



Impacts of Land-use Transformation on Agriculture land in Afghanistan, Kabul city as case study

Hamidullah Amin¹, Mansour Rifaat Helmi²

¹*MSc. Urban and Regional Planning, King Abdulaziz University*

²*Lecturer at Architecture and Planning Faculty, King Abdulaziz University*

Abstract

The change in land-use over a certain period of time is inevitable. This paper investigates the issue of land use change on agricultural land that has become a phenomenon affecting the economy and environment in Kabul, the capital city of Afghanistan. Agriculture is the main economic source of Afghan cities, however, due to rapid population growth, population densification, and inability to apply Kabul city's master plan and regulations, a large portion of land cover transformed from agricultural areas to unplanned developments and have shifted the function of communities from productive societies into consumer and dependent societies. The study sheds light on Yakatoot as a study farmland area in Kabul city to present an alive example of what is happening in the reality of agricultural land in Kabul. Therefore, approaches for sustainable conversion of agricultural land in Kabul city is a vital quest that needs to be followed seriously. The study illustrates Afghanistan's land laws. It identifies the social, economic and environmental impacts of land-use change. This paper applies qualitative methods, where data and analysis worked by using field surveys, aerial photographs from Google Earth and data collected from CRIDA. It also investigates international experience regarding land-use change and sustainable solutions. Therefore, due to positive implications of urban agriculture practice as a feasible and sustainable approach to tackle the ongoing challenges related to land-use change in Kabul city, this paper suggests inducing this approach in Kabul city's master plan and other urban initiatives because it will not only lead to environmental protection, but also, it will re-establish economic stability, enhance social welfare, revive city's historic identity.

© 2021 The Authors. Published by IEREK press. This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>). Peer-review under responsibility of ESSD's International Scientific Committee of Reviewers.

Keywords

Land-use change; Urban Agriculture; Land-use Impact; Informal settlements; Afghanistan; Kabul City

1. Introduction

Land-use is defined as the mode of the utilization of land by humans, like, farming, mining, and felling (Soja & Kanai, 2021). Accordingly, land-use change is the transformation of a land-use type by humans either through another form of land-use (such as the change from an agriculture land into informal settlements) or through changes in management practices inside of a land-use type (for example, the intensification of agriculture in an area). Usually, these changes in land-use occur next to human habitats (Cowell, 1995). Land transformation of agricultural land has become a global phenomenon plaguing, especially, in developing countries that rely in their economy on agriculture. In Afghanistan agriculture is the primary resource in achieving food security and economic development, where it represents 31% of annual national income. Afghanistan was also known for its quality agro products. According to USAID agriculture

was once the historical identity of Afghan cities (USAID, 2019). Kabul city for example has once produced all its food need inside its city and districts. It supplied food for a two million population in 90s (JICA and DCDA, 2009). A considerable amount of land-use change has occurred in the Kabul City in recent years. The reason behind these changes is mainly war conditions which led to population concentration in Kabul and high housing demand. It resulted in rapid population growth, problems in land laws and regulation and economic difficulties of farmers in their land. The Kabul city was designed for a two million population in 1978 (UN-Habitat, 2015). While it reached 4.5 million in 2011 which indicated how fast growing it is (JICA and DCDA, 2009). The acres of cropland, pastureland, and rangeland decreased predominantly, which has created so many unplanned and slum areas. There are plenty of places in Kabul city facing this phenomenon, in this paper Yakatoot area has been considered as a sample for the research study. Because the area is very close to the city center and once was totally an agriculture land. Yakatoot is located five kilo-meters south to Kabul Airport, in the Ninth district of Kabul city. Due to changes in the last two decades residential houses covered a large space of the Yakatoot agriculture area which occupies about 214.6 hectares of the total 332 hectares. In 2009 there was 117.2 hectares of agriculture land in Yakatoot which was further transformed into illegal development since then. There are some government organization as well specially, the lots which are located along the main streets and corners are mostly covered by government institutions and local commercial units. Now due to problems stated above there are only a few involved in agriculture inside the city. According to CRIDA's (Capital Region Development Authority of Afghanistan) survey, about 34 percent of agricultural land has been transformed to informal settlements in a period of 2009-2016, which means only 40 hectares is left for agriculture purposes. These settlements do not have proper infrastructure, so it caused environmental contamination in the area. Which has driven the community and its surrounding area to serious urban challenges. In order to understand how land-use change affect the productivity of a city, we need to explore the socio-economic and environmental impacts of land-use change. In addition, the international case studies have been reviewed in this study to find ways of fighting the land-use change inside the Kabul city and other similar cities. The studies featured how urban agriculture could be a feasible solution to avoid land-use change. This paper aims to investigate the land-use transformation issue and its relation with socio-economic and environmental imperfections created by these transformations. It will also elaborate the causes of the land-use change and the parallel practices affecting the phenomenon and their policy implications. The research will finally go through the urban agriculture practice which is the craft of cultivating crops and other agro products which has been a potential solution for many similar land-uses change cases around the world. In other words, the study indicates that how an emphasize on inducing the urban agriculture in urban laws and regulation could restore the Kabul city's historical identity. It would revive the craft of urban agriculture in Yakatoot in specific and in Kabul city plus other Afghan cities as a whole. Moreover, it will stop informal developments in agriculture land inside the cities which will predominantly reduce the socio-economic and environmental negative impacts of land-use transformation.

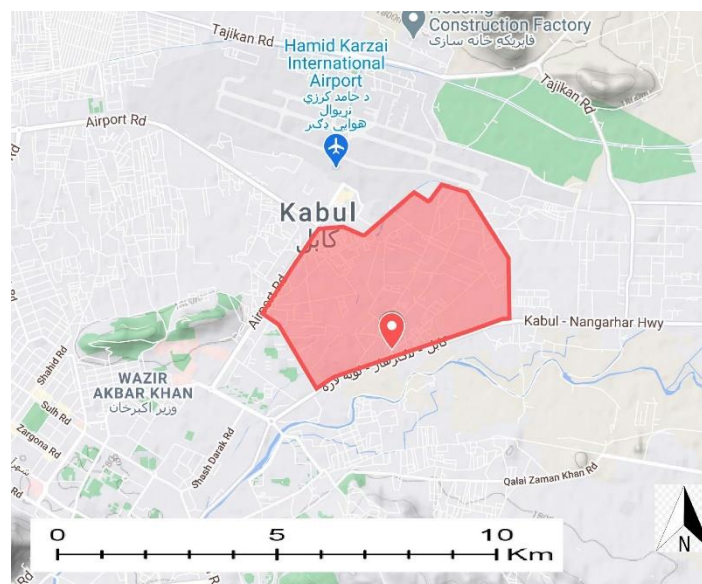


Figure 1. The location of Yakatoot Municipal area in Kabul City

2. Literature Review

2.1. Land Laws

Land laws and regulations are one of the main causes of good land values around the world. In a global context the insecurity of land tenure and poor administration of land rights are the main causes of poverty and inequality (UNITED NATIONS, 2021). Studies have shown that the better the land regulations, the higher its price and productivity will be (Han et al., 2020) (Glaeser et al., 2003). In addition, it is also interpreted from above articles that more efficient land laws led to economic development and high social welfare rates. That's why the international organizations invest in strengthening the land regulations in developing countries to support sustainable development and justice in land access (Dowall & Clarke, 2018). Moreover, there are some viable regulations exist in some developing countries but due to poor enforcement of these laws many developing cities suffer from urban, social, economic and environmental issues.

A joint UN, UN-Habitat and World Bank report reveals that most of the land development policies are inefficient in poor and developing countries (Dowall & Clarke, 2018) (UNAMA, 2015). For instance, in India the rapid urbanization and inefficiency in urban development policies have led to creation of slums and densely populated areas where sustainability fades away. The study suggests government intervention in providing enough land access and housing for poor also provision of public facilities by reforming those land policies which are solely based on business activities and revenues generation for the governments and private sector. It's also believed that the transformation of agriculture land which is in some cases inevitable should be taken first on low quality agro-land (NIEMAND, 2011).

Developing countries like Jordan experience the land-use change due to poor land-use planning laws. Land-use change especially change of agricultural land to residential built area has caused an urban sprawl and serious environment degradation in Jordan, Shihan, which is considered a waste of agro-land and costly servicing the sprawled areas (Al Tarawneh, 2014). Another example could be India with vast green and agriculture land, experiences sever land-use change due to new developments and rapid urbanization process (Dowall & Clarke, 2018).

The land laws in Afghanistan are mainly based on national land policy prepared by national land authority of Afghanistan and decreed by cabinet under the supervision of president (ARAZI, 2017) (ARAZI, 2007). Violating the national land laws is one of the major causes of land-use change in Afghanistan. The problem arises because these national laws are not broke down and interpreted to the local level. Another problem, most of the properties in Afghanistan have never been surveyed. A majority of landowners do not hold legally recognized deeds to their property but rather have customary land deeds with poorly defined property description. These properties are grabbed and sold many times. The lack of clear boundaries is a major factor in land-use change, it often leads to land disputes. Years of war and conflicts also prevented the import of modern survey and mapping technologies by which boundaries could be easily determined. However, there are some efforts in this area by urban sector including Afghan Geodesy and Cartography Head Office (AGHCO) and ARAZI authority of Afghanistan but it remains ineffective because of the land grabbers and incoordination between different urban sector organizations (FHCRAA & USID, 2009).

2.2. Administration of land in Afghanistan:

In most of the developing countries the administration of land is centralized which bring lots of problems from budget issues to lengthy development documents processing that makes them inefficient (Dowall & Clarke, 2018). On the other hand, most of the developed countries try to decentralize the land management and authorize the local authorities for an efficient land administration (Dowall & Clarke, 2018).

The government of Afghanistan consolidates the land to its own support. The Decree 99 was issued in April 2002 to stop the distribution of public-land to undeserving beneficiaries. The distribution of public land is the responsibility of national government which limits the misuses of public and government land in the country. Unfortunately, during conflicts, most of public and state land was under the control of previous war commanders. Formally the Arazi land Authority and Municipalities administrate the land issues in Afghanistan. The local government needs to follow what is stated in national land policy and assigned to them by central government (ARAZI, 2017). A combination of

customary, statutory and religious laws determines the ownership of land. Communities sometimes interpret the laws and ownership of land without consideration of any government document. Land disputes are also judged based on these interpretations and Islamic laws regarding land ownership (UN-Habitat, 2015). Informal housing on the other hand is growing in Kabul city because of poor land administration in Kabul city (FAO-UN, 2013).

2.2.1. Role of Courts in Land Administration

The judgments on disputes and sales of land are usually managed by courts in an international level (UNITED NATIONS, 2021). They facilitate the protection of rights and provision of deeds in many countries. They are also important entities in archiving property deeds and judging the land claims. There are courts at provincial and district level in each province of Afghanistan (UN-Habitat, 2015). The provincial courts which are about 34 in number, usually gather and archive all documents and land dispute cases in one book. The local courts report all those documents to central courts in paper-based activity and progress reports (UN-Habitat, 2015). The problem this lengthy process creates affects the people's desire on grabbing land. In fact, the land laws and its related government bodies indirectly help the land grabbing which supports land-use change.

2.2.2. Land-use change and urban agriculture

A study on land-use changes in Kabul city covering the years 2000 to 2010 reveals that deforestation and a decrease in overall agricultural land has been occurring due to multiple development and demand factors on residential plots (Najmuddin et al., 2018). An empirical study in China indicates that on one hand, a controlled land-use change would have positive impact while on the other hand, uncontrolled change of land-use may have negative socio-economic consequences for people (Wang & Sun, 2016). Studies also imply that there is a far more demand of land-use change in countries like China and Nigeria because of housing needs (Worku, 2020) (A.E, 2017). China is intensively experiencing the land-use change due to high demand for industrial and residential land. Thus, it seems controlled by housing demand and economic development (Jin et al., 2015). Another study from Minnesota describes that land-use changes may benefit the private land owners but in the cost of harming the ecosystem and decreasing net social benefits from it (Polasky et al., 2010). It is also believed that the positive social and cultural impacts of urban agriculture is more important than its economic impact (Robert et al, 2020). Accordingly, the urban agriculture make an outstanding 15 percent of Sydney's food supply with much better social and cultural positive impacts (Robert et al, 2020). In Italy a study examines the environmental impacts of agricultural land-use changes into built areas due to poor management based on economic considerations, it caused urban expansion and kept Italy in a challenge to tackle the environmental problem and contribute in reducing the climate change up to 2030 (Martellozzo et al., 2018).

The land-use change even in most developed communities affect the sustainable development especially when there is a change in agriculture land (NIEMAND, 2011). The changes could also include affecting the social behavior of people and the natural resources in an area (Jiang et al., 2013) (NIEMAND, 2011). The farmland around the world in total is experiencing development interventions and being decreased enormously (Jiang et al., 2013).

Due to urbanization dilemma urban agriculture could support food production as the world would experience food shortages. It would provide more urban jobs especially for poor which will reduce poverty expected of urbanization trends (Rooyen & Langer, 2021). There are evidence that population growth made governments to undermine the food production initiatives for the sake of housing and development demands (A.E, 2017). Despite the fact that urban agriculture reduces hunger and support food supply, it would also contribute in environmental preservation, waste management and sustainable development (Krishnan et al., 2016). A study reveals that due to significant increase in the world's urban population urban agriculture would contribute in food supply and sustainable development of cities with the fact that 25 to 30 percent of urban population is involved in urban agriculture now (Orsini et al., 2013). A study from Delhi in India, which has more socio-economic similarities with the Kabul city was carried out by Josef Martinez and Harpreet Kaur. The research was on agriculture activities (in both sides of Yamuna River in 2017), there are about 7000 farmers in Delhi who cultivate crops and grain inside the city and present it to local markets (Martinez, 2013). The study says: "these farmers live along the banks of the Yamuna River. The Indian government may not accept their doing, but they unwillingly created urban agriculture practice inside the city and farm in urban areas to support their families and take part in supplying the local markets (Martinez, 2013). They farm smaller plots

of land but can get higher profits by growing three or four seasons and selling their products directly into the local markets, avoiding middlemen entirely ". Despite the conflicts between these farmers and their government, this practice (Urban Agriculture) has contributed a lot in economic and environmental protection of the city (Martinez, 2013). In response to rapid urbanization of Kabul city and to avoid the land-use transformations from agriculture to urban areas, a comprehensive study suggests consensus or community-based development and decentralization of land development practice to the local authorities in order to limit further transformations and speed down the urbanization process (Hidayat & Kajita, 2019). It would be responsive if the officials work on supporting the agriculture inside the city and avoid further illegal developments and accordingly to decrease socio-economic and environmental negative impacts.

2.3. land-use Change Imperfections

2.3.1. Socio-economic Impacts

The land is considered as an important factor of production and a vital supporter of the economy through its involvement in food and housing production. So, land is the main pillar of agricultural based economies and it provides considerable socio-economic benefits (FAO-UN, 2013). Whereas, land-use transformation in Kabul caused so many socio-economic negative impacts. For instance, illegal developments in agricultural areas may provide landowners with some benefits but also, it causes soil contamination due to daily use of chemicals by humans and decreases the quality of agriculture products. As a result, the income from these products decreases intensively (FAO-UN, 2013).

As the urbanization process continues, land-use transformation speeds up. In the case of Kabul city, these transformations target agricultural areas. While targeting this land, it also affects the input and output scales of adjacent land as well (Najmuddin et al., 2018). When the farmers find their land like squatter island inside the informally developed areas having difficulties to move their machinery toward it, they change their mind on how to utilize their land in a profitable way (Sell it for homeless people and they construct informal residential units on it).

Agriculture presents important opportunities for farmers (Rooyen & Langer, 2021). If they are not encouraged to find alternative ideas of selling parts of their land for development purposes (NIEMAND, 2011) (CRIDA, 2016). The concept of producing agro-products will gradually change in areas located near to the cities. Farmers are affected by urbanization and produce less but expensive products. Instead, they use part of their land for construction purposes. For example, no farmer in Ykatoot area, farm low-value products like potatoes but they farm fruits and high-value vegetables instead. Hence a huge part of Yakatoot area is being transformed into residential informal areas annually.

Major socio-economic impacts found:

- Conversion of agriculture land to informal settlements reduce the food productivity of cities and increase dependence on imports.
- Land-use change removes agriculture craft from Kabul city.
- Construction process reduces land quality and productivity
- Conversion of agricultural land to irregular developments reduces the public spaces and green landscape of areas
- Land-use change in Kabul city produces a vast number of informal settlements in which, no infrastructure is provided.

2.3.2. Environmental Impacts

Land-use change is probably one of the deadly forces which harms the ecosystem and devours green areas in Afghanistan. This phenomenon transformed the landscape of Kabul city and deprived more than three million people of safe drinking water. Additionally, underground water has been lowered up to 30 meters (World Bank, 2010), the soil contamination and air pollution reached the sever levels, and the whole scene of the city is transformed with 70 percent informally developed areas (mostly in agricultural land) (UN-Habitat, 2015).

Agriculture and greenery provide many unique services. They lay the ground for biodiversity and promotes wildlife habitat, they decrease the carbon dioxide from the atmosphere, and they avoid soil erosion by recharging underground water. These services directly affect the ecosystem. If they are ignored it could lead to a lot of urban challenges. For example, if the illegal land-use changes continue in Kabul city there will be a lot of extra informal settlements added to the existing 70% informal developments. As a result, the soil & water contamination and air pollution will increase predominantly which could make Kabul inhabitable (Worldbank, 2021).

There are currently three urban sector organizations (CRIDA, Kabul municipality, and Ministry of Urban Development) and one international organization (UN-Habitat) working on upgrading and redevelopment of informal settlements in Kabul City, but unfortunately, they only could provide some basic needs to these settlements so far (FHCRAA & USID, 2009).

Major land-use change environmental impacts found:

- Land-use change without any previous planning has negative effects on natural resources including water, air, soil, nutrients, plants, as well as ecosystem and animals.
- Land-use change specifically changing to informal areas without infrastructure causes degradations and contamination of water, soil, and air.
- In Kabul city, where the only drinking water source is underground water, water levels have faced severe descending which cost both people and the environment.

3. The Research Methodology

This research studies the phenomena of agricultural land transformation in Afghanistan by examining the impacts of this transformation on socio-economic and environmental aspects. The methodological framework used in this study has explored the existing land laws and regulations regarding land development and agricultural land in Afghanistan, according to which, all public and private land in Afghanistan should be utilized. This study examines the socio-economic and environmental impacts of land-use change within the area based on qualitative studies. Also, different international and national case studies in the field have been investigated. International case studies regarding the land-use change and urban agriculture are reviewed to understand the depth of the issues and how to avoid further decrease in agricultural land within the city, and to investigate for a sustainable solution. Yaktatoot, is a local case in Kabul to illustrate alive example of what is happening on agricultural land in Kabul city. The Indian model was selected as an international example to take the advantage of scientific studies in the subject of urban agricultural as an experience proven usefulness in tackling and reducing the impacts of land use changes in Kabul. The evaluation of socio-economic and environmental problems created by land-use change in the area also needed primary data. Thus, several socio-economic and environmental analysis surveys have been conducted by CRIDA in Kabul City (Yakatoot area) in 2016 (CRIDA, 2016). A detailed land readjustment report was also prepared by CRIDA in 2016. Moreover, secondary data and GIS satellite images have been prepared to compare the changes between 2009 and 2016 in Yaktatoot. The similarities of the land-use change and its factors in the area with the international land-use change cases have driven this study toward urban agriculture. So, several agricultural cases like the case from Sihan city, World Bank investigated cases and the study from Sarada Krishna were also investigated to promote an effective solution for the problem in the area and other agriculture land within the country. Furthermore, the poor access to updated data and few studies on the topic could be mentioned as limitations in this study.

4. Results and Discussion

4.1. Yakatoot Area

Afghanistan with 34 provinces has one of the historical capitals in the world. Kabul the capital of Afghanistan has a history of 3500 years which was famous for having gardens, palaces and an ancient transit way named Silk Road in the region (L. Planet, 2019). Due to decades of conflict in this country the Kabul city's infrastructure is destroyed and now it is the home of nearly 70 percent informal settlements (UN-Habitat, 2015). The new established government

in Afghanistan prepared some urban rules and regulations to avoid the transformation of agriculture land to informal developments but it seems inefficient.

This study picks the Yakatoot as the study area because the area is very close to the Kabul city's center and once was totally an agriculture land (CRIDA, 2016). The area was supplying the vegetables to its surrounding areas. The important thing about this area is that it was once a productive green agriculture land inside the city. Yakatoot is located Five kilo meters south to Kabul Airport, in the ninth precinct of Kabul city. The residential houses covered a large space of the Yakatoot area which occupies about 214.6 hectares of the whole area which is 332 hectares in total (CRIDA, 2016). The lots which are located along the main streets and corners are mostly covered by government institutions, military base, and private companies. Previously the area was barely used for agriculture and food production purposes but now unfortunately the illegal and informal developments changed its face and created many urban challenges to the area and its surrounding.



Figure 2. Pictures of the area showing the transformation of agriculture land

In year 2009 agricultural land was covering about 117.2 hectares of the whole area (CRIDA, 2016). Figures (3a and b) below illustrate that 34 percent of agricultural land transformed into informal settlements from 2009 to 2016 which is a clear example of how land-use change can be challenging.

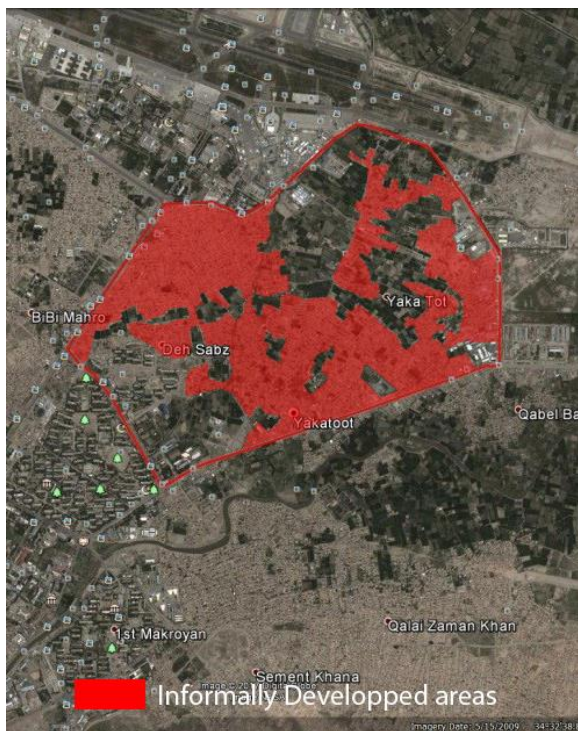


Figure 3.(a) Satellite Image of Yakatoot 2009 (UNFCCC, 2018)

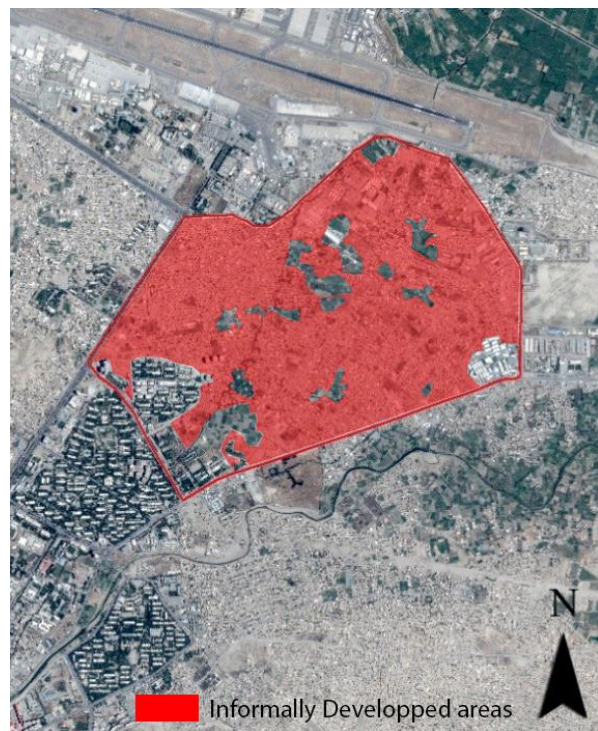


Figure 3.(b) Satellite Image of Yakatoot 2016 (UNFCCC, 2018)

4.2. Urban Agriculture

Urban Agriculture is the practice of cultivating, processing and distributing food in or around a village, town or city. Urban Agriculture can also involve animal husbandry, agriculture, agroforestry, urban beekeeping and horticulture, these activities occur in suburban areas as well. Thus, urban Agriculture plays an important role in making food more affordable and in providing emergency supplies of food. In addition, Urban Agriculture can reflect varying levels of economic and social developments, urban and sub-urban agriculture expands the economic base of the city through production, processing, packaging, and marketing of consumable products. which results in increasing the entrepreneurial activities and creation of jobs as well as reducing food costs and improving quality. The urban agriculture reduces demand pressure of vegetables and fruits on rural areas (Robert et al, 2020). Additionally, it provides employment, income, and access to food for the urban population, which help to relieve chronic and emergency food insecurity. Chronic food insecurity refers to less affordable food and growing urban poverty, while emergency food insecurity relates to breakdowns in the chain of food distribution. There are a number of social benefits that have emerged from urban agriculture, such as increasing overall social and emotional well-being, improved health and nutrition, good income, employment, food security within the households, and community social life (Rooyen & Langer, 2021). Based on a report a person may have decreased levels of stress and better overall mental health when he/she has opportunities to interact with nature through a garden (Wu, 2007). Urban gardens also offer a space of retreat in densely populated urban areas (CRIDA, 2016) (NIEMAND, 2011). There are many documented cases by JunJie Wu in which community gardens lead to improved social relationships, increased community pride, and overall community improvement and mobilization (Wu, 2007). It can also be connected to decreased levels of crime and suicide rates (Wu, 2007). The urban agriculture should be considered above the land development initiatives because of its importance for future food scarcities and sustainable development (A.E, 2017). While urban agriculture supports walkability aspects, it can also be supportive to change the travel behavior of residents and avoid their reliance on car transport system (Wu, 2007)(CRIDA, 2016). In Afghanistan agriculture sector accounts for up to 40 percent of Afghanistan's gross domestic products. Agriculture is considered critical to Afghanistan's food security and a driver of economic growth. The majority of Afghans rely on agriculture of their family's sustenance. Prior to decades of conflicts, Afghanistan's agricultural products earned a global reputation for excellence. Kabul University produced a report in 1988 which found that agricultural output was 45 percent less than the 1978 level which was approximately 50% of GDP and it continued to get worse now (FHCRAA & USID, 2009)(CRIDA, 2016). Based on the socio-economic and environmental vulnerability of Yakatoot and other similar areas in Kabul city, we found urban agriculture as the best and most effective solution to avoid land-use changes.

Thus, based on socio-economic and environmental benefits of urban agriculture and the similar case of Delhi city and the number of 7000 employment opportunities which it made as well as supplying food to the city, this paper found urban agriculture as an effective defense against informal land-use change in Kabul city and a protective shield against negative socio-economic & environmental impacts caused by land-use change in Kabul. The study also generate the Figure 4 which elaborates the patterns and solutions to prevent the affect of land-use transformation based on findings of this study; furthermore, it shows the direct and indirect impacts of urban agriculture as the solution to the socio-economic and environmental imperfections of land-use change. The diagram further illustrates that from economic point of view the urban agriculture could be more efficient if we increase the impact value of produced products by inflicting supportive policies. As well as in social part we need new development initiatives to avoid urban segregation and provide more housing in a densification process.

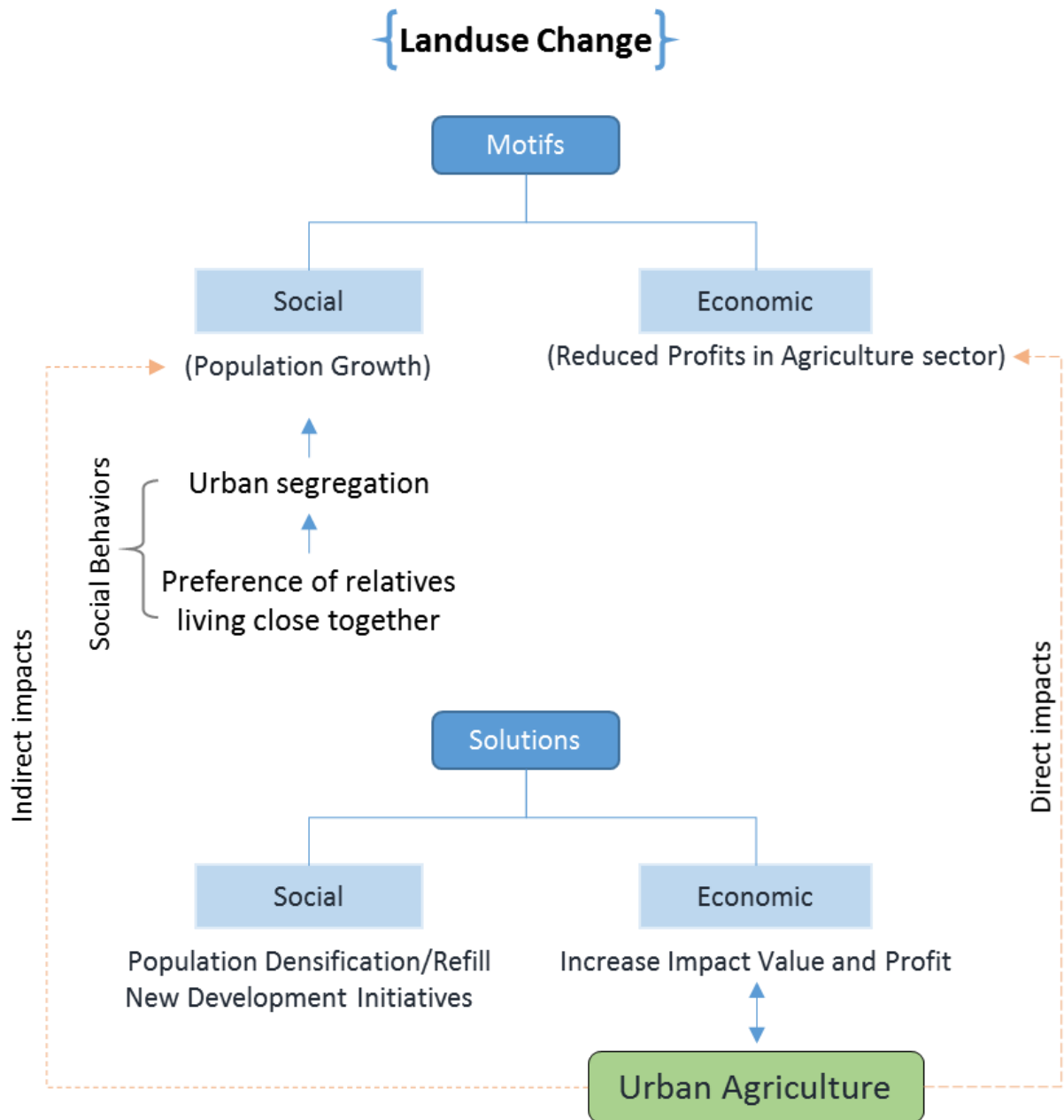


Figure 4. Urban Agriculture as a feasible solution

5. Conclusion

Land-use change as it was defined in this study could be more challenging and negatively impactful if not controlled, especially, if we put it in Afghanistan context. The state of its impacts depends on how well it is guided towards a controlled and manageable process that will lead to socio-economic and environmental sustainability, otherwise, it will turn out to be an unpleasant process that will affect the overall sustainability of an area. As it can be seen in the case of Kabul city, land-use change is leading to the creation of informal settlements. The agricultural and green land decreased predominantly, which has created so many unplanned and slum areas. Generally, a poor land management, problems in laws, inconsideration of housing needs, and inexistence of support for urban agro products could be the main motives for land-use changes in Kabul city. It has caused serious challenges to various urban sectors. Dense informal settlements, lower living quality in more than 70% of Kabul's residential areas, dissatisfying economic stability, and insufficiency in public services are some of the negative impacts of land-use transformation in the city. For instance, Yakatoot area is one of the many agricultural areas of the capital city that has faced land-use transformation. Going deeper to the causes of land-use change in Yakatoot area, this paper found that there are three main causes that led to the transformation of agricultural land: rapid population growth, demand for housing, poor infrastructure and planning laws plus lack of enforcement of these laws. The residents sold parts of their land to the

homeless and received money instead of cultivating the land. Subsequently the trend continued until the area was full of informal settlements facing sever socio-economic and environmental problems. The Yakatoot area and many more similar areas are experiencing the above-mentioned transformation and caused negative impacts to the environment as well as socio-economic conditions of the city. For instance, the areas are changing to consumer places in terms of food and agro-products. These land use transformations affect the overall productivity of adjacent land and removes the agriculture craft from the city. It also created so many informal developments without any infrastructure and facilities which will surely decrease the quality of life by affecting the soil, water and air qualities. To come up with a sustainable solution for the current situation, this paper recommends promotion of urban agriculture as a feasible option to avoid further land-use changes. The study went through the implications of urban agriculture in an international context and evaluated the land-use change imperfections. The lessons drawn from the study suggests a viable support of agriculture inside the cities and locating markets near to agricultural villages, which is known as urban agriculture. The Study also revealed that urban agriculture has led to the sustainable environment by increasing economic activities, creating eco-friendly neighborhoods, lowered waste production, production of food inside the city, and reasonable product prices. We need an urban agriculture strategy to establish eco-friendly neighborhoods, and stop the ongoing land-use change trend in the Yakatoot area and the Kabul city. Meanwhile, the urban agriculture itself is widely used as a preventive strategy to avoid land-use change. Worth of mentioning that, besides the socio-economic and ecologic impacts of urban agriculture, the urban aesthetics of city will also be enhanced and will revive its lost appearance. So, we need to promote urban agriculture through development initiatives to achieve food security, socio-economic development, and environmental protection.

References

- Dowall, D. E., & Clarke, G. (2018). *A framework for reforming urban land policies in developing countries*. Washington, DC. USA.
- A.E, T. (2017). The Impact of Urban Expansion on Agricultural Land and Crop Output in Ankpa, Kogi State, Nigeria. *Landscape Architecture*, 1(1), 1. <https://doi.org/10.31058/j.la.2017.11001>
- Al Tarawneh, W. M. (2014). Urban Sprawl on Agricultural Land (Literature Survey of Causes, Effects, Relationship with Land-use Planning and Environment) A Case Study from Jordan (Shihan Municipality Areas). *Journal of Environmental and Earth Science*.
- ARAZI, A. L. A. (2007). (rep.). *Afghanistan national land policy*. Kabul.
- ARAZI, A. L. A. (2017). (rep.). *National Land Policy. 2016. Approved by Cabinet of Islamic Republic of Afghanistan*. Kabul.
- Cowell, S. J. (1995). Changes in Land Use and Land Cover: A Global Perspective. *Global Environmental Change*, 5(2), 161–162. [https://doi.org/10.1016/0959-3780\(95\)90051-9](https://doi.org/10.1016/0959-3780(95)90051-9)
- CRIDA, C. R. I. D. A. (2016). (rep.). *Land readjustment report of Yakatoot area*. Kabul. Kabul.
- FAO-UN. (2013). Home. Food and Agriculture Organization of the United Nations. <http://www.fao.org/home/en/>.
- FHCRAA & USID. (2009). (rep.). *Agriculture in Afghanistan*. Kabul.
- Glaeser, E., Gyourko, J., & Saks, R. (2003). *Why is Manhattan So Expensive? Regulation and the Rise in House Prices*. <https://doi.org/10.3386/w10124>
- Han, W., Zhang, X., & Zheng, X. (2020). Land use regulation and urban land value: Evidence from China. *Land Use Policy*, 92, 104432. <https://doi.org/10.1016/j.landusepol.2019.104432>
- Hidayat, O., & Kajita, Y. (2019). Land Use Management and Urban Land Expansion in Kabul: A Case Study of Rapid Urbanization. *Current Urban Studies*, 07(02), 193–205. <https://doi.org/10.4236/cus.2019.72009>
- Jiang, L., Deng, X., & Seto, K. C. (2013). The impact of urban expansion on agricultural land use intensity in China. *Land Use Policy*, 35, 33–39. <https://doi.org/10.1016/j.landusepol.2013.04.011>
- JICA and DCDA, M. of U. D. J. I. C. A. , D. C. D. A. (2009). (rep.). *Kabul Metropolitan Area Urban Development Master plan*.
- Jun, G., Li, Z., Wang, Z., Chu, X., & Li, Z. (2015). Impact of land-use induced changes on agricultural productivity in the Huang-Huai-Hai River Basin. *Physics and Chemistry of the Earth, Parts A/B/C*, 79-82, 86–92. <https://doi.org/10.1016/j.pce.2015.01.005>
- Krishnan, S., Nandwani, D., Smith, G., & Kankarta, V. (2016). Sustainable Urban Agriculture: A Growing Solution to Urban Food Deserts. *Sustainable Development and Biodiversity*, 325–340. https://doi.org/10.1007/978-3-319-26803-3_15
- L. Planet. (2019, September 7). Kabul travel. Lonely Planet. <https://www.lonelyplanet.com/afghanistan/kabul>.
- Martellozzo, F., Amato, F., Murgante, B., & Clarke, K. C. (2018). Modelling the impact of urban growth on agriculture and natural land in Italy to 2030. *Applied Geography*, 91, 156–167. <https://doi.org/10.1016/j.apgeog.2017.12.004>
- Martinez, J. R. (2013). (rep.). *Urban Agriculture in Delhi: (pp. 8–12)*. Delhi.
- Najmuddin, O., Deng, X., & Bhattacharya, R. (2018). The Dynamics of Land Use/Cover and the Statistical Assessment of Cropland Change Drivers in the Kabul River Basin, *Afghanistan*. *Sustainability*, 10(2), 423. <https://doi.org/10.3390/su10020423>

- NIEMAND, B. E. R. N. A. R. D. (n.d.). TRANSFORMATION OF AGRICULTURAL AND UNDEVELOPED LAND IN THE ...
https://scholar.sun.ac.za/bitstream/handle/10019.1/6776/niemand_transformation_2011.pdf;sequence=1.
- Orsini, F., Kahane, R., Nono-Womdim, R., & Gianquinto, G. (2013). Urban agriculture in the developing world: a review. *Agronomy for Sustainable Development*, 33(4), 695–720. <https://doi.org/10.1007/s13593-013-0143-z>
- Polasky, S., Nelson, E., Pennington, D., & Johnson, K. A. (2010). The Impact of Land-Use Change on Ecosystem Services, Biodiversity and Returns to Landowners: A Case Study in the State of Minnesota. *Environmental and Resource Economics*, 48(2), 219–242. <https://doi.org/10.1007/s10640-010-9407-0>
- Rooyen, C. van, & Langer, L. (n.d.). What are the impacts of urban agriculture programs on food security in low and middle-income countries: a systematic review. Academia.edu. https://www.academia.edu/9994077/What_are_the_impacts_of_urban_agriculture_programs_on_food_security_in_low_and_middle_income_countries_a_systematic_review.
- Soja, E. W., & Kanai, J. M. (2021). 10 The Urbanization of the World. Implosions /Explosions, 138–159. <https://doi.org/10.1515/9783868598933-011>
- UN-Habitat, & Unhabitat. (n.d.). UN-Habitat Global Country Activities Report 2015 - Increasing Synergy for Greater National Ownership. Issuu. https://issuu.com/unhabitat/docs/habitat_global_activities_2015.
- UNAMA. (2015, December 14). UNAMA releases report on Afghan land distribution. UNAMA. <https://unama.unmissions.org/unama-releases-report-afghan-land-distribution>.
- UNFCCC. (2018). Land-use, land-use change, and forestry: Glossary of climate change acronyms. https://unfccc.int/sites/default/files/resource/Database_Mapping_Activity%209_updated%20on%20130920.xls.
- UNITED NATIONS. (2021). Sustainable Development Goals .. Sustainable Development Knowledge Platform. United Nations. <https://sustainabledevelopment.un.org/?menu=1300>.
- USAID. (2019, July 15). Agriculture: Afghanistan. U.S. Agency for International Development. <https://www.usaid.gov/afghanistan/agriculture>.
- Wang, M., & Sun, X. (2016). Potential impact of land use change on ecosystem services in China. *Environmental Monitoring and Assessment*, 188(4). <https://doi.org/10.1007/s10661-016-5245-z>
- Worku, G. (2020). The Impacts of Urban Expansion on Livelihoods of the Surrounding Rural Society: The Case of Tefki Town, Oromia Special Zone Surrounding Finfinne. *Asian Journal of Humanities and Social Studies*, 8(6). <https://doi.org/10.24203/ajhss.v8i6.6251>
- Worldbank. (n.d.). Environmental and Social Management Framework for ...
<http://documents1.worldbank.org/curated/en/715811468180886241/pdf/E25860EA0P12031Framework1appraisal.pdf>.
- Wu, J. J. (n.d.). Land Use Changes: Economic, Social, and Environmental Impacts. https://www.choicesmagazine.org/UserFiles/file/article_49.pdf.
- Mcdougall, R., Rader, R., & Kristiansen, P. (2020). Urban agriculture could provide 15% of food supply to Sydney, Australia, under expanded land use scenarios. *Land Use Policy*, 94, 104554.