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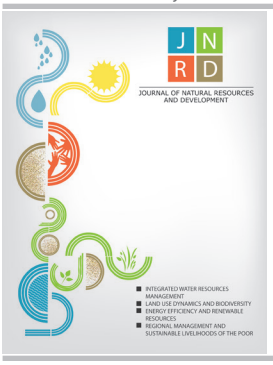

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Multifunctional Peri-Urban Agriculture and Local Food Access in the Kathmandu Valley, Nepal: A Review

Shreema Rana [a]*, R. Rijanta [b] and Rini Rachmawati [b]

[a] PhD Candidate, Doctoral Program at the Faculty of Geography, Universitas Gadjah Mada, Yogyakarta, Indonesia

[b] Faculty of Geography, Universitas Gadjah Mada, Yogyakarta, Indonesia

*Corresponding author: ranashreema@gmail.com or shreema@mail.ugm.ac.id

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Abstract

Based on the threatening global challenge of increasing urban population with decreasing resources to feed them, the existing literature is reviewed in this paper to highlight; i) the urban food supply chain, and ii) food security as a benefit of Peri-Urban Agriculture. This is deployed to fit the context of the developing regions of the world where urbanization does not occur in an organized manner. It is known that food grown in peri-urban areas (defined as the fastest growing areas that surround cities but are neither urban nor rural in the conventional sense) is easily available to urban inhabitants. Such peri-urban areas have the least adverse effects on the environment from a food transportation perspective and are more resilient in times of uncertain physical (disaster) and socioeconomic (fuel and food price rise) pressures. Today, much fertile peri-urban land is converted haphazardly without considering its environmental value and agricultural potential. Likewise, peri-urban agriculture is still in the process of being acknowledged by both locals and policy-makers despite being an accepted mode of achieving food security. Therefore, this paper seeks to orient the review literature and underline the gaps that prevail at the grass-roots level of local preferences and values and at the policy-maker level. Using extensive literature review as the methodology, this study draws recent ideas on the multi-functionality of peri-urban agriculture and the sustainable contribution it makes to both developed and developing countries around the world. The findings of the review highlight the significance of peri-urban areas in the Kathmandu Valley for a sustainable and a reliable food chain. It also shows the existing but unrecognized features of peri-urban agriculture both at local and policy-making levels. It discusses the point of interest and possible extension of the multifunctional peri-urban agriculture for local food access, inviting further research to better analyze ways of transition towards sustainable peri-urban agriculture approaches to deal with uncertain food insecurity problems in urban areas.

Contents

1. Introduction

Food security and Benefits of peri-urban agriculture (PUA)

Population increase is putting a lot of pressure on the environment and resource use around the world. With increasing populations in urban than rural areas **[1]**, there are fewer people and places producing food in fertile and highly productive agricultural land. This means with agriculture-inconsiderate urbanization, food demand will increase making people more susceptible to rising food prices and dependent mostly on imports for daily food needs. Being dependent on imported food may not be reliable all the time especially in case of countries which are geographically land locked and economically weak. It is therefore essential to analyze both the immediate and future effects of food insecurity related to urban problems and planning to ensure more sustainable development. A popular British scholar Malthus made a prediction in 1798 that food supply would be one of the greatest obstacles for development with the ever rising population dependent on existing resources **[2]**.

Today, food security together with climate change is giving a rhythmic output **[3]**. With the rising temperature there may be increased number of pests, insects, diseases and water stress, hindering agricultural activities **[4]** and leaving limited areas for growing food. The importance of food close to consumers is being recognized and is seen as a promising alternative, due to the limits on food growth and the difficulties in importing food all the time **[5]**. A case in one of the regions in Yogyakarta Indonesia mentions the importance of food production near to residential housing and the alternative role it can play in the era of rising food and fuel prices **[6]**. The recognition of the valuable agricultural land in the peri-urban areas remains slow, not just in Indonesia but also in the capital of Nepal which is comparatively very small and still in the process of urbanization. Taking a closer look at the case of Kathmandu Valley, its urbanization trend is not illustrative and is not guided by land-use plans and policies **[7]**. The Research Center on Urban Agriculture and Food Security, RUAF, presents the success stories of both developed and developing countries like Europe, Latin America, West Africa, South East Asia, China etc. practicing urban and peri-urban agriculture **[3]**.

Past experiences in the Kathmandu Valley did not focus on self-sustainability but on distributional justice in the ancient town planning activities **[8]**, where there was enough food for all and the surplus was bartered for other goods and services. Today, the urban centers in the valley are expanding into the surrounding fertile agricultural areas, exceeding the carrying capacity and becoming unsustainable with haphazard growth. Historical urban development in the Kathmandu Valley includes a distancing between the urban centers and rural land with agricultural hinterlands, peri-urban areas, known to be very fertile agricultural land **[9]**. The growing settlements were directed to new areas to preserve this agricultural land. The importance of agricultural production in the course of growth and planning made the process of settlement growth as Agricultural Urbanization **[8]**,**[10]** in the past in the Kathmandu Valley **[11]** . Today, those preserved peri-urban areas compete with the non-agricultural activities **[8]** such as brick factories, depots for sand, bricks and other construction materials, housing with higher rents, commercial complexes, plotting of fertile agricultural land for individual house plots, especially for immigrants from rural areas of Nepal, etc. As a result, the fertile agricultural peri-urban areas are not considered in decision-making and land-use planning policies and are in continuous conversion despite their potential **[12]**,**[10]**. The fertile agricultural land and farmer's offspring who still practice agriculture are becoming displaced without conscious planning and thought for ecological sustainability **[8]**. Therefore, it can be seen that Peri-Urban Agriculture (PUA) provides multifunctional opportunities **[13]** but still lacks support from government plans and policies for its advancement and placement as a parameter for sustainable development. The Ministry of Land Reforms and Management of Nepal stated in one of its national presentations that the urban centers of the Kathmandu Valley sprawling over the peri-urban areas will have an adverse effect on the existing facilities and infrastructures, with traffic making the place more incongruous to live **[14]**. The ecological footprint can be taken as a vivid example of environmental injustice to meet global food demand **[15]**. It can be significantly less with adoption of PUA due to its short food supply chain for urban buyers from the place of production.

The most striking feature of urban agriculture, unlike rural agriculture, is that it integrates into the urban economic and the urban ecosystem **[16]**, **[17]**. According to **[18]**, about 200 million urban/ peri-urban residents produce food for the urban market, providing 15 to 20 %

of the world's food. The Kathmandu Valley in Nepal is made up of three districts named Kathmandu, Lalitpur and Bhaktapur, covering an area of 569.80 square kilometers/ 220 square miles. The literature review research of Kathmandu Valley under urbanization reveals many agriculture-based small traditional towns and villages in the periphery of the urban centers **[19]** namely Kathmandu Metropolitan city, Lalitpur Sub-Metropolitan city, Bhaktapur Municipality, Madhyapur Thimi Municipality and Kirtipur Municipality. Among the districts Kirtipur and Bhaktapur have more agricultural lands followed by Lalitpur then Kathmandu the least **[20]**. A study carried out by the Kathmandu Valley Town Development Committee in 2001 shows that 32% of the valley was covered with forest, 40% with agriculture, and 17% with rural setting where every household has its own vegetable garden apart from farmers, and 11% with municipal areas **[21]**. The aforementioned 17% are also known as Village Development Committee (VDC) in the Nepalese context; trending into municipality with the same rural settings. In peri-urban areas of the valley, agriculture is still the means of individual household food security as well as the source of their income in terms of primary and secondary occupation. Conversely remittance from overseas is becoming another major source of income for many families today which only solves finance related problems **[22]**. Today much of the agricultural land is also left barren and only a few youngsters from agricultural households are fully engaged. According to Bhatta **[23]**, the occupational shift taking place in Kathmandu Valley is due to the unrecognized diverse agricultural potential and lack of government support for modernization in agriculture practices. It is necessary to investigate the significance of the natural prevailing potential of PUA in Kathmandu Valley and recognize the nexus between agricultural activities and sustainable development. As mentioned by Rijanta **[6]** in his research, it is very important to recognize the existing strengths, in terms of skills and knowledge, of local people for sustainable development. Such prominence of treasuring the local production in Yogyakarta in Indonesia has also been recognized by local as well as central government. Likewise, it is vital in the case of the Kathmandu Valley to transform in order to become sustainable in the face of rapidly growing urban population, food demand, climate change and economic crisis. In this case it is not just the majority of people already engaged in agriculture with mixed practices but also the existing agricultural biodiversity of the valley. The unique soil formation of the Kathmandu Valley makes its agricultural land more productive **[24]** and it needs to be tapped to achieve sustainable development. A holistic system approach in view of the environment and its ecological entity are to be adapted and scaled up for the Kathmandu Valley where food importation is not a wise option considering the majority of disadvantages to groups of the population. The Nepal Living Standard Survey (NLSS) showed that the share of food in total expenditure of the average Nepalese household is about 59% and about 65% for those who are living below the poverty line **[25]**.

On the other hand if it is positively looked at, sustainable upgrading is also taking place at the community level **[26]**. Traditionally irrigation in the valley was only rain dependent but now wastewater accumulated in shallow ponds and canals is being used. These canals collect water from the community's waste, also known as grey water. Such techniques of water reuse for agricultural purposes have been witnessed in some peri-urban areas **[19]**. This exemplifies the local adaptation to climate change in terms of the water crisis. The participation of women is highlighted in the role of adaptation, at a household level biodegradable waste is used in agricultural fields as organic fertilizer/compost.

Ultimately all plans and policies for any kind of development including sustainable development cannot be formulated or implemented without government and political interest, since all development aspects are controlled by integrated policy and socialized by the government as policy-maker to local communities **[27]**, **[28]**. This is also the case for the transition towards sustainable development considering PUA in the Kathmandu Valley. The land use system in respect to agriculture practices requires good policy and planning, integrating the potential of sustainable PUA **[29]**. There are many complications, such as political atmosphere in policy-making, job overlapping by different stakeholder, dynamic changes in natural order, and dynamic preferences in local communities which is never dealt until the root level despite knowledge of the alternative **[5]** offered by the multifunctional characteristics of 'PUA'. In the Bhaktapur district of Kathmandu Valley, Madhyapur Thimi made a municipal master plan towards local food access by preserving the remaining agricultural land, which is fertile and has higher yields compared to others, by working in harmony with the Nepal Agriculture Research Council (NARC) **[30]**. These prospective and positive indications demand transition towards sustainable peri-urban agriculture which may be the best measure to accomplish the wellbeing of the people all the time and a more sustainable food chain.

Objectives and methodology

This review paper examines scientific journal discussion and empirical perceptions of the transition to sustainable peri-urban agriculture (PUA) in the Kathmandu Valley. The multifunctional features of PUA including capabilities to combat food insecurity prove its importance, especially for those developing countries incapable of purchasing/ importing food all the time due to weak economic status. However, the transition to sustainable PUA is not taking place in the desired ratio **[31]**, especially in developing or less developed nations. The countries which are urbanizing haphazardly with increasing population and weak economies are most vulnerable to food related problems. These countries are directly dependent on natural resources and agriculture for food. This paper investigates the obstacles in the transition to sustainable PUA in the case of the Kathmandu Valley in Nepal. It is a less developed country experiencing unplanned growth with depleting fertile agricultural land. The depletion is due to existing land use policies and varied interest in peri-urban land which do not recognize agriculture and its importance. The relevant literature in this paper is arranged with a focus on the multi-functionality and shortened food supply chain of PUA with its integration into land use policies and people's preferences, including both farmers and buyers, highlighting its problems and prospects.

The theoretical framework is explained in the sections below with its

potential to achieve sustainable transitions on the basis of the literature review. The following sections (Multi-functional characteristics of PUA) explain the competition between PUA and non-agricultural activities in peri-urban areas of the Kathmandu Valley. The deficiency in the coordination of land-use policy designed at the top level along with the perception at the local community level will also be discussed. The section on short food supply chains shows the high demand for agricultural activities in the fertile peri-urban land of the valley above that of other urban uses. The following section also talks about the differences in the preferences for PUA in developed and developing nations. The former takes it as a mode of recreation and social activity, while the latter as a medium of cheap food and living **[32]**. Due to this difference, developing/less developed countries are found to be suffering more from urban/peri-urban land competition and the decision for its usage **[33]**. Therefore, this paper is a detailed investigation on the multifunctional characteristics of PUA with holistic benefits for the practitioners locally and globally. This section addresses the following research questions:

- *How does policy at the top and the local community at the bottom level contribute to the sustainability of peri-urban agricultural land with multifunctional characteristics?*
- *Why are the factors of PUA that enhance sustainable transition not practiced?*

The last two sections of the review paper are the discussion and conclusion of the relevant contribution of multifunctional PUA to local food access for food security. These sections describe the role of land-use policy as the significant element in the successful transition towards PUA.

Methodologically this literature review research is based on restatements of the scientific literature studies obtained from the university electronic journal database. The variations and amalgamations of the research keywords such as *'peri-urban agriculture', 'benefits of PUA', 'sustainable agriculture', and 'multi-functionality'* were carried out in the database. The sources from the literature make an important system in itself inside the large scenario of threatening global food issues under climate change and fuel unavailability fears which cannot go unnoticed.

2. Multifunctional characteristics of PUA

Land use policy

Prevailing policy is the driving factor in crafting people's perception and changing preferences. Land-use policies play a key role in directly or indirectly adding services and motivations. With the changing climate there are many problems in achieving food security and it will become tougher to accomplish without depleting natural resources and natural ecosystems **[34]**. The numerous stakeholders with diverse perspectives make decision-making a difficult process stressing the need of government and institutional bodies representing people, potential and resources. The effectiveness of strategies lies in the planners and policy makers in the decision-making while the implications are borne by the communities, their awareness and preferences. Agricultural Land Policies are formulated to cope with the pressure of using the same land for agricultural activity or other uses; in case of the developed countries like the USA to combat the sustainability of agricultural land with urban sprawl **[1]**, **[35]**. However, such integration is absent in the Kathmandu Valley. One example from China, with its alarming population growth, is the loss of over 5% of its agricultural land in 1990s **[36]** according to records. Hence, the Government of China initiated its 10th Five-Year Plan (2001- 2005) to protect the higher yield agricultural land in China which was diminishing **[37]** due to a lack of investigation into communal values for agriculture and the preferences of agricultural communities and buyers. In parts of the USA, urban planners, architects and landscape designers have become involved by transforming design to support community agriculture, designating areas for farms and also designing neighborhood and individual houses **[29]**, **[38]**, **[39]**. Peri-urban areas are an important entity in the symbiosis of urban and rural zones, forming an interesting mosaic of land with multiple land use and unique character **[40]**, **[29]**. From observations in the Kathmandu Valley, land brokers and housing development companies hold huge parcels of land in peri-urban areas for speculative purposes **[20]**, thus killing and fragmenting the potential of fertile agricultural land which cannot be recovered again. During the Panchayat era (1962-1990) the government was centrally driven and considered not effective politically; however, the valley's fringe was well preserved for agricultural purposes with a good yield throughout the year **[8]**. Later, with the Decentralization Act of 1982, development was decentralized with less coordination, resulting in haphazard growth over peri-urban land without considering the long-term effects of agricultural land conversion on food security of the valley. The shift of farmers to other activities also took place with the building of a ring-road that gave further impetus to urban expansion over fertile agricultural land. Agricultural occupations shifted to other service-oriented activities but the customizing of ongoing agricultural activities into a business was and is never seriously considered. This resulted in increased land value for purposes other than agriculture but never calculated the adverse impact on the status of farmers and food imports replacing native food production. The valley's development plans and policies were uni-focused on infrastructure in urban areas mostly guided by foreign aid and rural development activities for enhancing agriculture only **[41]** without infrastructure development (including schools and hospitals). This development strategy did not assist adaptation to the current issues of food access problems in the Kathmandu Valley **[42]** and raised dependence on food imports. The long-term development plan prepared by the Kathmandu Valley Town Development Committee **[21]** has envisioned conservation of agricultural land and ground water with no strategy for its implementation. Similarly, the Local Self-Governance Act (LSGA) considers plantations on either side of roads, protection of barren land with municipality bylaws and the development green zones, though it ignores the preservation of existing peri-urban

agricultural land which produces food for the valley **[43]**. The agricultural activities in the Kathmandu Valley still suffer from various infrastructural, institutional, technological constraints to sustain against the haphazard land conversion **[12]**. Such procedures hinder the transition towards sustainable PUA for sustainable food access. Therefore, urban land-use policy in the Kathmandu Valley requires improvement to satisfy food demand locally by best utilizing the valley's potential. Dahal **[44]** mentioned in his paper that poverty concentration in urban centers of the Kathmandu Valley is due to a decade long political turmoil in the country. Rural urban migration, which increased to secure lives and properties, led to population concentration in urban centers and increased the food demand with decreasing agricultural land at a much faster rate.

Hence, there is much to be done on a strategy level for the transition towards sustainable agriculture **[38]**; apparently the policies have a bare minimum of environmental standards **[15]**. However, there are explicit examples from developed nations in terms of policy. In UK legislation Nitrate Vulnerable Zones were declared, completely prohibiting manure with nitrate content. The Agri-environmental policies (AEP) is an example from the developed world where funds from agencies and ministries were utilized to enforce agricultural production and consumption with environmental values only. In the developed world, conversion to environmental-friendly agriculture is a growing concern among farmers, buyers and government policy-makers, leading to agri-environmental codes of practice and legislation **[15]**. There are buyers and logistics businesses that prefer only organic certified food for consumption. These are small but noteworthy steps taking place in food production and consumption, considering the potential and the health values. However, recognition and modification is yet to take place in terms of accepting sustainable PUA as a part of development and poverty alleviation agenda. Correspondingly, farmers, traders, sellers and buyers along with planners and policy-makers should also pay attention to the changing climate which reduces agricultural outcomes.

Community participation

Individuals, households, communities and government all come together to play a crucial role for the success of any kind of development **[39]**. For the transition towards sustainable PUA 'farmers as community' can play an imperative part for generating enthusiasm and improving commercial channels. The better performance of PUA requires a link with business as a prerequisite for harmonizing the role of each participant (farmers, sellers and buyers) ensuring steadiness, larger inclusion and ecological integrity.

According to **[45]**, community supported agriculture (CSA), i.e. a community mutually involved in agriculture and its business, is one of the best ways to eradicate poverty, ensure food security and provide quality nutritious food wellbeing. The participation may be in different arrangements, such as directly being farmers and indirectly by leasing land only for agricultural purposes, making compost from household waste, sellers linking places of production and consumption (distributing only local produce) and buyers who prefer locally grown products **[46]**. In the end, success lies in the perception and communal values of the community to ensure the win-win atmosphere **[26]**. For example, one way to ensure the consumption of agricultural production by giving incentives to continue agriculture are hotel businesses booking and buying directly from the farm (with no mediators). Consequently, there are also buyers who prefer only organic agricultural products due to the health benefits **[47]**. The availability and scale of such organic products are small, making them more expensive compared to others. In the case of Lubhu in the Kathmandu Valley, community participation has been the root cause of the successful implementation of the Water and Sanitation Improvement and Solid Waste Management Programme **[48]**. The community was bought in by creating enthusiasm through awareness programs in the beginning before the project. It can be said that public awareness is the basic mode for gaining effective participation. The same place, Lubhu, has integrative work where farmers and consumers work in synchronization by uplifting each other **[45]** and as a result farmers also get better prices for their products, gain financial security and are relieved of the burden of marketing. Thus, in the Kathmandu Valley agriculture has guided urbanization where farmer communities organized themselves in order to maximize and preserve fertile plain lands for agriculture **[8]**. There has been a conscious traditional and political step for ecological sustainability at the planning and policy-making level **[49]**. Fertile agricultural land was somewhat of a deity, a nature protector worshipped by all (non-farmers alike) **[49]**. Due to this sociocultural norm, the agricultural fields have not been encroached upon and the growing population has been directed to new places such as satellite towns which again have the same traditional principle of preserving the agricultural fields I the surrounding areas. Therefore, predominantly the Kathmandu Valley once had farmers who were dependent on agriculture as their major source of income, but now with the changing political and socioeconomic context these agricultural communities and agricultural urbanization trends have fallen apart. Therefore, this era of change and population concentration in urban centers requires urbanization practices that consider the existing potential of the place and people and do not overlook climate change and carbon footprint issues in urban food consumption processes.

3. Short food supply chain

Improved approachability to local markets and the establishment of short supply chains with farmers are the most talked about aspects in recent studies regarding peri-urban agriculture **[50]**. The development of food market composition with short food supply chains would be a remarkable achievement with a lower ecological footprint **[51]**. With the proximity to urban centers as a focus, PUA can provide an opportunity to restructure agriculture beyond industrial production **[52]** and consider the value to the environment and to health in food consumption. Similarly, Renting **[53]** argues that short supply chains and direct interaction between farmers, processors, distributers and buyers plays a significant role both in urban areas and peri-urban areas. Short food supply chains are the most notable and sustainable factor in comparison to expensive long

food supply chains. The Kathmandu Valley comprises about half the country's urban population because of the presence of cumulative infrastructure **[54]**. The link between farmers and buyers in urban centers is vital in the case of the Kathmandu Valley where all the urban residents cannot afford to buy imported food as in developed countries. In simple words it can be said that not everyone has the same purchasing power. The Nepal Living Standard Survey (NLSS) showed that the share of food in total expenditure of the average Nepalese household is about 59%, whereas it is about 65% for those who are living below the poverty line **[55]**. It clearly shows that people spend more than half of their income just on food. Foods from closer agricultural land are cheaper due to less transportation cost compared to other sources of food. The Kathmandu Valley now imports a share of vegetables, fruits and other food items from India and China, its neighboring nations, signifying ever increasing threats to food security **[56]**. This channel is unreliable as it depends on the unstable economy and is even more vulnerable in the time of disaster.

In the Kathmandu Valley, PUA farmers have knowledge of the environmental and social value of agriculture and its importance, but they still hesitate to accept it due to lack of policy motivation and incentives. This may be because of the absence of laws on the implementation of the formulated visions. The local food supply chain individually supports a household as the community does collectively over a large area **[57]** to achieve food security with other environment and socioeconomic benefits. From the urban buyers in developed countries, proximity to an organic agriculture area plays an important role, with its guaranteed quality and health value **[47]**.

Conserved peri-urban agricultural land with networks to both rural and urban areas remains beneficial during food price inflation, fuel rises and extreme climate change events. It can be the node which produces food for both rural and urban zones or as a processor for the food produced by rural areas to cater to buyers' demand. This strategically can help decentralized development with a food security perspective for the area. Thus, the opinion here is not just to achieve food security but to build the skills capacity not only among farmers; but also among every household to lead a sustainable livelihood **[58]**. Ultimately the juxtaposition of people's preference, policies and environment ethics can make the transition towards sustainable PUA for sustainable development and easy food access to all.

4. Discussion

Land development policy

Land is an important unit of built environment with multiple interests. Therefore, 'Land' is the entity of political interest for any activity and the platform where activities take place; it is to be under the control and guidance of the government **[59]**. Agriculture is the most important human led activity taking place close to land. It is important to find agriculture-related solutions in coordination with land use policy, legislative and institutional bylaws **[29]**. Therefore, it is clear that land and agriculture policy are very closely related and they need to be in sync in all places and at all times. The primal nature of the Kathmandu Valley along with its role as the political, economic and administrative center attract more people, causing an autonomous conversion of peri-urban fringes into built forms of any kind. This creates both social and physical problems bounded by political factors under human interaction and their preferences **[60]**. The quick profitable conversion of peri-urban land compared to other urban land use activity mean that PUA cannot compete. This is going unnoticed by policy makers **[61]**. According to Subba, urban containment policy gives a hope to the ability to manage any forthcoming urban crisis in the Kathmandu Valley **[14]**. As reviewed, land-use changes are the expression of policies and governmental issues. According to his report , existing land-use policy issues with regards to planning issues are somehow vague **[29]**. The policies and guidelines for land-use development have not recognized the potential of development based on people, places and the need for sustainable development. The local Ward, Municipality and Village Development Committee government is promoting autonomous development in these agricultural productive lands, taking the development out of synchronization with central bodies' rules and regulations. Thus, management and implementation are more difficult to regulate for the urban growth **[62]**, resulting in haphazard development with loss of fertile agricultural land which cannot be reclaimed.

There has been a dramatic change in land-use management in the Kathmandu Valley from the periods 1984-1994 and 1994-2000; with both Government rule as well as infrastructural change **[49]**. Improper urban development policy has caused an adverse impact not only on agriculture and other land but also on the environmental condition and the livelihoods of the area in the long run **[58]**. Conflicting policies from different government bodies regarding the land are also one of the factors effecting the conservation of productive peri-urban land. Nepal's Agriculture Policy of 2005 clearly addresses the importance of agricultural lands within the Kathmandu Valley and local agricultural products as an important part for the development of sustainable agricultural and food security **[63]**, **[64]**. On the other hand, the new building construction registration fees in these peri-urban areas are much lower, thus attracting migrants from rural areas. In the same policy document clause number 1.1 states that any use of agricultural lands for purposes other than agricultural will be discouraged and agricultural lands will be prevented from fragmentation. However, its application is very disappointment, resulting in development with no thought for the future or sustainable values. Therefore, surveying the people's preferences and investigating a nexus of agricultural and land-use policy for transition towards sustainable PUA is essential in both a local and a global context. Local food access through sustainable PUA can be one of many achievements in the holistic transformation towards sustainable development.

Preferences and values of the people (both farmers and buyers)

People's preferences decide their relationship and contribution to the environment we live in. The priorities placed upon the environmental are guided by the people's preferences. This very relationship is vital at a policy level as it affects the decision making process, paving the way for sustainable development. People's preferences and values

also reflect the lifestyle they want to live so as to make any decision implementable locally. Similarly, in the case of food demand, food preference are vastly different in developed countries in comparison to the developing world **[35]**. Preferences vary depending upon the individual people, society, problems, the intensity of the problems, location and of course threat. According to Bennett **[65]**, the course of achieving sustainable development also varies due to different social and environmental values; leading to different the actions, responses and risks. On the other hand there is a simple correlation for the government between decision-making and people's preferences for implementation. The preferences are guided by the set of policies and motivations including incentives the government bodies that attract farmers to continue agriculture and develop further. The preferences of land owners are driven by land-use policy in terms of benefits and incentives to use their land for agriculture. Farmers' preference to choose agriculture as an occupation requires policies and incentives guided by the immense dignity of farmers as food producers, concessions in seeds, organic fertilizers and marketing. Market is the key reason behind a farmer's preferences and the existence of the structure of production. Food demands attract PUA farmers because of consumption, better profit margins and viable economic activity. However, Adelaja **[66]** from his survey in New Jersey and according to impermanence syndrome adds that supporting farming is only part of the solution to stemming the loss of agriculture. Support for peri-urban agriculture and farmers' families, both economically and socially, is highly encouraged in the surrounding communities. Likewise the Kathmandu Valley in Nepal with diverse agriculture potential should have strong policies and legislation **[13]**, **[64]**. There should be a collective effort to reduce loss of agricultural land to development through beneficial taxation and deed restriction, as well as protection of agricultural activity when farmers, neighbors, and municipalities enter into conflict [66, 29]. Since land-use changes are driven by different economic, ecological and cultural values, peri-urban lands need to be viewed from both urban and rural perspectives **[40]**. Land is basically a limited resource and civilization has a considerable interest in it. As described above, urban (developed) groups view it as a commodity to be used for economic benefits but rural (lower income) groups view it in terms of nature's creation which helps people to survive and also provides income. Thus, both perspectives are important for a sustainable type of development.

Initially food from the nearest hinterland (agriculture land, local market) used to be bought, but now it is being bought from supermarkets where food travels miles, leading to fuel and energy usage. It reflects an unawareness and dependence on imported food despite the agricultural diversity in the case of the Kathmandu Valley. The transition towards being dependent on the food imports is questionable in the Valley's case, where people are born farmers and blessed with fertile productive agriculturally diverse land. With the world's organizations and forums working towards sustainable development, we should also follow its trajectories in our country's development visions and guidelines. This would help us not to lead our planners and policy makers and most importantly our next generation to dream other people's dreams but our own dream and to enhance our potential and resources. Therefore, in the political and institutional context of the Kathmandu Valley people's preferences and values should be embedded. These can easily be accustomed to and are closer to the people **[67]**.

5. Conclusion

As the summary of this research review, it is important to improve community-supported agriculture on the basis of culture, values, land potential and resource availability. The improvements to policies and guidelines should be directed locally and include measures for sustainable development. In case of the Kathmandu Valley, the existing challenges of the rapid and haphazard land conversion can only be resolved if sustainable PUA is given priority based on its potential. Of the many achievements of sustainable PUA, access to local food that is less dependent on fuel and energy can be achieved by shortening the food chain in the Kathmandu Valley/Region. This is only possible with integrated land-use and agricultural policies.

This review also states that the contribution of multifunctional PUA has alternative inferences for the people, government bodies and experts at the decision-making level. In order to meet sustainability challenges, each hierarchy of government needs to redefine its role by integrating local environment and promoting ethical conduct. It is very important to investigate and study the strategic process of decision-making not only individually but together by reviewing the coinciding themes for better planning and policy-making and implementation. In the case of a transition towards sustainable PUA, it is vital to recognize the section where the nexus of policies together can modulate to achieve one of the themes of the sustainable development agenda by establishing a resilient local food access system.

Consequently from the reviews of the relevant research it can be seen that the solutions to most urban problems are at the local level rather than the district or national level. It is also very important to recall the words of Blaise Pascal "*People are generally better pervaded by the reasons which they have themselves discovered then by those which have come into the mind of others*". Therefore, the transition towards sustainable PUA can be one of the sustainable themes applicable in cases like that of the Kathmandu Valley in Nepal for local food access. Therefore, it is difficult to imagine living others' dreams or lifestyles and it is hardly ever a success due to circumstantial differences. So, every solution should be based on the potential of the place and the people.

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