

Knowledge, Attitude and Practice towards the Adoption of Urban Farming: A Concept Paper

Ahmad Shukry Yahya², Nur Bahiah Mohamed Haris^{1,2}, Jasmin Arif Shah^{1,2} and Nurulnadiatulamira Ahmad Zaki²

¹Institute for Social Science Studies, Universiti Putra Malaysia, Serdang, 43400, Selangor, Malaysia, ²Department of Agriculture Technology, Faculty of Agriculture, Universiti Putra Malaysia, Serdang, 43400, Selangor, Malaysia

Corresponding Author's Email: nurbahiah@upm.edu.my

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v13-i17/19838> DOI:10.6007/IJARBSS/v13-i17/19838

Published Date: 06 December 2023

Abstract

Urban farming is a way to ensure food security for human consumption, particularly for urban people who have limited space for agricultural activity. Despite the challenges, urban farming practices have the potential to play a critical role in sustainable food systems and food security. Urban farming has a different purpose of cultivating, such as for sustainability, entrepreneurship, a better life, greater community and as a medium for learning and exploring. This includes numerous benefits including increased access to fresh produce, reduced food transportation costs, and improved community health and well-being. Additionally, it can help mitigate climate change's effects by reducing greenhouse gas emissions, promoting biodiversity, and improvising conventional planting methods. Recently, urban farming has gained more popularity and the adoption among communities keeps increasing for different reasons. Concerning this, the study aims to explore the factors specifically knowledge, attitude, and practice (KAP) that influence the adoption of urban farming practices. There are a few methods in relation to KAP that the researcher focuses on; some studies explain each factor individually, while others as the overall KAP Model as a holistic model. Therefore, this research can further understand the KAP model (as a whole concept) towards the adoption of urban farming practices. This eventually expands more studies on many aspects of urban farming practices and also contribute to the recommendations and improvements in term of the execution of urban farming among the community and urban dwellers.

Keywords: Urban Farming, KAP Model, Adoption, Community

Introduction

According to the Nations Food and Agriculture Organization (FAO), urban farming involves the growing of plants and the raising of animals within and around cities. It includes community gardens, rooftop gardens, vertical farms, aquaponics and many more. In Malaysia,

urban farming refers to practices of growing crops and raising animals within urban areas (Ministry of Agriculture and Agro-based Industry, 2018). This shows urban farming has a similar solution in terms of using an urban area that is limited to growing crops and solving a problem for human consumption.

Urban farming has been recognized as a potential solution to improve food security in various urban areas across the world, as it can provide solutions to urban populations. Here are some examples of how urban farming can contribute to improving food security. First, access to fresh produce in urban farming can increase the availability of fresh produce in urban areas, particularly in places where it is difficult to obtain (Mougeot, 2000). Next, reduced transportation costs that urban regarding to the movement of food from rural to urban areas, as food can be grown and consumed locally (Mok and Williamson, 2015). Furthermore, increased food self-sufficiency such as urban farming can contribute to increased food self-sufficiency, as it can provide a source of fresh produce for households and communities, reducing reliance on external food sources (Smit et al., 1996). Lastly, community engagement which Urban farming can bring communities together and increase their involvement, leading to teamwork and responsibility for food security (Guitart et al., 2012).

In Malaysia, urban farming is not something new and it is similar to activities that have been adopted by urban folks surrounding their community area a long time ago (Abu & Awang, 2017). Urban farming is one of the ways urban people such as Kuala Lumpur and Selangor utilize their limited space for agricultural activities whether for personal consumption or to make use of time as a hobby.

Urban farming activities also have been recognised by the Department of Agriculture (DOA) Malaysia and they also have Community Agricultural Development also known as an urban agriculture program focusing on helping households reduce their living costs through food production (Official Department of Agriculture, 2015). This program is also expected to produce 8,800 metric tons in terms of safe agricultural products to be consumed in 2025.

Hence, the adoption of urban farming practices in Malaysia might contribute to sustainable food production, improve food security, and promote a healthier lifestyle within urban communities. However, successful adoption of urban farming requires careful planning, appropriate policy intervention, and investment in research and development in the future.

Literature Review

Adoption Theory

Adoption might refer to the process of 5 stages which include knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003). In order for adoption to occur, individuals or organizations must go through each of these stages, moving from initial awareness of the new innovation to making a decision, to adopt, to actually using and integrating it into their lives or operations. In the context of urban farming, the process of adoption plays a crucial role in the successful implementation and uptake of modern urban farming technologies and practices. An example by Venkatesh and Bala (2008) shows that if a new urban farming technology offers significant benefits in terms of increased productivity or improved food quality while being relatively simple to implement, it is more likely to be adopted by the community.

Adoption Theory, also known as the Diffusion of Innovations theory, was first introduced by Everett Rogers in 1962. It seeks to explain how, why, and at what rate individuals or groups adopt new ideas, technologies, or practices. The theory is widely applicable across various fields, including agriculture. The key elements of Adoption Theory include:

i. Innovation

An innovation refers to a new idea, practice, or technology that is introduced to a particular system or context. In the context of agriculture, innovations can range from advanced farming techniques and equipment to digital tools and precision agriculture technologies.

ii. Adopter Categories

Rogers classified individuals into different adopter categories based on their willingness to adopt new innovations. The categories include innovators, early adopters, early majority, late majority, and laggards. Understanding these categories helps identify the target audience for promoting and facilitating the adoption of agricultural innovations among youth entrepreneurs.

iii. Adoption Process

The adoption process consists of several stages through which an individual passes before fully adopting an innovation. These stages include awareness, interest, evaluation, trial, and adoption. Each stage represents a different level of commitment and acceptance of the innovation.

Several factors influence the adoption of new technologies and practices in the agricultural sector. For instance, individual characteristics, such as age, education, experience, risk perception, attitudes, and personal motivations, play a crucial role in the adoption process. For the agricultural community, factors like their mindset, willingness to take risks, and their perception of the benefits and costs associated with adopting digital and the latest technologies are particularly relevant.

Social networks, peer influence, and interpersonal communication significantly impact adoption decisions. The attitudes and behaviors of influential individuals within a social group can accelerate or hinder the adoption of urban practices. Peer learning, mentorship programs, and community engagement can facilitate the diffusion of new technologies among the community, particularly entrepreneurs.

Economic considerations, including the cost of adoption, potential returns on investment, access to financial resources, and market conditions, heavily influence adoption decisions. Community need to evaluate the economic viability and profitability of integrating digital technologies into their agricultural enterprises.

Apart from that, the characteristics of the innovation itself, such as compatibility with existing systems, ease of use, scalability, and reliability, affect its adoption. Digital technologies that are user-friendly, adaptable to local contexts, and provide clear advantages over traditional methods are more likely to be adopted by the community.

KAP Model

The knowledge, attitude, and practices model (KAP Model) is known as the basic framework to understand behavior and communication that started in the medical sector in the beginning (Nasir & Ahmed, 2019). The KAP Model is to assesses the effectiveness of a certain program by measuring their knowledge, attitudes, and practices over time. The KAP model identifies that behavior changes are influenced not only by individual knowledge, attitudes,

and practices but also by the social and economic by other individuals as well. Figure 2.1 shows the knowledge attitude practices model which is related to each one of the factors to make the meaningful outcome.

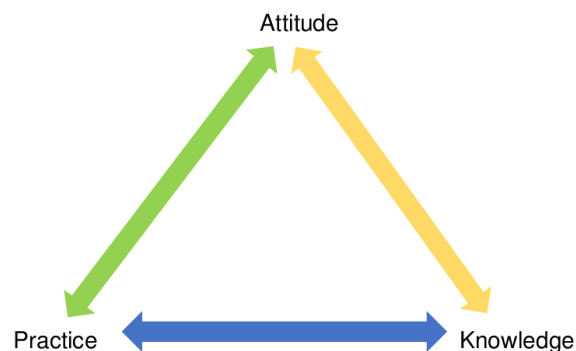


Figure 2.1 The Knowledge Attitude Practice Model
(Source: Bano et al., 2013)

Primarily, understanding between KAP theory and the KAP model is crucial to ensuring the written information is tallied and does not affect the overall explanation. According to Green and Kreuter (2005), the KAP theory is a framework that explains how knowledge, attitudes, and practices can influence behavior changes. The KAP theory is often used in health promotion and education while in terms of the KAP Model, it is a more comprehensive approach that considers socioeconomic status and communication channels, which develop from the KAP theory (Tong et al., 2013).

The KAP model was first introduced in the 1960s as a tool to understand the factors that influence people's behavior related to the adoption of new agricultural technologies that already been done by Tarekegne et al (2017) used the KAP model to investigate knowledge, attitudes, and practices of soil conservation technique in Ethiopia. The study shows that even with the knowledge, attitude, and practices that they have been going through, it is also influenced by various socioeconomic and cultural factors. This is the biggest difference between the KAP theory and with KAP Model that determined the research framework.

Furthermore, The KAP model was used in a different agriculture study by Riediger et al (2015) to comprehend farmers' knowledge, attitudes, and practices around the usage of pesticides in Argentina. The study indicated that although farmers had a strong understanding of the risks associated with pesticide usage, it is also influenced by economic and cultural factors and not forget about the availability of alternative pest control choices at the moment. Knowledge, Attitude, and practice are used to understand human behavior regarding certain topics which are; (1) What the respondents know about it (as knowledge), (2) How the respondents feel about it (Attitude) and (3) What the respondents do about it (Practice) (IDAF, 1994)

Knowledge

Knowledge can be defined as a combination of data, information, experience, and expertise, which provides a framework for evaluating and incorporating new information and experiences (Nonaka, 1991). According to Azman et al (2013), knowledge can be defined as organized or processed information or data and is essential in any innovation process.

Farmers use knowledge to make decisions that influence agricultural management practices. Knowledge is often created through a combination of education and experience (Mangan & Mangan, 1998; Brosius et al., 1986; Grossman, 2003). The understanding farmers' knowledge is important for understanding changes in the landscape at a local level, particularly in terms of land use and cultural practices (Calvo-Iglesias et al., 2006). The fact or state of being relatable with something acquired through experience or association with it defines knowledge (Mohajan, 2016). In the context of urban farming, knowledge refers to the understanding of the best practices, techniques, and technologies needed to grow food in an urban setting.

According to Anderson (1983), knowledge have different type and how they are organized in the human mind such as declarative, procedural, and semantic knowledge. Based on individual knowledge, people can decide such as the selection of crops or the type of urban farming that they want to use and implement in their urban area for urban farming practices. In urban farming, there are various types of knowledge that are necessary to ensure successful production, such as knowledge related to plant growth and development, soil management, water management, pest and disease management, and marketing (Grewal et al., 2019). Farmers must also possess knowledge related to business management, such as financial management, marketing, and customer service, to ensure the viability of their urban farm. Based on Zainal & Hamzah (2018) stated that knowledge plays a significant role in ensuring the objective of urban agriculture succeeds and suggested further research on how to transfer knowledge among the community effectively.

Attitude

Attitude can be defined as a psychological tendency that reflects an individual's evaluation and feelings toward a particular object, person, or situation (Ajzen, 2001). It is also playing an important role in shaping the behaviour and practices of urban farmers. According to Bloom (1956), attitude is explained as the way a person views something or tends to behave towards it, often in an evaluative way. Attitudes can be powerful predictors of behavior and idea acceptance (Ajzen, 1991; Dietz et al., 2005; Arbuckle et al., 2013). Farmers' reactions to changes in agricultural policy are influenced in part by the attitudes and mindset of the latter group, according to decision-makers (Gorton et al., 2008).

Understanding farmers' perceptions and attitudes can put a spotlight on why they adopt new technology beyond its economic benefits, as well as which industry researchers should focus on to encourage the adoption of these technologies (Adrian et al., 2005). Yang et al (2005) added that the evaluation of farmers' knowledge, perception and practices regarding a new technology is essential for the development of strategies to sustain the new technology. Elsewhere, Dawoe et al (2012) have argued that farmers' knowledge and perceptions of soils, as well as local indicators of soil quality, are important for the development of technologies and management interventions.

A positive attitude towards urban farming can lead to increased motivation and commitment to the activity, while a negative attitude can discourage farmers from pursuing it. Positive attitudes towards urban agriculture are associated with increased participation and adoption of urban farming practices (Ratner et al., 2017). Conversely, negative attitudes may decrease the adoption of urban farming practices, even if they are effective in improving food security and sustainability.

Based on Hossain et al (2021) study, a positive attitude is the key to shaping the behaviour and practices of urban farmers and developing positive attitudes towards urban farming and increasing its impact. The study concluded that developing positive attitudes towards urban farming practices could help to promote the activity and increase its impact on food security and environmental sustainability.

Practice

Practice can be defined as a habitual or customary action or activity, typically performed in a particular area or context (Lave & Wenger, 1991). According to Rouse (2007), practice ranges from temporary actions to long-term activity patterns. Practice can be assigned fundamental roles by looking at equipment and material culture, but they can also be assigned to essential roles by looking at terminology and other linguistic forms or achievements. A few examples from the practice theory literature demonstrate the size scope and scope of activities considered practices by various theorists. Practice is the actual application or use of an idea, belief, or method, as opposed to theories about it. It is a standard or expected procedure or method of performing a task.

Agricultural practices are a set of principles to apply to farm production processes in order to produce better agricultural products and agriculture practices are simply agricultural practices that make farming convenient. In the context of urban farming, practice refers to the practical activities and actions involved in growing food in an urban area. Urban farming practices involve a range of activities, such as site selection, soil preparation, planting, irrigation, pest, and disease management, harvesting, and marketing (Grewal et al., 2019). Urban farmers may employ a variety of production methods, including container gardening, hydroponics, aquaponics, and rooftop gardening.

Research has shown that the success of urban farming practices is influenced by a range of factors, including access to resources, knowledge, and community support (Hassanein, 2003). Additionally, the use of sustainable practices that minimize environmental impact is important to ensure the long-term viability of urban farming and ensure food security. This is related to the KAP model where practice also can be influenced by many outside factors as well.

Therefore, practices of urban farming in Malaysia have the potential to contribute to food security, environmental sustainability, and social well-being. However, to realize its full potential, urban farmers must adopt best practices that ensure the efficient use of resources, minimize environmental impact, and ensure the production of high-quality crops.

Research Framework

A research framework is a theoretical model that offers a framework for organizing concepts, hypotheses, and research questions. It is a collection of connected ideas, presumptions, and hypotheses that direct the research process. A research framework frequently comprises a survey of relevant literature, the identification of important ideas and variables, and an explanation of how these factors are related to one another. In addition to identifying relevant data sources and developing hypotheses or research questions that may be evaluated through data analysis, the framework aids in defining the scope and emphasis of the research project. Overall, a research framework provides a conceptual and theoretical foundation for the research study and helps to ensure that the research is rigorous, relevant, and meaningful.

This framework is related to each factor and at the end of this research might highlighted the significant contribution of factors that contribute the adoption of urban farming practices among agriculture communities.

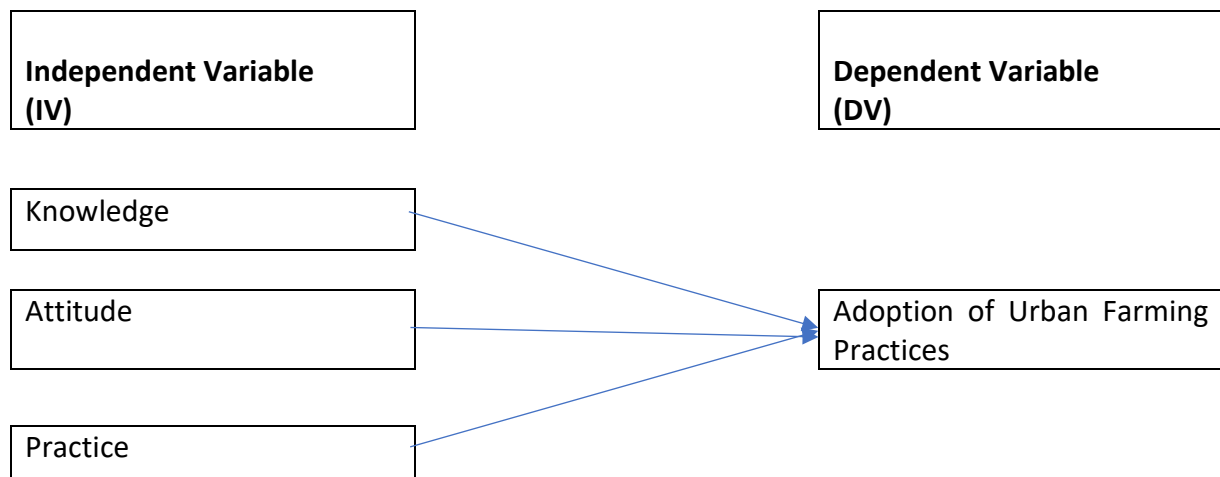


Figure 1. The Research Framework shows the KAP Factors towards the Adoption of Urban Farming

Limitation and Future Studies

Urban farming faces several limitations that must be addressed to facilitate the widespread adoption for long-term sustainability. Among these is the challenge of space constraints, which is related to urban areas. Limited availability of land and suitable areas for gardening or farming can severely affect the scale and productivity of urban farming initiatives. Another major constraint is the quality of urban soil, that often tainted by pollutants and heavy metals, making it unsuitable for food production. Overcoming this hurdle necessitates the development of cost-effective and eco-friendly soil remediation methods.

Hence, future studies in the adoption of urban farming should delve into various aspects to overcome the existing limitations and maximize the potential of this sustainable practice. Firstly, researchers can focus on developing and promoting climate-resilient farming practices, considering the increasing challenges posed by changing weather patterns and extreme climate events in urban environments. Investigating innovative technologies, such as vertical farming, aquaponics, and hydroponics, can significantly enhance productivity and sustainability in urban farming. Furthermore, studies should explore cost-effective soil remediation techniques to address soil contamination issues, making urban farming more feasible in areas with soil quality challenges.

Conclusion

To ensure our food security to sustained and improved, our urban farming activities must be inculcated, and awareness must be increased. With the rising awareness about urban farming, our society can plant their food at their own pace regardless of the space of their home. It is back again to the Knowledge, attitude, and practice toward urban farming itself. Through this research, the Knowledge, Attitude, and Practices (KAP Model) become the framework for creating decisions to adopt or not urban farming practices. The promotion of urban farming is a vital step towards enhancing food security and sustainability in urban areas and among communities as a whole. By increasing awareness and fostering a positive attitude towards urban farming, individuals and communities are empowered to take control of their

food production, regardless of the space limitations in their homes. The KAP Model serves as an invaluable framework for understanding the factors that influence urban residents' decisions to engage in urban farming. To further strengthen the adoption of urban farming practices, it is essential to take a multifaceted approach and some recommendations as discussed.

Firstly, education and information transfer are the key components of this endeavor. Creating accessible and engaging resources on urban farming, such as online guides, community workshops, and educational campaigns, can significantly enhance knowledge levels. Schools and educational institutions can incorporate urban farming into their curriculum, ensuring that the younger generation grows up with the skills and awareness for sustainable food production. Furthermore, leveraging social media and digital platforms to share success stories, tips, and best practices can inspire and educate a broader audience towards urban farming practices and approaches.

Secondly, supporting and incentivizing urban farming initiatives is crucial in order to expedite the process of urban farming practices adoption among urban dwellers. Local governments can play an important role by offering funding or tax incentives for urban farming projects, allocating community garden spaces, and implementing policies that promote sustainable agriculture practices. Collaborating with local gardening clubs and agricultural organizations can further boost these efforts. Additionally, encouraging community involvement and cooperation among urban farmers can create a network of support and shared resources, making it easier for individuals to adopt urban farming practices and sustain them for the long term for the future development of agriculture in Malaysia.

Acknowledgement

All authors equally contributed to the conceptual as well as the design of the study.

References

- Abu, N. A., & Awang, M. (2017). The potential of urban agriculture in Selangor, Malaysia. *Pertanika Journal of Social Sciences & Humanities*, 25(4), 1757-1768.
- Africa. IDAF Technical Report N° 60. Retrieved on 29th June 2014
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual review of psychology*, 52(1), 27-58.
- Anderson, J. R. (1983). *The architecture of cognition*. Harvard University Press.
- Andrade, C. (2020). *Designing and Conducting Knowledge, Attitude, and Practice Surveys in Psychiatry: Practical Guidance* - Chittaranjan Andrade, Vikas Menon, Shahul Ameen, Samir Kumar Praharaj, 2020. *Indian Journal of Psychological Medicine*.
- FAO. (2018). *Urban Agriculture*. Retrieved from <http://www.fao.org/urban-agriculture/en/>
- Green, L. W., & Kreuter, M. W. (2005). *Health promotion planning: An educational and ecological approach*. McGraw-Hill Medical.
- Grewal, S. S., Grewal, P. S., & Elumalai, R. (2019). Urban Agriculture: A Review of Growing Prospects and Future Challenges. *Sustainability*, 11(19), 5259.
- Guitart, D., Pickering, C., & Byrne, J. (2012). Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening*, 11(4), 364-373.
- Hassanein, N. (2003). Practicing food democracy: A pragmatic politics of transformation. *Journal of Rural Studies*, 19(1), 77-86.
- Hossain, M. M., Alam, M. S., & Islam, M. R. (2021). Attitudes towards urban agriculture among farmers in Bangladesh. *Sustainability*, 13(6), 3161.

- IDAF, (1994). Program for integrated development of artisanal fisheries in West
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.
- Mok, H. F., & Williamson, V. G. (2015). The potential of rooftop agriculture to improve urban food security. *HortScience*, 50(6), 784-788.
- Mougeot, L. J. (2000). Urban agriculture: Definition, presence, potentials, and risks. *Growing cities, growing food: Urban agriculture on the policy agenda*, 1-42.
- Nasir, M. T., & Ahmed, S. (2019). Knowledge, Attitude, and Practices (KAP) Model for Evaluating Environmental Education Programs. *Frontiers in Psychology*, 10, 2743
- Nonaka, I. (1991). The knowledge-creating company. *Harvard business review*, 69(6), 96-104.
- Panagiotopoulos, P., Giotitsas, C., & Katsoulas, N. (2019). Assessing the factors influencing the success of urban agriculture projects in Greece. *Sustainability*, 11(17), 4747.
- Portal Rasmi Jabatan Pertanian. (2015). Doa.gov.my.
<http://www.doa.gov.my/index.php/pages/view/332>
- Ratner, B. D., Puduri, R., & Phillips, A. (2017). Urban agriculture adoption: A quantitative study of attitudes and practices in the midwestern United States. *Renewable Agriculture and Food Systems*, 32(3), 187-196.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Riediger, L., Galvan, J. P., & Riggio, J. (2015). Farmers' knowledge, attitudes, and practices towards pesticide use: A case study in Argentina. *Journal of Environmental Science and Health, Part B*, 50(6), 471-480.
- Tarekegne, A., Tilahun, E., & Amare, K. (2017). Farmers' knowledge, attitudes, and practices of soil conservation in the Highlands of Ethiopia. *Agricultural Science*, 8(3), 113-120.
- Tong, A., Sainsbury, P., & Craig, J. (2013). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International journal for quality in health care*, 19(6), 349-357.
ao.org/docrep/fao/006/AD342E/AD342E00.pdf.
- Zainal, M., & Hamzah, S. R. (2018). Urban Agriculture: The Role of Knowledge among Farmer in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 7(14). <https://doi.org/10.6007/ijarbss/v7-i14/3653>