prof. Johnny Astrand for his guidance through mail, creating Lund platform and providing necessary suggestions and support. I like to thank Lena Andersson for providing administrative assistance. Annette and Laura for necessary correspondence.

I also acknowledge with gratitude the support received from Mr.Arjune Koirala, Mr. Sanjay Uprety, Mr Shyam Khadka.

In preparing this draft, numerous organization and individuals have been contacted, interviewed and they all deserve sincere thanks for unconditional help by making with relevant documents, data and information. The words of acknowledgement will not complete without thanking to Sida, HDM and Lund University.

Last but not the least, thanks to all my friends and familiars who helped me and supported me in many ways.

Madhura Karki

2008

Annex - IV: Abstract

The objective of HUD-4 is to improve living standards for poor people in developing countries and thus alleviate poverty. Awareness of sustainable UD and support poverty alleviation. Considering the given objective I like to concentrate on the UA for SL of U farmers to meet the goal of HUD. In my opinion UA is one of the main elements of HUD. For better understanding I have tried to collect an Empirical data on livelihood of urban farmers/poor of two Neighbourhoods, each from two traditional cities of Kathmandu. I did a small mini research. To asses how the lives of urban farmers are threatened due to haphazard growth of new built up structures loosing the arable land, whose primary occupation was agriculture.

1. This research based paper will be action oriented since the involvement of M.Sc. student, also this will be developed as a research thesis for T.U. and recommendation to the govt. is the ultimate goal.
2. The new knowledge on UA, livelihood for SL towards HUD will be prioritized, categorized and involve student, fellow colleagues, and university fellow researcher. Planner local and national government is the main aim.

ANNEX - V: Abbreviation/Acronyms

ADB	Asian Development Bank
ACDPL	Ansal Chaudhary Developers Private Limited.
CBDM	Community Based Disaster Management
CBS	Central Bureau of Statistics
CDO	Chief District Officer
DDC	District Development Committee
DDC	District Development Committee
DHUD	Department of Housing and Urban Development
DHUD	Department of Housing and Urban Development
DIPECHO	The Disaster Preparedness Programme of the European
DUDBC	Department of Urban Development and Building Construction
EWS	Economically Weaker Section
GDP	Gross Domestic Product
GLD	Guided Land Development
GoN	Government of Nepal
Ha	Hectare
HDFC	Housing Development Finance Company
HIG	Higher Income Group
HRD	Human Resource Development
HUD	Harmonious Urban Development
HUDCO	Housing and Urban Development Company
IAP	Integrated Action Plan
ICIMOD	International Center for Mountain Development
NGO	Non Governmental Agency
NHS	National Housing Survey
SL	Sustainable Livelihood
SYB	Statistical Year Book
UA	Urban Agriculture
UC	Urban Communities
UD	Urban Development
UF	Urban Farming

UL	Urban Land
VDC	Village Development Committee
WB	World Bank
1 Anna	4 Dam = 31.80 m ² .
1 Dam	4 Paisa = 7.95 m ² .
1 Hectare	19.6 Ropani = 10 000m ² .
1 Ropani	16 Anna = 508.74 m ² .

ANNEX - VI: Operational Definitions

Urban Agriculture

"Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying, (FAO).

Livelihood

In a broad sense livelihood denotes all the means that are needed for human beings to live. People's livelihood refers to social, economic, political, physical, and ecological attributes where people have been living and getting their livelihood out of complex settings. Putting it succinctly, livelihood comprises the capabilities, assets and activities required for a means of living (www.livelihood.or-6/22/2002).

Sustainable Livelihood

A livelihood is sustainable that can cope with and recover from stress and shocks, maintain and enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation. It must also contribute net benefits to other livelihoods at the local and global levels in the long as well as short terms (Chambers and Conway [1992] adopted in DFID, 2000:1.1). The Brundtland Commission (in 1987) also introduced sustainable livelihood (SL) in terms of resource ownership and access to basic needs and livelihood security.