EFFECTIVENESS OF URBAN AGRICULTURE PROGRAMME ON COMMUNITY FOOD SECURITY AND NUTRITION IN PENINSULAR MALAYSIA

By

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This research evaluates the effectiveness of the Urban Agriculture Program (UAP) administered by the Department of Agriculture (DOA) in bolstering community food security and nutrition across Peninsular Malaysia. The UAP was initiated as a strategic response to the challenges posed by increasing urbanization, which has had significant implications for food security. Its core objectives include promoting self-sufficiency, reducing household food expenses, and fostering social cohesion. This study employs the CIPP (Context, Input, Process, Product) evaluation model to investigate the program's goals, resource allocation, implementation methods, and the resultant outcomes for its participants. Adopting a survey design, the study integrates quantitative questionnaires with semi-structured interviews to ensure robust and valid findings. A cluster sampling technique was utilized, leading to the selection of a representative sample of 230 participants from community gardens in Georgetown, Penang (Northern region), Kuala Lumpur (Central), Kuala Terengganu, Terengganu

(East Coast), and Johor Bahru (Southern), all of which located within Peninsular Malaysia and engaged in the UAP initiative.

The analysis, which included descriptive statistics and Partial Least Square Structural Equation Modeling (PLS-SEM), revealed that the "Product" dimension, reflecting the program's overall impact, plays a significant role in determining the success of the UAP. Additionally, the "Process" dimension is crucial for understanding participant satisfaction and engagement. The findings indicate that the UAP has made substantial contributions to local food production, enhanced community food security, and generated both social and economic benefits. Nevertheless, the study identifies several obstacles, such as limited land availability, low engagement among younger demographics, and inadequate institutional support, which limit the program's wider adoption and long-term sustainability. To address these challenges, the research proposes a strategic framework that emphasizes the need for enhanced policy support, infrastructure improvements, and more appealing initiatives aimed at increasing youth participation.

Expanding the discussion on these issues offers deeper insights into the UAP's challenges and opportunities, highlighting their impact on the program's overall effectiveness and sustainability. These insights are pivotal for refining urban agriculture strategies in Malaysia, contributing to broader goals like Sustainable Development Goals (SDGs) 2 (Zero Hunger), 11 (Sustainable Cities and Communities), and 12 (Responsible Consumption and Production). Ultimately, this study not only enriches the academic discourse on urban agriculture and program evaluation but also provides practical guidance for developing frameworks that optimize urban farming practices, aiming to ensure food security and improve community well-being.

Keywords: program evaluation, urban agriculture program, CIPP, effectiveness, food security

SDG: GOAL 2: Zero Hunger, GOAL 11: Sustainable Cities and Communities, and GOAL 12: Responsible Consumption and Production

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

KEBERKESANAN PROGRAM PERTANIAN BANDAR TERHADAP KESELAMATAN MAKANAN DAN PEMAKANAN KOMUNITI DI SEMENANJUNG MALAYSIA.

Oleh

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Kajian ini menilai keberkesanan Program Pertanian Bandar (PPB) yang dikendalikan oleh Jabatan Pertanian (DOA) dalam meningkatkan keselamatan makanan dan pemakanan komuniti di Semenanjung Malaysia. PPB ini dimulakan sebagai tindak balas strategik terhadap cabaran yang timbul akibat pembangunan bandar yang semakin meningkat, yang mempunyai implikasi besar terhadap keselamatan makanan. Objektif utamanya termasuk mempromosikan kecukupan makanan, mengurangkan perbelanjaan makanan isi rumah, dan mengukuhkan keharmonian sosial. Kajian ini menggunakan model penilaian KIPP (Konteks, Input, Proses, Produk) untuk menyelidiki matlamat program, peruntukan sumber, kaedah pelaksanaan, dan hasil yang diperoleh oleh para peserta. Kajian ini mengaplikasikan reka bentuk tinjauan, menggabungkan soal selidik kuantitatif dengan temu bual separa berstruktur bagi memastikan penemuan yang kukuh dan sah. Teknik persampelan kluster digunakan, dan sampel yang mewakili terdiri daripada 230 peserta dari kebun komuniti di Georgetown, Pulau Pinang (Wilayah Utara), Kuala Lumpur (Pusat), Kuala

Terengganu, Terengganu (Pantai Timur), dan Johor Bahru (Selatan) iaitu semuanya terletak di Semenanjung Malaysia dan terlibat dalam inisiatif UAP.

Analisis yang dijalankan, termasuk statistik deskriptif dan *Partial Least Square-Structural Equation* Model (PLS-SEM), menunjukkan bahawa dimensi “Produk”, yang mencerminkan kesan keseluruhan program, memainkan peranan penting dalam menentukan kejayaan PPB. Selain itu, dimensi “Proses” juga penting untuk memahami kepuasan dan penglibatan peserta. Penemuan ini menunjukkan bahawa UAP telah menyumbang secara signifikan kepada pengeluaran makanan tempatan, meningkatkan keselamatan makanan komuniti, serta menghasilkan manfaat sosial dan ekonomi. Namun, kajian ini mengenal pasti beberapa halangan, seperti kekurangan tanah, penyertaan belia yang rendah, dan sokongan institusi yang tidak mencukupi, yang menyekat penerimaan program yang lebih luas dan kelestarian jangka panjangnya. Untuk menangani cabaran ini, kajian ini mencadangkan rangka kerja strategik yang menekankan keperluan untuk meningkatkan sokongan dasar, penambahbaikan infrastruktur, dan inisiatif yang lebih menarik untuk meningkatkan penglibatan belia.

Mengembangkan perbincangan mengenai isu-isu ini menawarkan wawasan yang lebih mendalam tentang cabaran dan peluang PPB, menekankan kesannya terhadap keberkesanan keseluruhan program dan kelestariannya. Wawasan ini penting untuk memperhalusi strategi pertanian bandar di Malaysia, selaras dengan Matlamat Pembangunan Mampan (SDG) seperti SDG 2 (Tiada Kelaparan), SDG 11 (Bandar dan Komuniti Mampan), dan SDG 12 (Penggunaan dan Pengeluaran yang Bertanggungjawab). Akhirnya, kajian ini bukan sahaja memperkayakan wacana akademik tentang pertanian bandar dan penilaian program, tetapi juga menyediakan panduan praktikal untuk membangunkan rangka kerja yang mengoptimumkan amalan pertanian bandar, dengan matlamat untuk menjamin keselamatan makanan dan kesejahteraan komuniti.

Kata Kunci: penilaian program, program pertanian bandar, CIPP, keberkesanan, keselamatan makanan

SDG: MATLAMAT 2: Kelaparan Sifar, MATLAMAT 11: Bandar dan Masyarakat Mampan, dan MATLAMAT 12: Penggunaan dan Pengeluaran Bertanggungjawab.

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بِسْمِ اللهِ الرَّحْمٰنِ الرَّحِيْمِ

"In the name of God, the Most Gracious, the Most Merciful

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
DOA	Department of Agriculture
DOSM	Department of Statistics Malaysia
MOA	Ministry of Agriculture and Agro-Based Industry Malaysia
MAFS	Ministry of Agriculture and Food Security
PLS SEM	Partial Least Squares Structural Equation Modeling
Q^2	Predictive Relevance
R^2	Coefficient of Determination
UA	Urban Agriculture
UAP	Urban Agriculture Program
VIF	Variance Inflation Factor
IPMA	Importance-Performance Matrix Analysis
MARDI	Malaysian Agricultural Research and Development Institute
CIPP	Context, Input, Process, Product
SDG	Sustainable Development Goals
NEM	New Economic Model
NAFAS	National Farmers' Organization
BERNAMA	Malaysian National News Agency
DKKB	Dasar Kebun Komuniti Bandar/Urban Community Garden Policy
KPKT	Ministry of Housing and Local Government
LAMAN	Landscape and Garden Festival
PBT	Local Authority
MAFS	Ministry of Agriculture and Food Security
KEBUNITI	Community Garden Project

CHAPTER 1

INTRODUCTION

This chapter provides an overview of the background of the study, focusing on Malaysia's agricultural sector, the nation's food security concerns, and the impact of urbanization. It also explores urban agriculture in Malaysia and introduces the concept of the Urban Agriculture Program (UAP). The chapter then presents the problem statement, research objectives, and the significance of the analysis for relevant stakeholders.

1.0 Introduction

Evaluation is described as a systematic investigation into the value or merit of an object, and it serves as a tool for practitioners and organizations to comprehend the strengths and weaknesses of their programs, pinpoint areas for enhancement, and provide evidence to support funding and decision-making (Kaimal & Blank, 2015). The role of evaluation is emphasized on enhancing decision-making, social accountability, and organizational learning (Grigg et al., 2016). According to Tyler (1950), evaluation is a method that assesses how well the goals of a program are being met. Therefore, program evaluation is essential for determining the effectiveness and impact of various initiatives, programs, and interventions (Grigg et al., 2016). Scholars have define evaluation as the systematic collection of data on program activities, characteristics, and outcomes to enable informed judgments, enhance program effectiveness, and guide decisions about future initiatives (Rallis & Bolland, 2004).

Meanwhile, researchers such as Kaimal and Blank (2015), Grigg et al. (2016) and Saunders et al. (2005), highlight the multifaceted nature of program evaluation, emphasizing the need to assess program need, theory, process, and outcomes. However, as the field of program evaluation is still evolving, there are ongoing discussions around best practices, methodologies, and the role of evaluation in driving program improvement and informing policy (Rallis & Bolland, 2004; Grigg et al., 2016; Kaimal & Blank, 2015). In the early establishments, Cronbach (1963) described program evaluation as a process of assessing a program's value through the implementation of various procedures, whether or not specific instruments are utilized. Evaluation can serve multiple purposes, such as improving program effectiveness, informing decision-making, demonstrating accountability, and generating knowledge about what works in a particular context.

A systematic and rigorous approach to program evaluation is essential to ensure the validity, reliability, and credibility of the findings. For agricultural extension initiatives, such evaluations are especially crucial, as they allow for an evidence-based assessment of how effectively these programs address fundamental issues faced by farming communities. Extension agriculture is defined as a collaborative process in which experts work alongside farmers, guiding them in identifying, analyzing, and solving production challenges through the adoption of improved farming practices (Grigg et al., 2016). Evaluating these initiatives is crucial for understanding whether these programs are achieving their intended outcomes for targeted communities and populations (Barnabas, 1984; Grigg et al., 2016). The literature strongly emphasizes the importance of agriculture extension program evaluations, highlighting a clear need for utilizing appropriate evaluation methods and designs to assess the impact of these programs on productivity, income, and food security (Grigg et al., 2016; Barnabas, 1984). Without such evaluations, any claims regarding the success or failure of these initiatives would lack substantiation, undermining both the credibility of the programs and their potential for securing future support.

Drawing on the foundational principles of program evaluation discussed thus far, this study explores the key approaches, frameworks, and methodologies in program evaluation with a particular focus on applications in the context of agriculture extension. Typically, agricultural extension programs prioritize the dissemination of knowledge and technologies from experts to farmers, guiding them to implement enhanced farming practices in the agriculture sector (Santuah et al., 2022). Similarly, urban agriculture programs adapt these principles to empower urban growers, community gardeners, and other stakeholders with the skills necessary to cultivate food effectively in small urban areas (Chatterjee et al., 2020). Evaluation of these types of programs is crucial for understanding their reach, effectiveness, and impact on the target populations. However, assessing the outcomes of such programs is particularly complex, as it requires considering a range of interconnected social, environmental, and economic factors that shape the success and sustainability of these initiatives (Suvedi et al., 2016). A thorough, multi-dimensional assessment is, therefore, imperative to fully grasp the potential and limitations of these agricultural initiatives.

1.1 Background of the study

The agricultural sector in Malaysia has long been a cornerstone of the country's economy, contributing significantly to its overall economic development (Zezza &

Tasciotti, 2010). Malaysia is diverse, encompassing both industrial commodities and agro-food products (Shamsudin & Vincent, 2020). However, policy emphasis has leaned towards industrial crop development at the expense of food production (Ahimaz et al., 2021). This strategic focus on exports, though beneficial for generating revenue, has inadvertently hindered the development of the domestic food sector, rendering it increasingly vulnerable to supply chain disruptions and external price shocks. Addressing this imbalance is therefore crucial to securing national food security, prompting a renewed focus on rejuvenating this crucial aspect of the agricultural industry (Fuglie et al., 2019).

Over the years, the Malaysian government has implemented a series of National Agricultural Policies (NAPs) to address the challenges faced by the sector. The First National Agricultural Policy, implemented since 1984, focused on export-oriented development, while the Second NAP sought to increase productivity and efficiency across agricultural operations, expanding farmland and developing the agro-based industry to enhance competitiveness (Sabran & Abas, 2021). The evolving domestic needs has led to the Third NAP, in effect from 1998 to 2010, which pivoted towards food security and the production of adequate, safe, and nutritious food, all while promoting sustainable agricultural development. The Fourth NAP (2011-2020) extended these objectives, emphasizing a market-oriented approach, sustainable resource management, and robust food security measures. The Fifth NAP (2021-2030) is the latest iteration that emphasizes sustainable development, smart farming and greater private sector participation.

Altogether, these policy shifts reflect the government's recognition of the need to balance the demands of industrial crop production with the importance of food security and sustainability (Arshad, 2017; Sabran & Abas, 2021). Such policies reflect a transformative understanding: that while industrial agriculture drives economic growth, it must not come at the expense of accessible, locally produced food supplies. In this context, urban agriculture has emerged as a practical and strategic response, by leveraging the potential of underutilized urban spaces to produce food closer to the point of consumption. Recognizing this potential, the government has already launched a program aimed at establishing sustainable and safe food sources in urban settings, which directly addresses the dual goals of self-sufficiency and reduced dependency on food imports.

Malaysia's rapid urbanization has driven the need for innovative approaches to food production and sustainability (Esa et al., 2023). As the population becomes more concentrated in urban centers, the demand for locally sourced, fresh produce has increased. Urban agriculture has emerged as a viable solution, allowing city dwellers to engage in food production within the confines of their own communities. The Malaysian government recognized the potential of urban agriculture, and in 2010, the Department of Agriculture established an urban agriculture division to promote agricultural activities in urban areas. This initiative indicates the government's commitment to support urban farming as a means to reduce the cost of living for urban residents and enhance food security. It is a crucial step toward sustainable urban food systems, presenting urban agriculture not only as a policy measure but as a pathway to improved quality of life.

The economic rationale for such initiative is supported by compelling statistics. According to recent data, Malaysia imports nearly 40% of its staple vegetable crops, including essential items such as corn, wheat, soybeans, and rice (Ahimaz et al., 2021). In 2022 alone, the country imported about RM 40 billion worth of agricultural products, with around RM 10 billion spent on vegetables, fruits and meat (Tao et al., 2023). Although Malaysia is largely self-sufficient in poultry, eggs and vegetables, it remains heavily reliant on imports for other staples like wheat, rice, and fruits (Nafisi et al., 2020). Experts argue that Malaysia has the capability to produce more than 80% of its vegetable needs and other critical agricultural products through urban and smart farming initiatives, if the right policies and incentives are in place (Arshad, 2017). Addressing the current reliance on food imports thus requires a dedicated push for initiatives that not only target urban farmers but actively encourage a broader demographic across all age groups to participate in sustainable food production.

Urban farming offers a transformative opportunity to reduce dependence on food imports, thereby strengthening the country's self-sufficiency. Recognizing this potential, the government has implemented numerous agricultural initiatives, including the Urban Agriculture Program (UAP) or the Community Agriculture Development Program, aimed at aligning the nation's progress with global standards. These programs go beyond food production as they are strategic efforts to elevate food safety, public health, and overall community resilience, reinforcing the nation's ambition to keep pace with developed countries.

Urban agriculture (UA) is increasingly recognized as vital for achieving sustainable urban development. It presents a comprehensive approach that contributes directly to several Sustainable Development Goals (SDGs), particularly those related to food security, sustainable cities, and public health. By integrating food production into urban settings, UA can enhance local food systems, reduce food deserts, and improve access to fresh produce, thereby addressing nutritional needs and food security challenges. The following synthesis examines how UA aligns with the SDGs and how it can be leveraged to enhance their achievement.

A principal contribution of urban agriculture is to SDG 2, which calls for ending hunger, achieving food security, and advancing sustainable agricultural practices. By integrating food production within urban settings, UA can enhance local food systems, address the prevalence of food deserts, and ensures access to fresh produce, thereby addressing nutritional needs and food security challenges in urban populations (Das et al., 2018; Kotykova et al., 2022). Additionally, urban agriculture can contribute to SDG 11, which focuses on making cities inclusive, safe, resilient, and sustainable. Well-managed urban farming initiatives not only can mitigate urban sprawl, but also enhance green spaces, and improve urban biodiversity, thereby fostering healthier urban environments (Azizi et al., 2022; Wang et al., 2024).

Urban agriculture also advances SDG 12 by fostering responsible consumption and production patterns. By utilizing local resources and reducing the carbon footprint associated with food transportation, UA supports the establishment of more sustainable urban ecosystems (Fargue-Lelièvre & Clerino, 2022; Qiu et al., 2023). Additionally, it enhances community resilience by creating local jobs and fostering social cohesion, which aligns with SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities) (Walker, 2015; Schwindenhammer & Gonglach, 2021).

The interconnections between urban agriculture and the SDGs present an opportunity for sustainable urban planning. As cities expand, striking a balance between development and environmental sustainability becomes increasingly critical. Urban agriculture can be a strategic component of urban planning that promotes sustainable land use, thereby contributing to SDG 15 (Life on Land) by preserving green spaces and promoting biodiversity (Kalfas et al., 2023). Furthermore, the integration of urban agriculture into city planning can enhance urban resilience against climate change, aligning with SDG 13 (Climate Action) by reducing the carbon footprint and enhancing food security in times of crisis (Pretty, 2018). The need for such integration becomes undeniable when viewed through the lens of both ecological stewardship and urban resilience.

According to Bezu and Holden (2014), agriculture forms the backbone of national development, fulfilling fundamental needs of the country and society. However, active participation in the agricultural sector requires more than access, as it demands expertise, continuous skill development, and problem-solving support. Here, advisory services become indispensable, ensuring that individuals have access to critical knowledge and skills necessary to guarantee the adequacy of food supply. Hence, agriculture extension agencies emerge as one of the supporting elements in the agriculture sector in promoting sustainable agricultural practices and improving food security, particularly in rural and urban areas (Tiraieyari, 2013).

In Malaysia, the Ministry of Agriculture and Food Security (MAFS) has introduced urban agriculture program to address the pressing issue of land shortage for agriculture, encouraging citizens to utilize available spaces for food production while also generating new income streams. Among the federal departments of MAFS, the Department of Agriculture Malaysia (DOA), established in 1905 with the primary mandate to implement government agricultural policies, plays a vital role in overseeing these initiatives. The DOA has designated extension workers specifically for the Urban Agriculture Program (UAP), tasked with disseminating essential knowledge and facilitating the transfer of sustainable technologies to urban farmers. Through this program, the DOA not only supports urban agricultural endeavors but also strengthens Malaysia's food security infrastructure by empowering citizens with the knowledge and resources to contribute actively to the agricultural sector.

The establishment of the UAP by the Malaysia Department of Agriculture in 2014 marked a significant advance in the pursuit of sustainable urban development. It is a program that empowers urban households to cultivate their own food, which the UAP directly addresses the pressing issues of food security and the rising cost of living. The program is a collaborative effort involving numerous government departments and agencies at both State and Federal levels, extending its reach to both urban and suburban areas. Such integration of agriculture into urban planning is critical for sustainable development, as it offers solutions to a myriad of challenges, including food supply, environmental greening, water and urban waste management, education and public health.

The rise of urban agriculture in Malaysia can be attributed to several factors, particularly the rapid rate of urbanization and increasing food security concerns (Nafisi et al., 2020). Malaysia has seen a significant influx of rural-to-urban migration, leading to a growing urban population that competes for access to food, education, and housing (Nafisi et al., 2020). Urban farming has been proposed as a strategy to address these challenges, providing multiple benefits to the urban community. Research has shown that urban agriculture can help improve food security, reduce urban poverty, and provide leisure and recreational opportunities for urban dwellers (Shamsudin et al., 2014; Nafisi et al., 2020).

Implementing successful urban farming programs in Malaysia faces several significant challenges. For example, the availability of suitable land, potential conflicts between urban farming practices and the surrounding environment, and varying levels of public engagement and knowledge (Nafisi et al., 2020). Malaysia's high cost of living, coupled with predominantly urban lifestyle, are also noted that may limit the appeal and feasibility of farming activities in cities (Shamsudin et al., 2014). The absence of institutional support and a strong policy framework to promote urban agriculture are another critical barrier (Salim et al., 2019). Without a supportive structure, urban farming initiatives risk remaining fragmented and less likely to evolve into a viable, long-term initiative. Furthermore, the lack of youth involvement is also a major concern that needs to be addressed to ensure the widespread adoption and sustainability of this practice in the country (Shamsudin et al., 2014).

An initial survey conducted with participants from community garden projects in the urban farming program revealed a number of challenges they faced throughout their involvement. Interviews were carried out with the Department of Agriculture, Malaysia, along with community garden participants to understand the issues encountered during the program's implementation. The feedback gathered from these interviews is as follows:

"*We need to call people also…some of that... aa... they some sort of like no interest about it. They only come when harvest…. because you will see a lot of problem you know. If you caught fever someone will go on leave.*"

(UAP Participant 1)

"*We are old senior citizen…not much young people want to involve...*"

"*The leader or the president not really active because he is already 62. So, he got sick problem, health problem la…. So, he comes in the morning for a while...*"

(UAP Participant 2)

"*Yes… the problem is participation… because they say this kind never ending, they need to come every day. I say…*"

(UAP Participant 3)

"*Drainage also one of the problems, all flooded you know. Until our plant seed, I put there all die...*"

(UAP Participant 4)

"*Honestly it is true. Most of those who are still involved in UAP are in their 40s to 60s and previously, efforts to connect with the community received little interest...*"

"*The community manages their own plots in the garden. We offer our help, but only in terms of technical advice without interfering with their space. Sometimes, when we show up, it feels like we are changing things, which they don't want. So, there's a certain way to guide them… it means they mostly need technical advice and often seek it...*"

(UAP Officer 1)

"*One more thing, in reality, if a place is really demanding, it typically requires male labor; the physical strength needed is beyond what women can manage. Women can help with lighter tasks like watering, but for the heavy work, it's not feasible...*"

"*That's usually for outdoor activities. Younger people typically prefer indoor tasks, like placing plants by the window or in the kitchen.*"

(UAP Officer 2)

"*Urban farming projects are often confused with commercial ventures. Commercial projects are primarily profit-driven, focusing on the owner's earnings. However, urban farming, while still needing to be profitable, prioritizes social benefits first, followed by economic gains and environmental impact. The goals are not limited to just money; they are not profit-oriented.*"

"*Our team has actually requested this from MAFS. When we receive significant funding for a program, we worry that the objectives might not be fully met. So, we also asked for funding to conduct an independent evaluation of the project's implementation…*"

(UAP Officer 3)

"*The report focuses more on participation levels… which remain unchanged. For example, if there were 20 communities involved last year, there are still just 20 this year. As for crop yields… communities are supposed to provide us with a report every month, but we still have to keep following up with them.…*"

"*We are the urban agriculture team at HQ, coordinating programs with the states… We are also responsible for the Putrajaya and KL areas, which do not have a state agriculture department. So, we handle both roles here… In terms of manpower, we are definitely short-staffed...*"

"*We have to go all out...we often end up working on Saturdays and Sundays. Community gardening typically happens on weekends, so it has become the norm for urban farming...*"

(UAP Officer 4)

The meeting session with urban agriculture officers and participants in the UAP revealed several issues and problems related to the UAP. A lack of consistent interest and commitment among participants emerged as a significant challenge, with many only showing up during harvest, while older leaders face health limitations that restrict their activity levels. Infrastructure problems, such as inadequate drainage, cause flooding and damage to plants, while demographic issues like an aging participant base and gendered task divisions, hinder the program's operational efficiency. Communication barriers also contribute to these challenges, with some of the community members seeking autonomy in decision-making, yet misunderstandings about the program's focus on social benefits over profitability lead to misaligned expectations. Resource management is another critical concern, with inadequate funding evaluations and understaffed teams leading to long work hours and ineffective management. Additionally, there are issues with consistent reporting from communities and stagnant participation levels, despite efforts to engage more people. Thus, these issues point to a need for improved engagement strategies, better infrastructure support, more effective communication, and enhanced resource management within the UAP.

Despite these challenges, previous studies have highlighted key factors that contribute to the success of urban agriculture programs in Malaysia. These include the availability of suitable land, the compatibility of urban farming with the surrounding environment, and the level of public engagement and knowledge (Othman et al., 2018). Although urban agriculture holds considerable potential benefits, many Malaysians remain unaware of its practices or benefits (Ahimaz et al., 2021). For some, the primary barrier lies in not knowing how to start, while others are simply not interested in adopting the practice. Factors such as prior knowledge and household values have been found to significantly shape the attitude of Malaysians towards urban agriculture (Shamsudin et al., 2014).

In this case, the involvement of extension agencies is pivotal to advancing sustainable agricultural productivity and ensuring food security. As Salehi et al. (2021) emphasize, agricultural extension and education programs must positively impact farmers. Effective agricultural extension programs and policies are, indeed, key to achieving higher production levels, as noted by Mahir and Abdelaziz (2011). Furthermore, Baloch and Thapa (2019) underline the need for well-implemented agricultural policies that address farmers' specific needs and challenges. An illustrative example is the Government of Pakistan's policy to provide agricultural services aimed at boosting production by equipping farmers with the necessary knowledge and technology (Baloch & Thapa, 2018).

Every program that has been implemented by the government must undergo rigorous evaluation to assess its current and future efficacy. This process is crucial for continuous improvement and alignment with the goal of fostering a dedicated agricultural community committed to food security. Programs, course materials, and program contexts should be tailored to build such commitment in order to create a resilient, self-sustaining agricultural industry. Key agricultural agencies, especially the DOA and local community leaders, need to work together to ensure that program content and objectives meet the community's needs. Evidently, holistic evaluations are essential to measure the effectiveness of every program developed, assessing both immediate outcomes and long-term impacts.

However, problems emerge when it is difficult for the agency to evaluate formatively and summative of the performance that has been achieved. For instance, assessing the Urban Agriculture Program (UAP) requires a timeline of four to five years after the participants have completed the course to capture lasting impacts on participants. Evaluating participants' knowledge acquisition, skill mastery, and productive outputs will reveal whether the program has facilitated meaningful knowledge transfer within the community. Such an assessment is critical for ensuring continuous improvement that aligns with industry needs and the country's food security goals.

Therefore, a study was conducted to assess the effectiveness of the Urban Agriculture Program using the CIPP evaluation model, which encompasses four critical dimensions: context, input, process, and product. As outlined by Stufflebeam (1971), the CIPP model provides a comprehensive framework for evaluation at various stages: before, during, and after program implementation. This approach not only supports program planning and administration but also enhances the quality of information used for guiding program development. The study also aimed to develop a model framework to further refine program implementation, ensuring its overall effectiveness in meeting program objectives.

Although the Urban Agriculture Program (UAP) has been in operation for over eight years, a crucial question remains: how effectively has the program met the goals and objectives set by Malaysia's Ministry of Agriculture (MOA)? Specifically, the program aims to encourage community engagement in the agricultural sector, particularly in urban farming, to produce healthier and safer local food sources, while also reducing the nation's reliance on food imports. Additionally, the UAP has the potential to enhance household self-sufficiency and improve community well-being. Yet, limited agricultural skills continue to present a significant barrier, which hinders broader urban participation in agriculture and, thus, the realization of these goals.

1.2 Problem Statement

Program evaluation is essential for assessing the merit and effectiveness of policies and initiatives aimed at addressing societal challenges (Joint Committee on Standards for Educational Evaluation, 1981; 1988; 1994; 2003). Such evaluations help identify successful interventions, inform decision-making, and support continuous improvement. In the present context, the DOA has placed a strong emphasis on urban agriculture since 2014 as part of its strategic response to food security challenges driven by rapid urbanization and globalization, aiming to meet the country's 2030 goals (Ali & Vaiappuri, 2022). The Urban Agriculture Program (UAP) promotes the cultivation of green spaces, fresh food production, foster community cohesion, enhance environmental sustainability, facilitate knowledge sharing, and provide additional income sources (Rezai et al., 2016; Awang, 2024).

Preliminary research indicates that UAP participants are predominantly senior citizens who have more time to dedicate to gardening activities, whereas youth participation is low due to limited interest in agriculture and a preference for more lucrative pursuits. Consequently, the government is striving to attract younger generations to participate in urban agriculture, equipping them with the knowledge and skills necessary to thrive as modern farmers (Firdaus et al., 2022). Furthermore, some community members have noted that current UAP activities and technology transfer efforts rely too heavily on conventional methods and do not significantly contribute to income generation. Despite these limitations, participants continue to engage in these activities, primarily to make use of available land, pursue their hobbies, and strengthen social bonds. However, many express a need for more comprehensive technical support, additional initiatives, and modern equipment from the DOA to sustain their efforts, citing inconsistent program monitoring and the frequent transfer of agricultural officers as barriers to effective program delivery.

Although UAP has been implemented for nearly a decade, there is a noticeable gap in comprehensive evaluations of the program's effectiveness, especially using structured models such as the CIPP (Context, Input, Process, Product) framework. Existing research predominantly address the socioeconomic impact of agricultural programs conducted by agencies like MARDI or focus on issues such as participant commitment, disease management, and high maintenance costs of urban farming (Baharom, 2018). While several studies have explored urban agriculture practices and participant empowerment (Tiraieyari et al., 2017; Tiraieyari & Krauss, 2018; Tiraieyari & Uli, 2011; Zainal & Hamzah, 2018), there remains a lack of thorough evaluation of government policies implemented through agricultural extension services within the UAP context. This gap emphasizes the urgent need for a comprehensive evaluation of the UAP's implementation to provide evidence-based insights for policy enhancement.

Given the diverse evaluation models available, the CIPP model, developed by Stufflebeam, is particularly suitable for assessing program quality, design, and effectiveness as it provides a holistic view that incorporates the context, inputs, processes, and products of a program. The model is widely endorsed in academic and professional settings for its emphasis on program improvement, accountability, and alignment with dynamic real-world conditions (Noori et al., 2022). Its application is essential for capturing participant perspectives and advancing the goals of urban agriculture to enhance food security. By employing the CIPP model, this study aims to fill the existing research gap by conducting a comprehensive evaluation of the UAP's effectiveness, offering valuable insights to guide policy decisions and support the Malaysian government, particularly the Ministry of Agriculture and Food Security

(MAFS), in optimizing urban agriculture outcomes and ensuring sustainable food security for urban communities.

1.3 Research Questions

1) How effective is the **Context** dimension in terms of the appropriateness of the objectives and goals of the UAP among the program participants?
2) How effective is the **Input** dimension in terms of the quality of course support, training, incentive resources (equipment), extension services, exhibitions, and demonstrations provided in the extension activities among UAP participants?
3) How effective is the **Process** dimension in terms of the implementation strategy in achieving the objectives of the UAP based on the CIPP Evaluation model?
4) How effective is the **Product** dimension, which includes impact and changes on UAP participants based on the CIPP evaluation model?
5) What is the outcome of **Program effectiveness** dimension, as the overall impact?
6) What is the relationship between Process, Input, Process and Product towards Program Effectiveness of UAP?
7) What is the most suitable framework for enhancing the execution of an urban agriculture initiative?

1.4 Research Objectives

This study aims to evaluate the UAP using the CIPP evaluation model and develop a framework for improving UAP implementation. The study objectives are as follows:

1. Research Objective 1
   a) To evaluate the level of effectiveness of the **Context** dimension in terms of the appropriateness of the objectives and goals of the UAP among the program participants.
   b) To evaluate the level of effectiveness of the **Input** dimension in terms of the quality of course support, training, incentive resources (equipment), extension services, exhibitions, and demonstrations provided in the extension activities among UAP participants.
   c) To evaluate the level of effectiveness of the **Process** dimension in terms of implementation strategy in achieving the UAP objectives.
   d) To evaluate the level of effectiveness of the **Product** dimension in terms of impact and changes to the participants.
   e) To evaluate the level of **Program Effectiveness** dimension in terms of program outcome for the UAP's overall impact.

2. Research Objective 2
   a) To determine the relationship between the CIPP (Context, Input, Process, Product) and Program Effectiveness of UAP.
   b) To develop a framework for improving UAP implementation.

1.5 Research Hypothesis

Based on Research Objective 2a, the following hypotheses are to be tested:

H_{a1}: There is a significant relationship between Context and Program Effectiveness of UAP

H_{a2}: There is a significant relationship between Input and Program Effectiveness of UAP

H_{a3}: There is a significant relationship between Process and Program Effectiveness of UAP

H_{a4}: There is a significant relationship between Product and Program Effectiveness of UAP

1.6 Scope of the Study

This study focused on assessing the Urban Agriculture Program (UAP) under the Department of Agriculture (DOA) by targeting participants in community gardens who have directly benefited from incentives and technical guidance provided by the DOA. To ensure relevance to the research objectives, the scope is limited to individuals officially registered with the DOA and actively involved in community gardening activities. By narrowing the scope to these registered participants, the study aims to capture insights that reflect the impact of the UAP on those who are most likely to benefit from its resources and guidance. Excluding individuals, institutions, and community members not registered with the DOA or not actively participating helps maintain a concentrated focus on program efficacy as perceived by its core beneficiaries and avoid the dilution of insights by respondents who lack direct engagement with the department's resources.

The study also specifically includes participants actively engaged in community gardening. This criterion ensures that respondents possess the necessary involvement and experiential knowledge to offer well-founded insights into the program's strengths and weaknesses. Therefore, by focusing on insights from these individuals, the study can accurately assess the impact of the UAP on its target population. This focus aligns with the study's aim to assess whether the UAP has successfully achieved its objectives in fostering sustainable urban agriculture practices, improving food security, and enhancing community cohesion.

To obtain these insights, a survey questionnaire was employed as the primary research instrument, with data collection was conducted from August 2022 to December 2022. The findings from this study aim to enhance the performance and impact of the UAP, providing actionable feedback to inform program improvements that can reinforce its role in advancing Malaysia's urban agriculture initiatives.

1.7 Significance of Study

The main objective of this research is to evaluate the Urban Agriculture Program (UAP) in its entirety by identifying essential components that together provide a robust model for assessing urban agriculture activities. This research is driven by the need to explore the field of formal program evaluation, where real-world assessments offer valuable insights into program efficacy and reveal areas for potential enhancement.

At its core, this research seeks to systematically assess the current implementation of the UAP by the Department of Agriculture (DOA). By employing structured evaluation tools, the study will provide an in-depth analysis of the program's effectiveness and identify areas where the UAP could be strengthened. This approach not only illuminates the UAP’s present successes and limitations but also highlights the importance of continuous monitoring to support the DOA in achieving its objectives related to urban agriculture.

This study adds to the body of knowledge in the field of program evaluation by closely examining both the implementation status and outcomes of the UAP. In doing so, it offers valuable insights that can be used ass manual for improving instructional strategies that are specifically designed for the DOA’s UAP. The study’s findings are expected to guide the development of future training materials, guaranteeing that instructional tactics are implemented in a way that aligns with the practical demands of UAP execution.

The insights derived from this research have broader implications beyond immediate program improvement. By establishing a reliable evidence base on UAP implementation, this study seeks to provide policymakers, program developers, and strategic planners with actionable data that can inform policy revisions, advance program enhancements, and support strategic decision-making inside the UAP’s framework. Ultimately, this research hopes to make a significant contribution to the discourse on effective program execution and assessment in the field of urban agriculture.

1.8 Operational Definitions of the Terms

The operational definition described here is a specific term employed for the purposes of this study. An operational definition is one used to describe the respondents, or the variables being tested or manipulated in a study (Yasin, 2017). All definitions presented are relevant to this study. These are:

1.8.1 Urban Agriculture Program (UAP)

The DOA, Malaysia, defines urban agriculture as the cultivation, processing, and marketing of food in urban and suburban areas, utilizing intensive methods and recycling resources and wastes to produce a variety of crops and livestock. In the context of this study, urban agriculture program is any of the agricultural activities conducted by community in urban and suburban areas under the DOA's program.

1.8.2 Program Evaluation

Evaluation is a process that provides information for decision-making (Stufflebeam, 2006), and it involves systematical application of scientific methods to assess a program's design, implementation, or outcomes (Rossi & Freeman, 1993; Short et al., 1996). In this study, evaluating the UAP seeks to determine its effectiveness as managed by the DOA in Peninsular Malaysia. Program improvements are recommended based on strengths and weaknesses identified in the evaluation findings.

1.8.3 Context Evaluation

The context dimension refers to the aspects of initial needs contained in a program or activity that is focused on the existing environment and conditions (Ishak, 2019; Yasin, 2017). It also refers to the evaluation of program's goal and direction of the UAP by the DOA, Malaysia.

1.8.4 Input Evaluation

Input evaluation aims to improve existing strategies while also meeting planning procedures and expenses (Ishak, 2019). In this study, human resources, materials and financial resources were evaluated to determine the extent to which they support training contents, incentives (equipment and finance), and advisory services in UAP's extension activities.

1.8.5 Process Evaluation

The goal of process evaluation is to monitor program progress so that the goals and objectives of each program are met as planned and expected (Yasin, 2017). In this study, the process evaluation refers to the evaluation of strategy used to implement and deliver UAP extension activities.

1.8.6 Product Evaluation

Product evaluation is also known as outcome evaluation (Ishak, 2019). In the scope of this study, product evaluation includes evaluating the outcomes focusing specifically on the impact on the community.

1.8.7 Program Effectiveness of UAP

In this study, program effectiveness is assessed as an outcome that represents the UAP's overall impact. Program improvement can be made based on the evaluation of the program's effectiveness once strengths and weaknesses have been identified.

1.9 Thesis Organization

This thesis consists of five (5) chapters. The first chapter presents the introduction, providing the background of the study, problem statement, research questions, research objectives, significance of the study, and operational definition of terms. The second chapter provides an in-depth review on the theory of evaluation, CIPP Model as a program evaluation tool, as well as research and practice gaps. The third chapter outlines the methodology, including the research design, conceptual framework, the location of the study, population and sample size, data sources, instrumentation development, and data analysis techniques. The fourth chapter presents an analysis of the findings, and the thesis concludes with the fifth chapter providing the summary, conclusion, and recommendations for further research.

CHAPTER 2

LITERATURE REVIEW

This chapter offers an in-depth review of the existing literature relevant to the research topic, establishing a deeper context and significance for the study. It then presents an overview of the theoretical framework, evaluation models, and prior research concerning program evaluation and urban agriculture. The chapter concludes with a discussion on data collection and analysis methods conducted by previous studies.

2.1 Alkin's Evaluation Theory Tree

Evaluation as a field has undergone a significant evolution as it continually adapted in response to societal shifts. From its early beginnings in the Greater Society in the 1960s, the profession expanded through the golden years of the 1970s and evolved during the Reagan era, focusing on accountability and efficiency. By the 1990s, evaluation practices had matured, with increasing emphasis on results-driven evaluation. Currently, the practice and profession of assessment are marked by several innovative approaches. Each of the evaluation models is applied based on its relevance and appropriateness to the study's objectives to find solutions to the problems.

The evaluation theory tree introduced by Carden and Alkin (2012) organizes the theory of comparison into three main branches, namely the use, methods, and valuing. These branches illustrate distinct pathways and models that experts in evaluation often follow. According to Alkin's concept of evaluation theory, in his own words *"…while (theory) is conventionally used in evaluation literature, in some ways, it would be more* *appropriate to use the term approaches or models*" (p.4). Alkin's tree structure, specifically at the base of the trunk (Figure 2.1), consists of essential elements that anchor evaluation theory, including social accountability, social inquiry and epistemology.

The roots are:

- **Social accountability and control** – provide the rationale for evaluation. Social accountability, for example, presents an important motivation for evaluation, especially for programs funded by government entities. Rather than restricting, Alkin (2012) argues that social accountability serves to improve programs and aligns them more closely with social goals.
- **Social inquiry** – comprises the methods used to collect the information needed to determine accountability. Alkin (2012) emphasizes the importance of a methodologically sound and justifiable approach, advocating for procedures that allow for accurate, reliable accountability assessments.
- **Epistemology** – the inquiry into the nature and boundaries of knowledge within evaluation. It examines how we distinguish knowledge from beliefs, emphasizing methods to ensure reliability. In evaluation, epistemological debates often address the validity of meaning statements, the existence of universal claims, and the view that reality (or fact) is what makes it to be (Alkin, 2012).

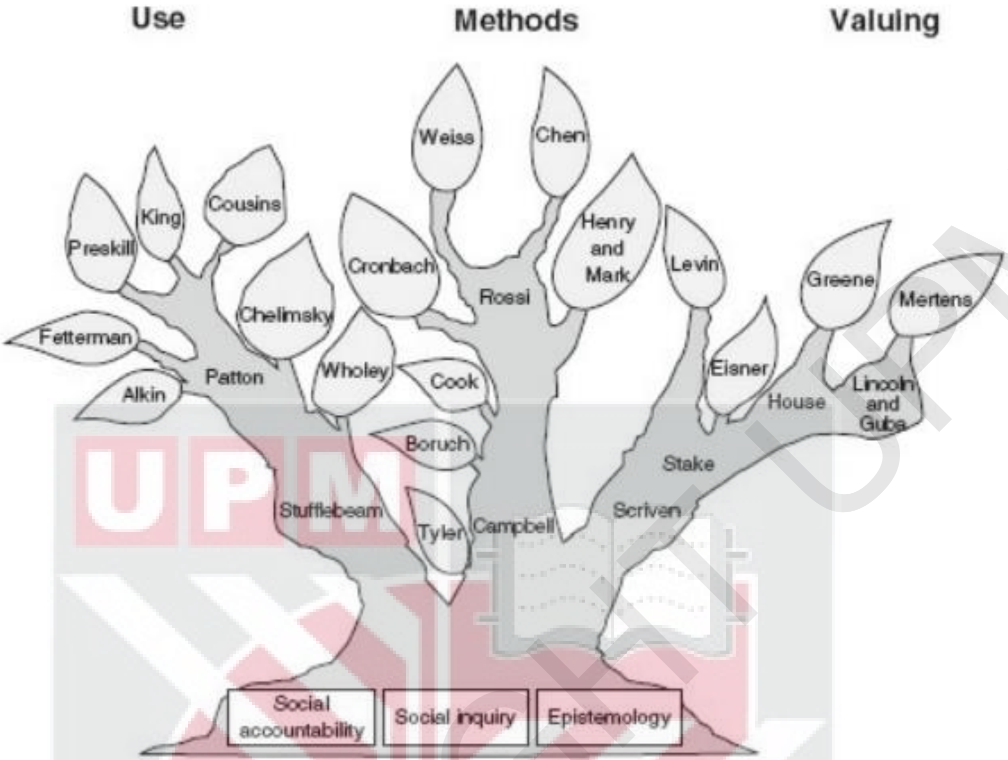


Figure 2.1: The Evaluation Theory Tree

The three primary branches of the evaluation theory tree are:

- **Use** – This branch emphasizes ensuring that evaluation findings effectively reach and influence the intended audience. It is pioneered by Daniel Stufflebeam (with initial contribution from Egon Guba) and later expanded by Joseph Wholey. The perspective originally focused on the critical function of evaluation as a tool for informed decision-making. In essence, the analysis carried out by these theorists reflects an explicit concern about the ways in which the assessment information will be used and focuses primarily on those who will use the information.
- **Methods** – The central branch of the evaluation tree originating from the social inquiry root. This is the branch of the tree in which evaluation is primarily

guided by research methodology. In this domain, the theorists are concerned with obtaining the most comprehensive knowledge possible, given the contextual constraints. Shadish, Cook and Leviton (1991) describe this objective as contributing to the "construction of knowledge" Alkin (2012) further refines this perspective suggesting that these approaches more accurately emphasize the methodologies, specifically the techniques used in the conduct of evaluation studies, rather than just the methods used to conduct such studies.

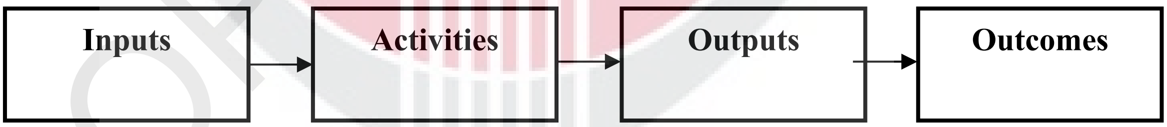
- **Valuing** - This is what distinguishes evaluation from research. Evaluators must place value on their findings. This valuing branch was driven initially by the works of Michael Scriven (1967) and Robert Stake (1967, 1975), who have firmly established the critical role of assessment in this work. Theorists in this branch maintain that it is important for the method to place value on the subject of the assessment, evaluand, arguing that this practice lies at the heart of the evaluation process.

Figure 2.1 illustrates the placement of theorists on each branch in a way that represents not only their primary focus, but also their secondary emphasis of specific evaluation approaches. This arrangement not only shows the relational dynamics between different theoretical contributions, but also the diverse perspectives within the field. The evaluation theory tree is a visual representation of key theorists' contributions to evaluation theory. It explains how these concepts have helped to build and influence the wider body of literature on assessment theory. Although each theorist represented has enriched the theoretical landscape in unique ways, the theory tree does not attempt to represent the full arrange of evaluation approaches (e.g., theoretical-driven evaluation, participatory evaluation) in the wider context of the evaluation theory literature (Alkin, 2012). Therefore, Alkin (2012) populated the tree with theorists most prominently associated with the foundational aspects of each approach; those who have made the initial, most notable and substantial contributions to each of the particular approaches.

2.2 Comparison of Evaluation Models

2.2.1 Logic Model

A program theory or logic model describes how an intervention's operations are understood to lead to a chain of outcomes, resulting in the expected or real impacts (from short-term outputs to medium-term outcomes). This framework is often displayed in formats such as the example provided below, though alternative representations may better suit specific evaluative purposes.



One commonly used method for demonstrating the core principle of a program is the logic model. It is most frequently presented in the form of a flow chart showing the relations between program elements and projected outcomes. Key components of a logic model include the following elements:

- ***Inputs*:** resources or materials (e.g., money, staff, volunteers, facilities, equipment, supplies, ideas) used by the program to provide its activities.

- *Activities*: any services that the program offers or work it performs to fulfil its mission.
- ***Outputs*****:** direct products of program activities, represented in quantifiable terms (e.g., number of classes taught, number of people served, number of educational materials distributed, or number of hours of service supplied).
- ***Outcomes***: any aspects of the participants that are supposed to improve as a result of the participant's receiving the services, according to the program activities. These may include improved health, new knowledge, better skills, and higher income.

(Wilder Research, 2009)

The logic model serves as a foundational tool for program designers that enable them to make informed decisions that shape the program's evaluative framework. It also acts as a strategic assessment tool, guiding initial design choices and influencing the program's long-term evaluation trajectory. For instance, by mapping out specific program elements that will benefit from rigorous assessment, logic model supports continuous improvement throughout the program's life cycle. Once the activities and processes requiring evaluation are identified, program planners can then decide what types of data needed (those that are available or can be generated), how data will be collected and evaluated, and then assign responsibilities for each stage of data management. This iterative process is most effective when stakeholders engage in a robust review and revision of the logic models.

An appraisal is most useful when it has been thoroughly designed and applied (Silverman et al., 2015). In contexts such as organizational planning or results-based evaluation, the model can be very useful for coordinating both planning and analysis efforts. This approach proves invaluable in specific scenarios, such as crafting grant proposals, where a clear definition of organizational aims and program scope is crucial. One of the primary advantages of the logic model is its emphasis on measurable outcomes or results, which allows a clear distinction between mere activity and actual impact. By calculating outcomes and results, organizations can avoid wasting resources, such as time and money (inputs), that might otherwise be squandered on unproductive tasks or outputs that fail to meet strategic goals. Ultimately, it is these effects (impacts, particularly long-term effects) that justify the work and lend meaning to the efforts undertaken.

However, logic models present potential drawbacks, notably due to their tendency to oversimplify complex program (Knowlton et al., 2013). For instance, the logic model often captures only partial representation of a complex system, where the program logic depicted may not always reflect on-the-ground realities. In essence, it is a representation and does not embody reality itself. Programs, by nature, rarely follow a linear progression and the model may overlook unforeseen or secondary effects that emerge outside of its original framework. Additionally, causality is not always established by the model alone, as results are frequently influenced by numerous variables beyond the program's immediate scope. As noted by Wilder Research (2009), stakeholders may have reservations or concerns about creating a method for the logic model, or they may question the model's ultimate usefulness.

2.2.2 Kirkpatrick’s Evaluation Model

Donald L. Kirpatrick introduced his four-level evaluation model in the 1950s that aimed to increase the efforts in evaluation training programs. Since then, it has gone under multiple revisions, but its core structure remains anchored in four main levels, where Level 1: Reaction, Level 2: Learning, Level 3: Behavior and Level 4: Results.

Kirkpatrik and Kirkpatrick (2006) describe these four levels as:

a) **Level 1: Reaction** – This initial level captures participants’ immediate responses to the program, with a focus on their perceptions and satisfaction with the content and delivery.

b) **Level 2: Learning** – This level measures changes in participants’ knowledge, skills, or attitudes, assessing whether these have grown. Evaluation at this level takes place over the period of program conduction through either a knowledge demonstration, tests or other assessment tools.

c) **Level 3: Behavior** – This level evaluates the extent to which participants apply their newly acquired knowledge, skills, and/or attitudes to their work. This level of evaluation often takes place as a post-training evaluation, typically through observations by managers, lecturers, or supervisors.

d) **Level 4: Results** – This level involves examining the broader organizational outcomes attributable to the training. It evaluates metrics such as productivity, quality improvement, cost reduction, and employee retention, linking these to the program's long-term value and effectiveness.

However, despite its widespread adoption, Kirkpatrick's model has certain limitations. For instance, it does not take into account the broad number of individuals, organizational, and program design elements and delivery factors that can affect training outcomes at different stages, i.e., before, during or after training. Moreover, the model operates independently of the learner's broader context, including their specific cultural and systemic influences. Another concern is its implicit assumption that each successive level yields a more comprehensive understanding of the training's impact, suggesting that Level 4 provides the most meaningful evaluation data.

2.2.3 CSE-UCLA (Center for the Study of Evaluation-University of California in Los Angeles) Evaluation Model

The CSE-UCLA model is a five-dimensional evaluation model designed to evaluate service systems essential to sustaining human life. It consists of five essential components: assessment of the system, program preparation, program execution, program enhancement, and certification. Alkin (1969) developed the model at the University of California, Los Angeles, representing a systematic approach to evaluation that has since been widely applied to evaluate educational, political services, and other fields related to human life-service programs.

The UCLA evaluation model is similar to the CIPP (Context, Input, Process, Product) Assessment Model. Central to Alkin's philosophy is the notion that evaluation is a process of selecting the right information, collecting and analyzing, and reporting information to produce actionable insights. The five components of the CSE-UCLA evaluation model are described as:

1) **System assessment** is equivalent to context assessment in the CIPP evaluation model.
2) **Program planning** is similar to input assessment, where programs that need to be evaluated are selected based on educational needs.
3) **Program implementation** ensures that the program is delivered to the intended target group.
4) **Program improvement** is akin to process evaluation. This stage involves gathering information about a program that works, whether the objective is achieved and determining whether the unexpected outcome exists.
5) **Program recognition** is equivalent to a product evaluation. This final assessment seeks to establish the program's value and the potential for future application.

According to Vokasi et al. (2018), the model exhibited limitations in accurately representing each assessment factor as it fails to differentiate between the highest and lowest categories. This is supported by Divayana et al. (2018), who examined the CSE-UCLA evaluation model and revealed the challenges in incorporating new aspects automatically. The findings suggested that the model was only able to provide qualitative and quantitative general view for each evaluation component and lack the flexibility needed for detailed assessments.

2.2.4 Summary of Comparison of Model Evaluations

Various models have been proposed by experts as frameworks for assessing programs. The selection of an appropriate model would be depend on several criteria, including the context, the purpose and the expected outcome of the evaluation (Nouraey et al., 2020). Table 2.1 categorizes evaluation models according to their primary purpose. Among the most prominent are the CIPP model founded by Stufflebeam and his colleagues, the Tyler Model, UCLA Model, Scriven Model, and Logic Model, among others. Each of these models offers distinct strengths and weaknesses, which necessitates evaluative expertise to implement them effectively. This section focuses only the evaluation model commonly used in evaluating a program.

Table 2.1: Models of evaluation according to the purpose

Evaluation Model	Objective Model				
	Achieve Program objective and purpose	Improvement Program	Program Accreditation	Theory Development	Impact to the Program
Objective Model (Tyler, 1942)	×	×			
Goal – Free Model (Scriven, 1972)					×
UCLA (Alkin, 1969)	×	×			×
CIPP (Stuffllebeam, 1973)	×	×			×
Multilevel (Guskey, 2000; Kirkpatrick, 2001)		×	×		×

(Sources: Pang, 2019; Marina, 2016)

2.3 Selected Evaluation Model

The evaluation model used in this study is the CIPP model developed by Stufflebeam in the 1960s, which evaluates programs through four key dimensions: context, input, process, and product. These components, which form the CIPP acronym, reflect an empirically oriented approach to evaluation. The model aligns with the perspective that evaluation should generate data that informs improvements and guides strategic decision-making (Pal, 2014).

2.3.1 CIPP Evaluation Model

Stufflebeam's (1983) CIPP model was designed to provide decision-makers with meaningful insights for program assessment and refinement. Basically, the CIPP model addresses four key questions: 1) the goals to be established, 2) the procedures to be used, 3) the appropriateness of these procedures, and 4) the effectiveness of objective achievement. These core questions shape the four dimensions of evaluation (Figure 2.2). Although each dimension may be examined individually, a comprehensive evaluation of extension projects benefits from the focus on all four components. The CIPP model emphasizes that the purpose of evaluation is to improve, rather than to prove, program efficacy (Stufflebeam, 1983).

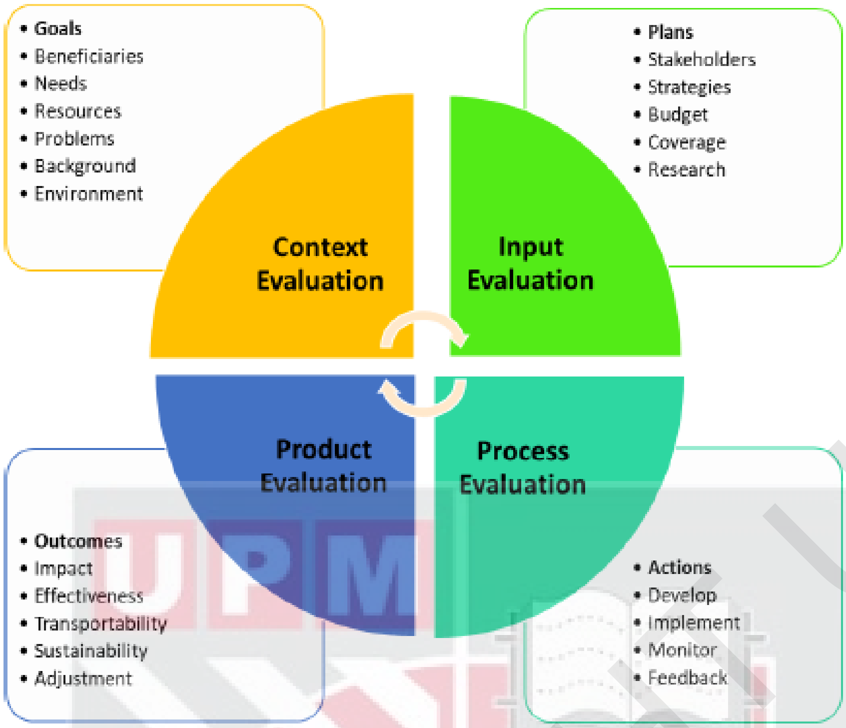


Figure 2.2: The CIPP Model by Stufflebeam (2003)

Stufflebeam (1983) describe context evaluation as the focus on identifying the target population, assessing needs, diagnosing problems, and evaluating whether program objectives align with the needs. Input evaluation involves selecting the most appropriate action plan from various alternatives, considering factors such as account resources, strategies, budgets, and schedules. Process evaluation examines whether the project is progressing according to the plan, which enables early detection of potential procedural and implementation flaws. Finally, product evaluation assesses outcomes against established targets, whether the program effectively addresses the needs of the participants.

In practical terms, context and input evaluations shall be carried out before the program is conducted. Process evaluation is initiated at the beginning of the program, while product evaluation is conducted at the end of the program. Context evaluation establishes the foundation by defining the environment (type of social structure) in which the program is to be carried out. Input evaluation then provides a basis for assessing implementation by providing information on how and why, among other alternatives, the specific action plan was chosen. Process evaluation provides insights into program's evolution by documenting what has happened between inputs and products, while product evaluation provides the basis for decisions on the continuance, termination or modification of the program being evaluated.

There is no single, universally applicable approach to evaluate extension projects across diverse contexts (DeHegedus, 1994). The Stufflebeam model offers a structured framework that facilitates systematic planning of evaluations in extension program. Through this approach, evaluations aim to bring clarity and coherence to complex and often ambiguous scenarios. Given the diverse objectives of these programs, evaluations should not be constrained solely to measuring outcomes, rather a multidimensional perspective is necessary. The Stufflebeam model advocates for a holistic, comprehensive approach, in which the different components of the extension program are treated equally throughout the situation. Such approach requires evaluators to make value judgments, recognizing that the significance of each element is determined by evaluative principles and subjective perspectives. The explicit use of these values, together with the use of a logical conceptual framework and empirical measurements, is needed to evaluate them effectively (Fathy, 1980).

The CIPP model helps shape progress even though the project is already underway. It offers adaptable, stepwise procedures that are both accessible and applicable across various cases or scenarios. This flexibility allows for assessments at any phase: before, during or after the implementation of the program. With its emphasis on gathering comprehensive information, the model aids decision-makers by providing insights that are beneficial not only for the current program but also as a reference for future initiatives. In line with the aim of this study, the CIPP is thus employed as the model for evaluating the implementation scope of the Urban Agriculture Program by DOA.

2.3.2 Significance of Using CIPP Evaluation Model

The CIPP Evaluation Model offers a comprehensive framework suited to both summative and formative evaluations, making it a versatile tool for assessing programs at various stages. Formative evaluation is most used during the development or modification phases of a program or course. It provides feedback to refine and enhance the program. Summative evaluation, on the other hand, is used for making judgments about the efficacy of a program or course upon its conclusion (Aziz et al., 2018). By encompassing these two evaluation types, the CIPP model supports a holistic view of program effectiveness that aligns with the goals of this study, which aims to examine both ongoing and overall impacts of the UAP.

The strength of the CIPP model lies in its multidimensional approach. It evaluates the program from four key perspectives: context, input, process, and output, with each serving distinct but interconnected functions. Stufflebeam's evaluation model allows policymakers, program implementers, and any relevant stakeholders to evaluate and formulate a program, track the strength of a given program or service, determine the effectiveness of a practice, and contribute in terms of knowledge (Stufflebeam, 2000a). The crucial aspect that makes this model distinct from other models is that it focuses on the context for assessing the learning and development process (Stufflebeam & Shinkfield, 2007).

The CIPP approach, with its emphasis on aligning program objectives with broader organizational goals, offers a structured pathway for assessors and decision-makers to evaluate this alignment. This makes it particularly valuable as it enables stakeholders to determine whether a program remains relevant and contributes effectively to overarching aims (Finney, 2019). Moreover, it supports both formative and summative assessment components, which aligns with this study. With this model, decision-makers are equipped not only to analyze a program's progress but also to receive substantive feedback on the strengths and weaknesses of various components. This insight supports well-informed decisions regarding whether to continue, adjust, or terminate the program in question (Nouraey et al., 2020).

Its adaptability also allows evaluators to prioritize specific dimensions based on the program's objectives. According to Yahaya (2001), any four of the dimensions (Context, Input, Process and Product) can be applied collectively or adapted with a focus on specific areas, such as the dimension of Effectiveness. For instance, if a deeper understanding of a program's impact is necessary, the additional Effectiveness dimension to the analysis can provide further insights into areas that might require enhancement. However, it is crucial to carefully consider the research aim and objectives to determine if the additional aspect a necessity.

In the CIPP model, the evaluation of a product should considers its impact, effectiveness, transportability, and sustainability. This feature is particularly relevant for examining the initiatives like the present study, which investigates the DOA's UAP and its contributions to food security and community nutrition in Malaysia. In this context, the current research employs both summative and formative evaluation techniques to ensure accountability. These evaluations are critical, as they serve to identify potential improvements of the program while assessing its overall effectiveness and value it provides to the community.

The CIPP model emphasizes the importance of gathering knowledge and analyzing information to support well-informed decision-making. The insights obtained from such evaluations can be used as a reference and guidance to refine and enhance any stages of a project or study, including planning, preparation, implementation, and development. Furthermore, it helps direct the researcher's attention toward achieving important outcomes and ultimately help the broader group of users to gauge whether the initiative has succeeded in meeting its targeted objectives.

The "Impact" dimension is relevant in evaluating whether the outcomes of the UAP activities have directly impacted community (program participants) from a different of perspectives, such as improved in knowledge, practice, attitude, health, and lifestyle. Similarly, the "Effectiveness" dimension examines both the planned and unanticipated outcomes, as well as its ability to improve both the program and the delivery of agricultural technology for which it is intended.

Stufflebeam (1983) describes the assessment as a method of identifying, gathering and channeling information to assess program objectives, activities, and outcomes. The goal is to inform decision-making, enhance transparency and deepen understanding of the program. This assessment approach distinguishes between what a program actually produces and what it aims to achieve. Evaluation, as defined by Stufflebeam (2003), involves professional judgement that guides individuals in making informed decisions. Effective evaluations lead to assessments that can drive conclusions, inform changes, and address challenges arise in the program. While the principles of assessment and evaluation are commonly applied to teaching and learning, they are relevant to broader contexts of evaluation of curriculum and educational programs (Pang & Lajium, 2014, 2017).

In the context of UAP, CIPP-based evaluation is essential for gauging the program's effectiveness in addressing food security and sustainability challenges. It provides professionals and policymakers with evidence-based insights that drive accountability. By facilitating both formative and summative evaluations, the CIPP model remains an effective and balanced framework for evaluating UAP, combining theoretical depth with practical application to address the program's unique challenges and objectives.

2.4 Evaluation of Program Effectiveness (Dependent Variable)

Evaluating program effectiveness is crucial for determining whether it meets its objectives and for guiding strategic decisions about its future trajectory (Smith, 2015). Such an assessment requires competent personnel at all management levels (Jones, 2018). Continuous monitoring is essential to identify strengths and weaknesses, providing insights for program enhancement (Brown, 2019; Clark, 2019). Based on the conceptual framework for evaluating the effectiveness of the UAP implementation, the dimension of Program Effectiveness represents the program's comprehensive outcome, including a synthesis of results drawn from context, input, process, and product dimensions.

The assessment of program results encompasses the comprehensive evaluation of UAP, including their contribution to the enhancement of local food security through the dissemination of knowledge on food sources and the distribution of output within the region (Anderson, 2020). Evidence presented by Lee (2018) highlights how the distribution of produce by the UAP has been essential in improving food security. This initiative has resulted in participants and their families benefiting from increased access to a wider variety of nutritious food, leading to a more balanced and healthier diet. Consequently, the prevalence of certain health issues has been reduced, as highlighted by Garcia's (2017) findings. These developments highlight the crucial role of such initiatives in supporting societal well-being, which, in turn, propels national progress (Wang, 2019).

Salehi et al. (2021) argue that evaluation provides crucial feedback for improving development plans and programs, particularly by ensuring that program outcomes align with their stated objectives. Across various fields globally, studies have demonstrated the value of such evaluations. For example, Jamil et al. (2023) evaluated agricultural extension programs for rice farmers in Indonesia, while Sampson et al. (2023) assessed an interprofessional health curriculum in the United States. Similarly, Allen et al. (2006) explored how formal mentoring impacts program success, and Deniston et al. (1968) analyzed decision-making in public health. In the Middle East, Adaileh et al. (2023) studied strategic decision effectiveness in Jordan, and Eryanto et al. (2019) evaluated entrepreneurship practices. Research in Kenya by Bunyatta et al.

(2006) focused on Farmer Field School methodology, while Nugroho et al. (2020) assessed management effectiveness program on organizational performance satisfaction. Altogether, these studies highlight the global importance of evaluating program efficacy, providing insights that help refine programs to better achieve their intended impact.

Additionally, the assessment of targeted program, such as the Village-Owned Enterprise Program in Tokbesi Village, Indonesia, highlights the significance of employing robust evaluation standards. Maria et al. (2023) adopted a multifaceted approach by incorporating six distinct policy evaluation criteria namely, effectiveness, efficiency, adequacy, coherence, responsiveness, and precision to scrutinize the outcomes of agricultural projects. Such comprehensive approach emphasizes the need for adopting structured evaluation models to effectively measure program performance and its societal impact.

The research conducted by Laukaitis (2016) and Shuhod and Rashid (2020) add further depth to the discourse of evaluation with their examination on program effectiveness in distinct settings. Laukaitis (2016) underlines the importance of establishing a shared understanding of program effectiveness to ensure responsible management of federal funds. Although the study developed a tool aimed at assessing effectiveness, it faced reliability issues, as indicated by a negative Cronbach's alpha. This outcome suggested a flaw in one of the survey items, highlighting the need for further refinement of the tool before future implementation. Conversely, Shuhod and Rashid's (2020) investigation into the impact of entrepreneurship programs in Malaysian vocational and technical institutions found notable differences in program outcomes. Based on responses from 225 participants, they concluded that the Mobile Technical Services (MTS) program was highly effective, whereas the School Enterprise (SE) program had only moderate effectiveness. The research also pointed out that institutional collaboration with industry was notably stronger in the MTS program, potentially contributing to its success. Both studies emphasize the necessity of well-constructed evaluation methods and reliable instruments for accurately assessing program outcomes, acknowledging that different research contexts bring unique challenges.

A comprehensive review of prior studies in this domain reveals a significant gap in the evaluation of joint research and extension projects. While numerous researchers have explored various dimensions of these projects, there remains a distinct lack of studies assessing the effectiveness of such initiatives across different program dimensions. It is particularly evident that few, if any, studies have explored the multifaceted aspects of research and extension projects, particularly in the context of Malaysia.

Despite the prevalence of evaluation processes in studies assessing research and extension projects in Malaysia, there seems to be a notable absence of a specific evaluation model. Many studies have engaged in evaluation activities without the utilization of a structured framework. Recognizing this gap, the primary aim of this study is to address that void by evaluating the urban agriculture implementation model, with an emphasis on program effectiveness. This is achieved through the application of the Context, Input, Process, and Product (CIPP) evaluation model.

The CIPP model, known for its goal-oriented and comprehensive approach, serves as an ideal framework for this evaluation. By incorporating the CIPP model, this study aims not only to assess the traditional components of the research and extension projects but also to introduce an additional layer of analysis “program effectiveness”. This encompasses the overall achievement of the program, providing a more holistic understanding of its impact.

In summary, this study breaks new ground by not only addressing the gap in the evaluation of joint research and extension projects but also pioneering the use of the CIPP model to scrutinize the urban agriculture implementation model. It combines standard evaluation components with a focus on overall program effectiveness. This way, the research aims to generate meaningful insights that can guide the enhancement and optimization of urban agriculture initiatives in Malaysia. Effective program evaluation, as emphasized earlier on, requires a multifaceted approach that incorporates formative assessments, active stakeholder engagement, and established evaluation frameworks. By employing these strategies, evaluators can ensure that programs not only meet their objectives but also adapt in response to feedback, ultimately leading to better outcomes for participants and communities.

2.5 Elements in CIPP (Independent Variable)

Through the CIPP evaluation model, the process of assessing the efficacy of the program starts with the regulatory agency that runs the framework (course or program), followed by a first-level evaluation of the context by identifying aspects of the plan extension goals and the outcomes of the program extension (Yasin, 2017). In the context of evaluating the UAP, the aim of this study is to evaluate the effectiveness of implementing the UAP and how it is incorporated into research and development

(R&D), especially in urban and suburban areas under the direction of the DOA. By focusing on improvement-oriented evaluation, the model facilitates informed decision-making concerning instructional courses or programs.

In applying the CIPP model, the research delves into questions, problems, and conceptual inquiries, in the hope of uncovering insights that can lead to meaningful advancements. The second stage is the assessment of inputs based on program material, learning outcomes of the course, expertise and skills of extension agents, and demonstration and learning equipment. The subsequent stage entails evaluating the method that focuses on implementing the technology transfer and learning process, the use of inputs and demonstration materials, the use of demonstration and learning facilities and equipment and evaluation. The final stage is the product evaluation, focusing on the mastery of knowledge, abilities, and soft skills developed through the program. It is at this dimension of product that decisions must be made on whether to terminate, defer, proceed, and modify the course. In cases where modifications are necessary, evaluators must conduct a thorough analysis to identify and address any deficiencies in order to refine and enhance the program (Yasin, 2017).

The application of the CIPP model in evaluating the UAP begins with expert evaluation, followed by an assessment conducted at the DOA level. This systematic process is designed to identify gaps and problems in the implementation of the UAP at the DOA.

2.5.1 Context Dimension

The Context aspect of the CIPP model discusses the concerns and forces of change that drove the agriculture system under the DOA to consider the need for establishing the Urban Agriculture Program (UAP). Stufflebeam and Shinkfield (1985) describe contextual assessment as a process of identifying the strengths and weaknesses of a program's declared objectives. This component of the CIPP model embodies a comprehensive understanding of the context, which encapsulates the educational objectives of the program and learning outcomes of the program. In this study, Context Evaluation explores the overarching purpose and specific objectives of the UAP as outlined by the DOA (2022):

1) Purpose

The UAP, also known as the Community Agricultural Development initiative, strives to assist households in mitigating the cost of living expenses by encouraging self-production of food through guidance provided by the Department of Agriculture. This program involves residents, schools, institutions, and urban agricultural entrepreneurs, in collaboration with various departments and agencies at both the state and federal levels.

The Community Agricultural Development Program serves as a strategy to promote social interaction among community members. By empowering participants to collaborate, this program nurtures teamwork and the collective pursuit of producing food, which can be consumed or sold for supplementary income. This communal endeavor not only elevates morale but also cultivates a sense of shared purpose and accomplishment.

2) Objectives

The specific objectives of the UAP are outlined as follows:

a) Assisting households in reducing the cost of living.

b) Establishing sustainable community agricultural activities that ensure the availability of high-quality food.

c) Promoting community engagement and facilitating meaningful communication within the community.

According to Mohd Isa (2011), the first step of implementing any program is ensuring that participants understand its core principles. This understanding lays the foundation for aligning participants' expectations with program outcomes (Yasin, 2017). The program's aims or goals should be clearly communicated to participants and other stakeholders. While these goals outline the overarching aims of the program, the objectives serve as a more targeted function. Objectives represent specific, actionable milestones goals that are design to align with the overall purpose and address stakeholders' needs. By clearly defining these objectives, programs can outline the expected outcomes participants are expected to achieve by the end of the program, ensuring that all involved parties share a cohesive understanding of the intended impact.

2.5.2 Input Dimension

The emphasis on input variables underlines the core concept and guiding principles that shape the strategies used by developers, as well as the resources utilized by the DOA in designing and executing the program. Evaluating the input dimensions is essential to understanding how resources contributed to achieving program goals and objectives (Yahaya et al., 2008). As Stufflebeam and Shinkfield (1985) describe that, in the execution of a program, input evaluation is an assessment that identifies and analyses the elements that may obstruct or affect the implementation. It also examines the support mechanisms available both in terms of environment and facilities and human resources that facilitate effective implementation. In the context of this study, input evaluation encompasses the content of the course, learning outcomes of the course, extension agent's expertise and skills, as well as the equipment of learning facilities. Table 2.2 offers a breakdown of input and rate according to project types of the UAP.

The specific aspects evaluated include the range of resources provided through the DOA's extension activities, such as training support, incentive resources (equipment), extension services, exhibitions, and hands-on demonstrations aimed at participants of the UAP. The provision given by DOA (2022) includes:

1) Procurement for the development and enhancement of community agriculture projects, such as the construction or upgrading of infrastructure and project facilities. This includes agricultural inputs, small-scale agricultural machinery, construction

materials, irrigation systems and electrical wiring equipment, and machines and handling equipment throughout the food supply chain.

2) Technology transfer initiatives, which include:

a) Training packages, courses, workshops, and seminars.

b) Procurement of agricultural inputs, high-tech agricultural equipment, and machinery, as well as the development of innovations in urban agriculture.

c) Exhibitions and demonstration

d) Advisory services/technical visits

Table 2.2: Input and number of participants according to project category

Project	Subproject	Maximum Rate in Peninsular (RM)	Minimum number of participants
Individual	Edible Garden	500/participant	10
Community	Conventional Farm/Organic	500/participant	10
	Open Fertigation	10,000.00/group	10
School	Nutrient Film Technique (NFT) School Garden Mini Fertigation	10,000.00/school	50
Institution	Nutrient Film Technique (NFT) Institution Garden Mini Fertigation	10,000.00/institution	40

(Source: DOA, 2022)

The studies by Anderson and Feder (2007) and Davis et al. (2012) highlight how different input dimensions (funding, training, infrastructure) affect the success of agricultural extension programs. They found that effective management of these inputs leads to greater knowledge transfer, the adoption of new farming techniques, and improved agricultural productivity. Inputs like seeds, fertilizers, machinery, training in modern farming techniques, and infrastructure development (like irrigation systems) have been shown to be fundamental for program effectiveness (Harb et al., 2024). Kurnia et al. (2023) further supported this by demonstrating a direct correlation between well-allocated inputs with increased agricultural productivity, sustainable practices, and enhanced food security.

2.5.3 Process Dimension

The process component of the CIPP model is intended to explore how programs and procedures are managed and executed during the first three years (Morrison, 2005). Specifically, this dimension examines the operational framework that guides the realization of a program’s objectives (Yahaya et al., 2008). Regular assessment is imperative to track the program’s progress and ensure that it aligns with its established goals. As described by Stufflebeam and Shinkfield (1985), process evaluation is an appraisal of the procedures used to achieve a program's goals and objectives. For this study, process evaluation focuses on the implementation strategies adopted for technology transfer and the learning processes essential for achieving the objectives.

In implementing this UA program, the DOA provides services or extension activities to urban gardeners through technology transfer courses or training based on project technology, quality and effective advisory services to urban communities. A combination of theoretical instruction with hands-on learning experiences are also provided, as well as exhibitions to raise awareness of urban agriculture and cultivate interest in sustainable farming practices. To enhance the efficacy of the UAP, the DOA has adopted various approaches that include online knowledge-sharing sessions, face-to-face basic courses on urban agriculture, and interactive exhibitions. The integration of social media platforms dedicated to urban agriculture makes it easier for urban gardeners to access pertinent resources and updates. Table 2.3 summarizes the strategies used by the DOA in delivering its agricultural extension services for UAP.

Extension activities play a pivotal role in the success of agricultural development programs. According to Kurnia et al. (2023), farmers rely on extension workers for comprehensive support, including technical guidance, hands-on assistance, and effective management practices, provided with consistency and dedication. This need stems from the limited technological proficiency among many farmers, which necessitates continuous support to cultivate gradual mastery and confidence in new techniques (Indraningsih et al., 2023). Thus, the one key aspect that has received increasing attention is the role of the process dimension in the implementation of technology transfer strategies and its influence on the learning process, which ultimately shapes the achievement of program objectives (Jamil et al., 2023). For extension workers to deliver impactful outcomes, a diverse set of skills is essential. These include not only teaching skills and program planning, but also implementation proficiency, effective communication of information, evaluation programs, and managerial knowledge (Chikaire et al., 2018).

Table 2.3: DOA's strategy of agricultural extension services for the UAP

Agriculture Extension Activity	Description	Strategy
Training/Courses	Technology delivery based on project technology	 Physical/Virtual
Advisory Services	Quality and effective service to the urban community	 Physical/Virtual
Demonstration	Effective learning through theory and practice	 Physical/Virtual

Table 2.3: Continued

Exhibitions	A platform for promoting UAP in fostering interest in farming.	 Physical

(Source: DOA, 2022)

Research indicates that several factors in the technology transfer process, such as the type of knowledge being shared, the skills and capabilities of both the recipient and the supplier, and the quality of their working relationship, can greatly affect how effectively both tacit and explicit knowledge are transferred. These elements can also shape the recipient's learning experience and their ability to adapt and use the transferred technology in line with the program's intended goals. Azumah and Zakaria (2020) and Zimu et al. (2020) further highlight that the method of training, advisory services, and field demonstrations are the most apparent and successful mechanisms for technology dissemination. These mechanisms not only deliver practical knowledge but also reinforce the essential connection between theory and practice, enabling farmers to internalize and apply new skills effectively.

2.5.4 Product Dimension

Evaluating the product component of the CIPP model allows the researcher, as seen by the program design team and participants, to assess how effectively a program fulfills its intended outcomes, as perceived by both the design team and participants. This assessment, which is essential for gauging the success of management training initiatives, is rooted in the knowledge and skills gained by participants (Morrison, 2005). According to Yasin (2017), product evaluation of the program depends on the results of the program after it is completed. In this study, the evaluation of the product focuses on measuring participants' acquisition of knowledge, their skill development, and the extent to which they can apply these competencies. In the context of this study, the product dimension covered in terms of impact and transformations experienced by participants.

The evaluation extends to a broader assessment of community outcomes, which may include changes in attitudes, knowledge, skills, practices, and health. The impact and changes to the participants are two of the key factors that can influence the effectiveness of agricultural extension programs. In the context of agricultural extension, the product dimension can encompass factors such as the transfer of appropriate technology to farmers, the development of their technical and management capacities, and the overall improvement in agricultural productivity and rural or urban development (Jamil et al., 2023). Specifically, the development of appropriate technology and its effective transfer to farmers are essential to enabling participants to realize meaningful improvements. Assessing these impacts allows researchers and program stakeholders to gain deeper insights into program outcomes, leading to strategic enhancements that align the UAP more closely with its overarching objectives.

The effectiveness of a program is significantly influenced by the impact and changes experienced by its participants, as their level of engagement is a key factor in determining the success of the intervention (Horst et al., 2020). Meaningful engagement is defined as sufficient involvement in the program to achieve the desired outcomes which is more critical to success than merely increasing participation for its own sake (Ol et al., 1968). Engagement is closely tied to emotional, cognitive, and behavioral connections that reflect a participant’s interest in the program. As participants devote more time and effort, their commitment to the program grows. In this context, the product dimension of the CIPP model considers not only the achievement of a program’s intended outcomes but also any unintended ones that may emerge. A comprehensive assessment that provides a detailed understanding of the program’s overall effectiveness and highlights areas that may require improvement.

Overall, the CIPP evaluation model is an ideal framework for analyzing programs like the Urban Agriculture (UA) initiative, focusing on its background, inputs, processes, and outputs. The model is an iterative approach that helps improve the program by posing critical questions and exploring relevant concepts. The evaluation process, starting with an expert review and then all the way up to the DOA level, aims to identify problems and gaps in how the UAP is being implemented.

The context dimension of the CIPP model looks at the underlying issues and causes of changes that prompted the DOA to consider the need for the UAP. This test finds the good and bad points of the program's goals and learning results, providing essential context and justification for the program's existence. When it comes to the input dimension, the evaluation is mostly about the initiatives and tools that the DOA uses to create and run its programs. The analysis includes a thorough examination of course content, learning objectives, the expertise of extension agents, and the quality of learning facilities. Such an analysis provides valuable insights into the resources that either impede or facilitate the implementation of the UAP.

The process dimension shifts its focus to the operational aspects of the program; how the program is run and what the management is doing to make sure the goals of the program are met. It specifically looks at how technology transfer is put into action, how the students learn, and how the showcase spaces and tools are used. Lastly, the product dimension looks at the general outcomes of the UAP, such as how well participants learned new things and how they applied their learnings in practice. This holistic view provides a full picture of the program's effects, considering outcomes from the context, input, and process steps.

Using the CIPP model not only helps with the review process, but it also guides decision whether the outcomes suggest continuance, modification, or discontinuance. By using this analytical method, the study hopes to contribute critical insights into the effectiveness of the UAP under the DOA, highlighting areas ripe for improvement. The analysis is pioneering in its use of the CIPP model, particularly the application of an extended approach to evaluating goal attainment across multiple dimensions.

Although future evaluations might integrate alternative models, the novelty of this study lies in its approach of extending the CIPP framework, which has not been attempted before. In addition, the incorporation of an additional evaluative element termed "program effectiveness" serves to complement the existing CIPP structure to assess the overall success of the program.

2.6 Urban Agriculture Program (UAP) in Malaysia

The Urban Agriculture Division under the Department of Agriculture Malaysia was established on 1 November 2013 upon receiving instructions from the Prime Minister in 2012. The Urban Agriculture was launched on April 15, 2014, in Johor Bahru, by the then Minister of Agriculture and Agro-based Industry Y.B. Dato' Ismail Sabri Yaakob, followed by the subsequent launch at the Federal Territory of Putrajaya on May 8, 2014. The event reflects the government's proactive stance on urban food production and sustainability and as an essential component of national policy.

The Urban Agriculture (UA) program is implemented to support the National Agrofood Policy to ensure food security and reduce imports of agricultural products from foreign countries. Another focus of the program is to alleviate the financial pressures faced by urban populations. The Department of Agriculture (DOA) is tasked with overseeing and coordinating the implementation of the program and ensure that urban agricultural initiatives are well-integrated into the overall framework of urban development (Figure 2.3).

Figure 2.3: Transformation of Urban Agriculture Program
(Source: Department of Agriculture Malaysia, DOA)

Historically, Urban Agriculture initiatives in Malaysia started as the Green Book Project (Rancangan Buku Hijau), which later evolved into Green Earth Campaign (Kempen Bumi Hijau). It was introduced by the government under the Food Supply Security Policy in 2006 to bolster food self-sufficiency and ensure a reliable food supply chain. The primary goal of the Green Earth Program was to ease household expenses, particularly by promoting homegrown vegetable production. The Green Earth project focuses on urban and rural areas by encouraging residents to grow and raise small livestock, such as chickens and fish, for personal consumption.

The Bumi Hijau program ended in 2010 and was replaced by the Jom Bertani program, which was part of the Tenth Malaysia Plan (10MP) in 2014 and 2015. The central objective of the program remained consistent with its predecessor, which is to ease household expenses on buying vegetables. To support participants, the government provided one-time allocations that included agricultural inputs (NPK fertilizer and compost) and small-scale farming tools at the start of the program. However, the 11MP did not extend this funding as it shifted the responsibility to participants to continue the program using their own resources. The Department of Agriculture, however, maintained its role by providing technical advisory services to sustain community engagement and support.

In a further effort to embed urban agriculture among the Malaysian society, the Department of Agriculture introduced the Urban Agriculture Program (UAP) in 2014. It aims to empower urban communities to farm in order to produce their own food that could also serve as a supplementary income source. Between September 2014 to December 2016, the UAP engaged a total of 63,129 participants nationwide, which was supported by a RM10 million allocation, implemented across 2,715 project locations. The initiative involved various groups of participation, including individual households, community organizations, schools, as well as government and private institutions. One of the key approaches of UAP was the establishment of community gardens in shared open spaces, such as neighborhood parks and public parks, often coordinated through partnerships with local organizations like Partner Parks (RT). This strategy transformed underused spaces around the houses, offices, and communal areas into productive plots that can bring tangible benefits (Haliza, 2018).

The program is implemented individually or as a family, or in groups, communities or institutions. It is carried out with the guidance of the Department of Agriculture as well as the cooperation and involvement of various relevant departments and agencies at the state and federal levels, such as MPSJ, urban and rural development department (JPBD), Malaysian Agricultural Research and Development Institute (MARDI), and district or state municipalities. The Department of Agriculture as the main agency provides services, advice, and guidance to urban gardeners on suitable agricultural technologies to adopt, such as crop care, pest control, and disease management, in addition to providing incentives like seeds, fertilizers and small appliances.

2.6.1 Concept of Urban Agriculture Program (UAP)

The UAP is a program that assists urban households in lowering their living costs by self-producing certain essential fresh produce under the guidance of the Department of Agriculture. Residents in urban and suburban regions participate in this program and is supported by a network of key state and federal agencies. The integration of agriculture into urban planning and development is critical in cultivating sustainable development as it helps address several key urban challenges, such as ensuring reliable food supply, enhancing environmental quality through green spaces, optimizing water and waste management systems, while also providing educational opportunities and creating vibrant public spaces for leisure and recreation (Steenkamp et al., 2021).

Community urban agriculture is implemented on a voluntary basis. Since 2014, a total of 124,988 individuals across 5,065 localities have reaped its benefits (Rasmuna et al., 2022). A significant element of the program is the Community Urban Agriculture

Project (KEBUNITI). This initiative specifically targets individuals residing in urban and suburban regions. Specifically, KEBUNITI supports those belonging to the B40 income category, which is households with monthly earnings between RM1,900.00 (US$452.00) and RM4,849.00 (US$1,154.00), helping them manage food-related expenditures (Ministry of Finance, 2021). The UAP's focus on the B40 demographic highlights its commitment to addressing socioeconomic disparities. By empowering lower-income households with the means to produce their own food, UAP facilitates a reduction in reliance on purchased goods, directly alleviating financial strain. Moreover, excess produce can be sold, offering an opportunity for supplementary income generation.

The program's broader objective serves as a strategic approach to foster social contact within the local community (Hashim et al., 2020). The social aspect is essential, as community farming nurtures connection among participants, reinforcing a sense of belonging and collaborate effectively in groups to generate agricultural commodities for personal consumption or commercial purposes (Kennard & Bamford, 2020).

The expected outcomes of UAP by 2025 includes the production of 8,800 metric tons of safe agricultural products and a significant reduction in living costs from RM1,296.00 in 2021 to an estimated RM1,680.00 (Tiraieyari et al., 2019).

1) Projects and Activities of Urban Agriculture Program (UAP)

The projects are carried out at housing areas across individual households, community areas, and institutional spaces (Table 2.4). The specific activity within each category is described as follows:

1) High-tech agriculture involves the production of crop products using advanced technology such as sensors, solar energy, root environment modification and carbon dioxide enrichment. Applications include vertical farming, hydroponics, and smart greenhouse.
2) Institutional agriculture involves food production in office space, schools, and hospitals. It involves transforming underutilized open spaces, such as rooftops, open grounds, and building foyers.
3) Urban community agriculture such as Pisciponik (a symbiotic system combining crop cultivation and aquaculture), crop production in neglected areas and in areas designated for community use.

Table 2.4: Categorization of Urban Agriculture projects and sub-projects

No.	Project	Sub-project	Category
1.	Housing Area (Individual)	Edible Area	Individual in the community (minimum of 10 participants/local area)
		Mushrooms	Individual in the community (minimum of 10 participants/local area)
		Mini Fertigation	Individual in the community (minimum of 3 participants/local area)
2.	Housing Area (Community)	Conventional Farm/ Organic	Community (10 participants/group)
		Open Fertigation	Community (10 participants/group)
3.	Institution (Company/Private/ Office/School etc.)	Nutrient Film Technique (NFT)	Institution
		Edible garden	Institution
		Pisciponic	Institution
		Mini Fertigation	Institution

(Source: DOA, 2023)

2) The Scope of Urban Agriculture Program (UAP)

The scope of UAP encompasses several key criteria, such as following:

1) Program areas are implemented by residents in urban and suburban areas throughout Peninsular Malaysia, including the Federal Territories.
2) Cultivation areas are concentrated in areas such as residential spaces, institutional and office grounds, government reserve land (with proper written permission), idle land areas, and other suitable land determined by crop requirements.
3) In addition to technical advisory services, incentives can be considered as initial incentives. Incentives are in the form of seeds or planting materials, agricultural inputs, small agricultural equipment as well as land preparation assistance.
4) The State Department of Agriculture has the role of determining activity areas, category types and crops based on the suitability of the area.
5) The implementation is carried out with the cooperation of local authorities, relevant departments, and agencies.

The implementation of the program under those criteria is expected to yield the following outcomes: 1) help participants reduce project expenses; 2) maximize the use of open spaces around the house; 3) beautify the neighborhood's landscape; 4) arouse interest in farming and make farming as one beneficial hobby; and 5) helps ensure food safety.

The KEBUNITI 2.0 Program, which is overseen by the Ministry of Agriculture and Food Industry, has emerged as a crucial undertaking within the framework of the Food Security Policy (FSP), with a substantial budgetary commitment of RM30 million. The implementation of the program is also managed by the DOA, receiving a total funding of RM28.5 million. The responsibility for monitoring and evaluation has been handed to the Malaysian Agricultural Research and Development Institute (MARDI), with a budget of RM1.5 million. The program is rooted in the principles of sustainability and is designed to deliver economic, social, and environmental benefits to metropolitan communities. In the future, the program seeks to enhance extension operations, maintain consistent execution, encourage the active participation of non-governmental organizations and local government entities, and build strategic partnerships with governmental organizations and commercial enterprises (Tan et al., 2021).

Furthermore, the Policy of Urban Community Garden (Dasar Kebun Kebuniti Bandar or DKKB), which is led by the Ministry of Housing and Local Government (KPKT), serves as a complete framework for the advancement of sustainable urban community gardens. In accordance with national policy, the DKKB initiative prioritizes the cultivation of social integration, the advancement of sustainable practices, and the provision of accessible and high-quality food supplies for communities. The expected outcomes of the DKKB initiative include an increase in the number of sustainable urban community gardens, enhanced agricultural productivity, and increased participation in nationwide social integration projects (Tajuddin et al., 2019). The DKKB program serves as a demonstration of KPKT's dedication to establishing dynamic urban settings that prioritize the well-being of communities, the protection of the environment, and the promotion of local food supplies. This commitment aligns with the principles of green development as described in the 12th Malaysia Plan (Abdullah et al., 2022).

2.6.2 Challenges of UAP in Malaysia

Urban agriculture is emerging as a promising solution to address food security, environmental sustainability, and community development challenges in Malaysia. However, despite growing interest and increased funding, farmers in the city face various challenges including limited access to arable soil, inadequate capital, and restrictions on farming activities in urban areas. These challenges mirror broader issues identified in global urban agriculture, such as insufficient legal frameworks, the need to designate agricultural zones, limited civic education, and a lack of integration of urban agriculture policies into urban planning frameworks (University of Missouri, 2014). As such, the adoption and implementation of UAP in Malaysia face several significant obstacles.

One major challenge is the lack of awareness and understanding among urban residents about urban farming (Abas et al., 2020). Many Malaysians remain unfamiliar with the concept, its benefits, and how to set up and maintain an urban farm. This knowledge gap diminishes public interest and hinders their participation and adoption of such programs. Therefore, initiatives to educate urban communities on the value of urban agriculture, coupled with practical guidance on starting and managing urban farms, are essential. Moreover, because of certain limitations such as the lack of property rights, technical expertise, and reliable irrigation, deter urban dwellers from participating in urban farming activities (Haliza, 2018).

Another challenge is the difficulty in attracting and retaining volunteers for community-based urban agriculture initiatives (Ramalingam et al., 2018). Community garden programs, which are popular government-led efforts to promote urban farming, often struggle to maintain a consistent base of participants. The socio-economic and demographic characteristics of urban residents can influence their intention to remain involved as volunteers and understanding these factors is essential for designing effective strategies to encourage long-term volunteer engagement. Additionally, urban planning and policies in Malaysia have not always been conducive to the widespread adoption of urban agriculture (Rais et al., 2021). Urban spaces are often limited, and competition for land use can make it challenging to allocate sufficient space for urban farming (Shamsudin et al., 2014). Furthermore, the lack of clear regulations and support from local authorities can hinder the development and sustainability of urban agriculture projects. Addressing these policy gaps and integrating urban agriculture into broader urban planning agendas are essential for overcoming these barriers and promoting a thriving urban agricultural ecosystem.

The public sector's support for urban agriculture has largely been directed toward large-scale commercial farmers in urban city, overlooking small scale and informal operations. Moreover, many urban agriculture initiatives have struggled due to inadequate approaches to planning and delivery such as top-down and supply-led strategies. Other reasons of failure include inadequate and incomplete coordination with key stakeholders, political environment and ambiguous ownership concept (Islam & Siwar, 2012). Such issues may be defined and explored to a large degree through a study approach to UA's farming method and programs. For example, research on sustainable urban farming practices, success factors and constraints in Malaysia can provide insights on how to better design and implement UA programs (Nazuri et al., 2022).

Apart from that, agricultural development historically takes place in rural areas, where input constraints, particularly the available of arable land, pose significant challenges. Urban cultivation also has to contend with securing reliable sources of irrigation, navigating competition for residential and agricultural land, and concerns regarding potential hazards from agricultural inputs and outputs such as organic fertilizers, crop wastes, chemical residues and contaminants (Muhammad & Rashid, 2015). There is also the need to balance these challenges with limited space and water resources. This makes the selection of appropriate technologies that can optimize space utilization and water efficiency for urban farming practices even more imperative.

To address these challenges, a multifaceted approach is necessary. Increased public awareness campaigns, community outreach, and educational programs can help build interest and knowledge around urban farming. Collaboration between government, private sector, and community organizations can also help to identify and address the specific needs and barriers faced by urban farmers. Policies and urban planning that prioritize the integration of urban agriculture into the fabric of cities will be crucial for mainstreaming these practices. This effort could be done through proactive agricultural extension services, community-based approaches, and the development of supportive infrastructure and incentives. By addressing these challenges, Malaysia can unlock the full potential of urban agriculture to enhance food security, environmental sustainability, and community well-being.

2.7 Past Research on Urban Agriculture in Malaysia

The concept of urban agriculture incorporates a diverse range of activities, such as rooftop gardening, community gardens, urban farms, aquaponics, and other forms of horticulture conducted within urban settings. Specifically, it involves the cultivation of fresh produce such as vegetables, fruits, decorative plants, herbs, and fish (UPM, 2017). Additionally, the scope of this endeavor includes the generation of compost derived from organic waste in metropolitan areas, rainwater harvest, and the processing and selling of food products (Leelanayagi, 2018). In essence, urban agriculture encompasses the cultivation, processing, and distribution of agricultural and food products within urban areas, which is done through intensive planting practices, strategic animal husbandry, and purposeful landscaping (MARDI, 2017).

Urban agriculture (UA) plays a significant role in the improvement of food security through its contributions to local food production, the reduction of dependence on extensive supply chains, and the provision of fresh produce to urban people (De Bon et al., 2010). In addition, urban agriculture contributes to environmental sustainability through the utilization of unoccupied urban areas, resulting in a decrease in the carbon emissions linked to the transportation of food and the promotion of biodiversity within the local ecosystem (Warsame & Grafton, 2018). In addition to its environmental implications, urban agriculture facilitates community involvement by facilitating collective participation in the cultivation and production of food, enhancing social connections, facilitating educational opportunities, and cultivating a feeling of communal responsibility.

It can be argued that this practice fosters economic opportunities through its support of local marketplaces, which in turn, generates supplemental income for individuals and contributes to the overall growth of the local economy (Mougeot, 2005). The incorporation of agricultural practices into urban spaces not only serves to enhance visual appeal, but also yields the creation of green zones with positive influence on the broader urban environment and contributes to the promotion of mental well-being. Moreover, urban agriculture has various advantages in terms of health and nutritional contribution, waste management through composting, enhancing climate resilience by diversifying food sources, and providing chances for education and skill enhancement in sustainable agricultural methods and entrepreneurship (Bellows et al., 2003).

In recent years, there has been a growing interest in UA as a means to address the food needs of urban populations. This is a departure from the conventional perception of agriculture being confined to rural areas. Research conducted by Orsini et al. (2013) and Specht et al. (2014) has provided evidence indicating that UA, when implemented in a appropriate manner, has the potential to effectively meet the food needs of urban communities. Table 2.5 presents a compilation of research conducted in both developed and developing nations that underscore the significant roles of urban agriculture (UA) in enhancing the availability of fresh and nutritious food, facilitating direct access to a wide range of food items, reducing food expenses, and generating social advantages for communities (Fraser et al., 2011; Turner, 2011).

Table 2.5: Scenario of Urban Agriculture across the globe

	Contributions	References
Developed countries		
United States	UA improving public health (by providing access to produce and encouraging healthy eating), education, environmental improvement, the beneficial use of land, community development and job creation.	Cohen and Reynolds (2014)
New Zealand	Social interaction and community engagement through agricultural and relaxation activities.	Egli, Oliver and Tautolo (2016)
Australia	Income generation and reduce food expenditure through direct saving on food expenses and sale of food product.	McDougall, Kristiansen and Rader (2019)
Canada	Stability of food production for household consumption, social interaction and community engagement.	Duchemin, Wegmuller, and Legault (2008)
Japan	UA promoting food security and accessibility to food.	Hara, Yoshii, Tsujimura and Sampei (2016) Kimura and Nishiyama, (2008)
Developing countries		
Zimbabwe	Income generation and food expenditure reduction through direct savings on food expenses and product sales.	Kutiwa, Boon and Devuyst (2010)
Indonesia	UA played an important role for urban sustainability, providing income opportunities, delivering food and fibre.	Rondhi, Pratiwi, Handini, Sunartomo and Budiman (2018)
China	Urban communities also have an opportunity to generate income through the production of the downstream product.	Ding, Liu and Ravenscroft (2018)
Malaysia	UA contributes to social development and environmental sustainability in the form of recycling of nutrients, community development, food security, opportunities for leadership development, job opportunities that generate income, and contributing to the social safety net for poor populations.	Tajuddin, Sum, Zainol, and Jusoh (2019) Rezai, Shamsudin, and Mohamed (2016) Ramaloo, Liong, Siwar, and Isahak (2018) Ghazali (2013) Othman et al. (2017)

(Source: Nazuri et al., 2021)

UA holds significant importance in addressing the challenges of food insecurity and urban poverty, mostly impacting the urban poor population who face difficulties in meeting their fundamental needs (Kutiwa et al., 2010; Stewart et al., 2013; Zezza & Tasciotti, 2010). The discrepancy in costs between formal and informal food supply systems has been the driving force for individuals in urban poverty to participate in urban agriculture (UA) to achieve self-sufficiency and potentially generate additional revenue (Kutiwa et al., 2010; Othman et al., 2017). The direct availability of fresh food in urban areas means that family food security is guaranteed, which may address malnutritional issue among urban people. This aspect has garnered substantial recognition and endorsement from policymakers, government organizations, and scholars worldwide (Rezai et al., 2016).

In addition to its economic advantages, urban agriculture serves as a social development endeavor, promoting the establishment of community ties, close interpersonal connections, and a sense of solidarity among those involved (Duchemin et al., 2008; Egli et al., 2016; Ghazali, 2013). The various contributions of urban agriculture (UA) render it a sustainable practice that effectively tackles food crises, enhances food security, boosts household income, and fosters stronger community relationships (Othman et al., 2019; Tajuddin et al., 2019; Yusoff et al., 2017). Urban agriculture (UA) is widely acknowledged on a global scale, including in Malaysia, as a viable approach to combat food insecurity and urban poverty. Indeed, it is an informal system for producing and supplying food within urban areas, and it aligns with resilience theory to effectively tackle the problems posed by the food issue (Othman et al., 2019).

The body of research on urban agriculture (UA) presents a broad spectrum of perspectives and insights, underscoring the numerous benefits, values, as well as challenges associated with participatory practices, community empowerment, public perception, and the dissemination of knowledge among urban farmers. To date, numerous studies have emerged examining at the different factors influencing involvement and perceptions of UA across various settings, particularly in Malaysia.

Nazuri et al. (2021) carried out a quantitative study involving 212 participants of the UAP within the Klang Valley region. This study highlights the importance of social capital and participant engagement in empowering communities, suggesting that active involvement is key to building social cohesion and enhancing empowerment through UA initiatives. Similarly, Leelanayagi (2018) investigated volunteer intentions in community garden programs, demonstrating that continued volunteer engagement is crucial for the long-term sustainability of these programs. The study, based on a survey of 390 volunteers, emphasizes the importance of understanding motivational factors to maintain volunteer participation over time.

Ibrahim (2018) further contributed to this discourse by exploring the factors that shape urban residents' intentions to participate in UA, drawing on data from 1,365 respondents. The study identified several critical determinants, including perceived interest, behavioral regulation, enabling conditions, social norms, attitudes, and perceived risk. These findings highlight the complex interplay of social, psychological, and contextual factors influencing urban residents' decisions to engage in UA, and the role of social networks and media in promoting favorable attitudes toward urban gardening.

Hussain et al. (2019) added to this analysis by examining the perceptions among urban residents of UA among 200 individuals in Shah Alam, Kuala Lumpur, and Putrajaya. The study found a generally positive attitude toward UA, with 61% of respondents agreeing that it lowers household costs by reducing spending on fruits, vegetables, and flowers. This finding suggests that economic benefits, alongside community participation, are significant factors in the perceived effectiveness and sustainability of urban farming practices.

In contrast to these quantitative studies, Ramaloo et al. (2018) used a qualitative approach to examine the impact of community farming on urban households in Taman Desa Damai, Penang. Through interviews and observations, the study highlighted the vital role of community agriculture in enhancing food security, improving dietary quality, and fostering a sustainable urban environment. It advocated for increased financial support and resource access, proposing that strategic investment in community farming could play a crucial role in addressing future food security challenges and encouraging a shift in urban attitudes towards sustainability.

Rezai et al. (2016) also conducted a quantitative analysis of 360 households in Putrajaya, showing a strong link between engagement in UA and improved food security. The results suggested that UA contributes to adequate nutrition, affordable food supplies, and reduced food costs, underscoring the need for local governments to acknowledge and support UA initiatives. The study noted that higher-income, younger age group, and more educated urban residents are more likely to connect UA with food security, indicating that targeted support could enhance participation.

Overall, these studies demonstrate the complex nature of urban agriculture, highlighting its potential to empower communities, promote sustainable practices, and address food security concerns. However, they also suggest the need for a more integrated and comprehensive approach such as targeted evaluation studies to effectively inform future policies and interventions. By combining quantitative and qualitative insights, future research can better navigate the complexities of UA and support more inclusive and sustainable urban food systems.

Nevertheless, although significant research has been undertaken to provide an overview of urban agriculture as a promising field for Malaysian city residents, a specific focus of research is needed to analyze the UAP managed by the DOA. Therefore, this study seeks to address the gap by evaluating the program's structure and implementation, with the intention that it will contribute to the development of the UAP in the future. This is also to ensure that it aligns with the contexts, priorities and objectives through optimal allocation of resources and efficient processes, which should lead to impactful outcomes.

2.8 Past Research on Program Evaluation based on CIPP Model

Evaluation is regarded as an essential professional assessment that valuable insights for informed decision-making and effective policy implementation. Schwandt (2008) argues that evaluators play a crucial role in cultivating "critical intelligence," while Henry and Julnes (2000) highlight its value in enhancing our capacity to assess policies and programs effectively. Patton (1997) identifies three main purposes for evaluation: assessing merit, improving programs, and generating knowledge. Chelimsky (1997,

2006) expands on these purposes, outlining the evaluation's role in supporting policymaking, fostering program improvement, and contributing to knowledge development. One of the most prominent frameworks used to evaluate a program is Stufflebeam's (1983) CIPP model. The Context, Input, Process, and Product is a comprehensive framework that evaluates various aspects of a program, from its initial design to its outcomes. Several studies illustrate the application of the CIPP Model in program evaluation.

Gurning et al. (2019) applied the CIPP model to evaluate the performance of Agribusiness Microfinance Institutions (MFIA) in Gunungkidul, Yogyakarta, Indonesia. The study found that the MFIA met "good" performance criteria, demonstrating the CIPP model's effectiveness in identifying areas for improvement and enhancing program success. The findings suggest that while the MFIA plays a crucial role in providing agricultural capital in rural areas, its long-term success depends on aligning stakeholders' understanding and efforts toward continuous improvement.

Man (2010) used the CIPP model to assess the effectiveness of the Women Economic Development (WEDA) program in Sarikei, Sarawak, which aimed to promote women's entrepreneurship. The study found significant improvements in participants' knowledge, skills, confidence, business growth, and attitudes toward success. However, it also identified operational and promotional costs as major challenges, underscoring the need for targeted support to enhance program outcomes.

DeHegedus (1994) conducted a case study using the CIPP model to evaluate agricultural development programs in Uruguay. The study combined qualitative methods, such as surveys and interviews, to examine a sample of agricultural extension projects. The findings highlighted the CIPP model's utility in ensuring that critical elements impacting project implementation are not overlooked. The study also identified guidelines for future agricultural extension initiatives, emphasizing the need for capacity-building components and improved strategic planning from a human resource development perspective.

Ishak et al. (2017) further supported the use of the CIPP model in evaluating the My Kampung My Future (MKMF) program. The study aimed to assess the program's effectiveness in reducing youth unemployment and increasing youth participation in the agricultural sector. The findings suggest that the CIPP model provides a valuable framework for ongoing evaluation and continuous improvement, helping to ensure the program's effectiveness and adaptability to future needs.

In a study involving a global corporation, To (2017) evaluated an apprenticeship program at Siemens Energy, Inc. using the CIPP model, combining quantitative and qualitative methods. The study found that the program met its objectives but recommended increasing resources for apprentices, clarifying program criteria, and developing a strategic plan to enhance its effectiveness.

In another global study on educational program, Chen (2009) applied the CIPP model in a case study evaluating English training courses in Taiwan. The findings highlighted the model's effectiveness in providing actionable insights to educational decision-makers, enabling them to identify areas for improvement and expansion in the Applied English Department. The study concluded that the CIPP model serves as a constructive tool for enhancing educational programs, rather than limiting or closing existing services.

Aziz et al. (2018) applied the CIPP model to assess educational quality in the Rawalpindi Welfare School System. The study found that while there were efforts to enhance education through advanced technology and teaching strategies, challenges such as an overemphasis on rote learning and inadequate facilities were evident. The findings suggest that the CIPP model can serve as a valuable tool for systematic evaluation and improvement of educational quality at the school level.

Johnson (2018) employed the CIPP model to evaluate the Multi-Tiered System of Support (MTSS) in Pamlico County School, using a mixed-methods approach. The study identified several challenges, including inconsistent leadership, insufficient staff training, and high staff turnover. The evaluation led to recommendations for developing a clear district vision, providing adequate training, and ensuring consistent staffing to improve program effectiveness.

Maksum et al. (2019) used the CIPP model and Analytical Hierarchy Process (AHP) to evaluate the career development programs for Indonesian Navy Civilian Personnel. The study identified strengths and areas for improvement, with most aspects of the program rated highly. However, it also recommended updates to certain elements to ensure continued effectiveness in career development.

Razak (2019) evaluated an entrepreneur development training program in Selangor, Malaysia, from an Islamic perspective, using the CIPP model to assess its overall effectiveness. Meanwhile, Yasin (2017) developed a framework for improving the implementation of the Polytechnic Mechatronic Engineering Diploma programs in Malaysia, based on the CIPP model. The findings led to the creation of a framework to optimize program delivery and outcomes.

Building on these studies, this research aims to refine the conceptual framework by integrating the insights from Ishak (2019), Yasin (2017), and Razak (2019), incorporating program effectiveness as an additional dimension in the CIPP model. This approach seeks to ensure that all aspects of the UAP by DOA are effectively evaluated, supporting the achievement of its objectives through meaningful inputs, efficient processes, and productive outcomes.

2.9 Past Research on Data Analysis Method

In any research project, data analysis is an essential component that helps achieve the study's goals by methodically investigating potential solutions to the questions that have been posed. Preliminary analysis approaches are utilized in certain research to detect outliers and guarantee a normal distribution of data. In their data preparation processes, Leelayanagi (2018), Wong and Foo (2011), and Shing (2011) all included the evaluation of skewness and kurtosis. As a necessary step before beginning data analysis, Sharidatul (2020), Vinayagan (2021), Bachman (2014), and Herman et al. (2013) strongly emphasized the importance of cleaning the data. To further enhance data quality, Al Mutawa (2015) and Sharidatul (2020) examined the skewness and kurtosis of their data to determine whether they were normal, using the Mahalanobis distance to spot outliers.

Descriptive analysis is a fundamental data analysis technique essential for understanding and interpreting data. It does so by transforming raw data into a comprehensible format. Researchers commonly employ descriptive analysis, utilizing measures such as frequencies, percentages, means, and standard deviations to explore and summarize collected data. Notable examples include studies conducted by Sihvola et al. (2023), Kataoka et al. (2023), Wang et al. (2021), Maya et al. (2021), Nazuri (2021), Leelayanagi (2018), Ida (2017), Ishak (2019), Dalinna (2018), Razak (2019), where descriptive analysis was employed to enhance the presentation and interpretation of their research findings.

Advanced analytical techniques, such as Structural Equation Modeling (SEM), are important for testing hypotheses and evaluating models. Ishak (2019) employed SEM to assess hypotheses and the proposed model regarding the effectiveness of implementing My Kampung My Future (MKMF) in Malaysia, based on the CIPP Model. Additionally, Fah and Sirisena (2014) utilized SEM to investigate the interplay among knowledge, attitudes, and behavior in environmental literacy, contributing valuable models for identifying environmental care in high schools.

Furthermore, Khoi and Van Tuan (2018) employed SEM analysis in their telecommunications context studies, revealing models that establish a connection between consumer satisfaction and loyalty. Notably, Ramayah et al. (2017) conducted SEM analysis to scrutinize the model of Facebook social site usage, while Azadeh and

Nordin (2015) explored factors influencing the teaching of international students engaged in postgraduate studies, incorporating SEM analysis to formulate models encompassing psychological and sociocultural factors that impact cross-cultural dynamics.

Qualitative analysis, which is often used to supplement quantitative findings, has also been used in evaluation studies that use the CIPP model. Researchers such as Razak (2018), Ishak (2019), and Yasin (2017) adopted qualitative approach in their program evaluation studies, complemented with semi-structured interviews with respondents to gain deeper insights. Noraini (2010) pointed out that a qualitative report or analysis does not have a set methodology; rather, it is dependent on the information or findings that the researcher gathers.

The current study adopts a comprehensive approach to data analysis, incorporating preliminary analysis, descriptive analysis, structural equation modeling, and qualitative analysis. These techniques are widely employed in previous research and are employed to accomplish the study's goal.

2.10 Theoretical, Research and Practice Gaps

A review of the literature reveals a breadth of research on the scope of urban agriculture. However, there remain significant theoretical, research, and practical gaps unaddressed. From a theoretical perspective, many theories and models of evaluation have been applied in program evaluation to assess the effectiveness of educational programs. However, their applicability to agricultural extension programs has been largely overlooked. Furthermore, even though the CIPP model has been tested across various agricultural domains, its application to UAP management remains underexplored. Moreover, studies focusing on the utilization of the CIPP Evaluation Model on extension agricultural program, particularly those under the purview of the DOA, are scant.

In terms of research gaps, the urban agriculture sector has been the subject of numerous studies emphasizing its importance. However, evaluations of UAP have been neglected. Another gap emerges in the context of extension service programs, which have not been rigorously examined through the lens of program evaluation. Previous research has only considered the impact of the program using a limited set of variables rather than employing a holistic evaluative approach. This gap emphasizes the need for comprehensive evaluation methods that examine programs through the dimensions of **Context, Input, Process, Product** and **Effectiveness** of overall program, particularly from the perspective of UAP participants. It is important to note that an improvement framework of program evaluation is developed and refined over time as new evidence becomes available.

Several studies on agriculture have demonstrated the utility of CIPP as an effective assessment methodology for enhancing and supporting program decision-making. However, notable methodological and practical gaps exist, particularly concerning rigor in evaluating the CIPP model itself. Although the CIPP model has been employed in various domains, including community enterprise, women's entrepreneurship, integrated farming of cattle and oil palm plantations, and extension agent performance evaluation, research on UAP evaluation remains scarce. Specifically, there is a dearth of evaluation studies addressing Malaysian UAP, which reveals a critical gap in understanding and assessing these programs. Significant issues with Malaysian urban agriculture practices have been noted, including the lack of a thorough review of the overall efficacy of the program. These gaps highlight the need for more rigorous and systematic evaluation frameworks to assess the sustainability and impact of UAP in Malaysia.

A comprehensive framework for understanding program performance must consider the underlying program theory. Program theory defines the problem a program aims to address, identifies the target population, and elucidates the causal processes by which the program is expected to generate the desired outcomes. Incorporating this theoretical foundation is essential to evaluating why a program has been successful or unsuccessful. Thus, researchers must carefully examine program theory to identify the key variables and elucidate the relationships that influence program effectiveness.

2.11 Summary

This chapter examined key literature on evaluation concepts and definitions, with a specific focus on the evaluation of urban agricultural programs (UAP) in Malaysia and the use of the CIPP evaluation model. The CIPP model was presented as a foundational framework, highlighting its relevance and applicability in assessing various dimensions of program evaluation. To illustrate this, the chapter explored studies that utilized the CIPP model to evaluate such programs in Malaysia. Each element of the model—Context, Input, Process, and Product—was examined in detail to provide a structured perspective on its implementation in previous research. The chapter also discussed the methodologies adopted in these studies, offering insights into their approaches and techniques. By analyzing these studies, the chapter identified theoretical, research, and practice gaps that will be addressed in the subsequent chapter.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter delved into the methodological underpinnings of the study, including the research design, conceptual framework, sampling strategy, instrument development, pilot study, and procedure analysis of data. The research aimed to evaluate the implementation of the UAP under the DOA across various states in Peninsular Malaysia according to different zones. To achieve this, the study employed Stufflebeam's (2000) evaluation model that assesses the dimensions of context, input, process, and improvement-oriented products to inform decision-making processes.

3.2 Research Design

The research design serves as a fundamental pillar of the study's framework. This study employs a survey design approach using a questionnaire and semi-structured interviews. A quantitative questionnaire was used to collect data supplemented by semi-structured interviews to provide qualitative insights. Table 3.1 briefly describes the research design adopted for this study.

Table 3.1: Research design

Research Design	Data Collection Method	Respondent/Sample	Type of data
Descriptive/ Inferential Research	Survey and Semi structured Interview	UAP Community Garden Participants	Quantitative and Qualitative as supporting document

3.2.1 Phase 1: Preliminary Study

The first phase of the study established the scope and direction by addressing key issues identified through a review and analysis of previous studies conducted both locally and internationally. An initial survey was carried out to identify the issues and problems encountered in the agricultural sector and UAP. The purpose and objectives of the study are then established to determine the study's direction. In this phase, the qualitative approach was adopted to obtain information through document analysis and semi-structured interviews with agriculture departments (stakeholders) and UAP participants. The document analysis focused on deriving essential dimensions for evaluating the implementation of UAP.

3.2.2 Phase 2: Instrument Development and Pilot Study

In this phase, the development of research instrument was guided by the dimensions and elements identified earlier. Before conducting the pilot study, it was subjected to expert review and validation. A pilot study was then conducted to further refine the instrument, where data and the findings of the pilot study were analyzed using SPSS software. The use of SPSS software in a study facilitates data processing to generate reliable and valid measurements that can be used to enhance the quality of the instrument (Pallant, 2020).

3.2.3 Phase 3: Real Study

The third phase involved the comprehensive evaluation of program elements through questionnaires based on Context, Input, Process and Product and Effectiveness dimensions, with aim of developing a framework for the improvement of UAP. Data obtained through interviews with DOA and participants of UAP were used to corroborate the variables identified earlier before collecting data through quantitative methods. Figure 3.1 illustrates the flow of data collection process for this study, which was divided into three phases. Data collection in the third phase involved: 1) semi-structured interviews with DOA (stakeholders); 2) distribution of questionnaires to program participants, and iii) document analysis (checklist) by the program's director. The use of questionnaires was further justified according to Konting (2009), which is to obtain more consistent responses. Data collected at this stage were subjected to analysis using SPSS software.

3.3 Conceptual Framework

Based on the literature, a research framework was constructed to guide the data collection. The widely recognized CIPP model, developed by Stufflebeam, served as the framework for this evaluation study. As a cornerstone of program evaluation theory and practice, this model is particularly well-suited for addressing the gap between theoretical constructs and practical implementation. Therefore, the CIPP was used to assess the actual practices observed in in-place and completed program evaluations. Figure 3.2 illustrates the conceptual framework of this study.

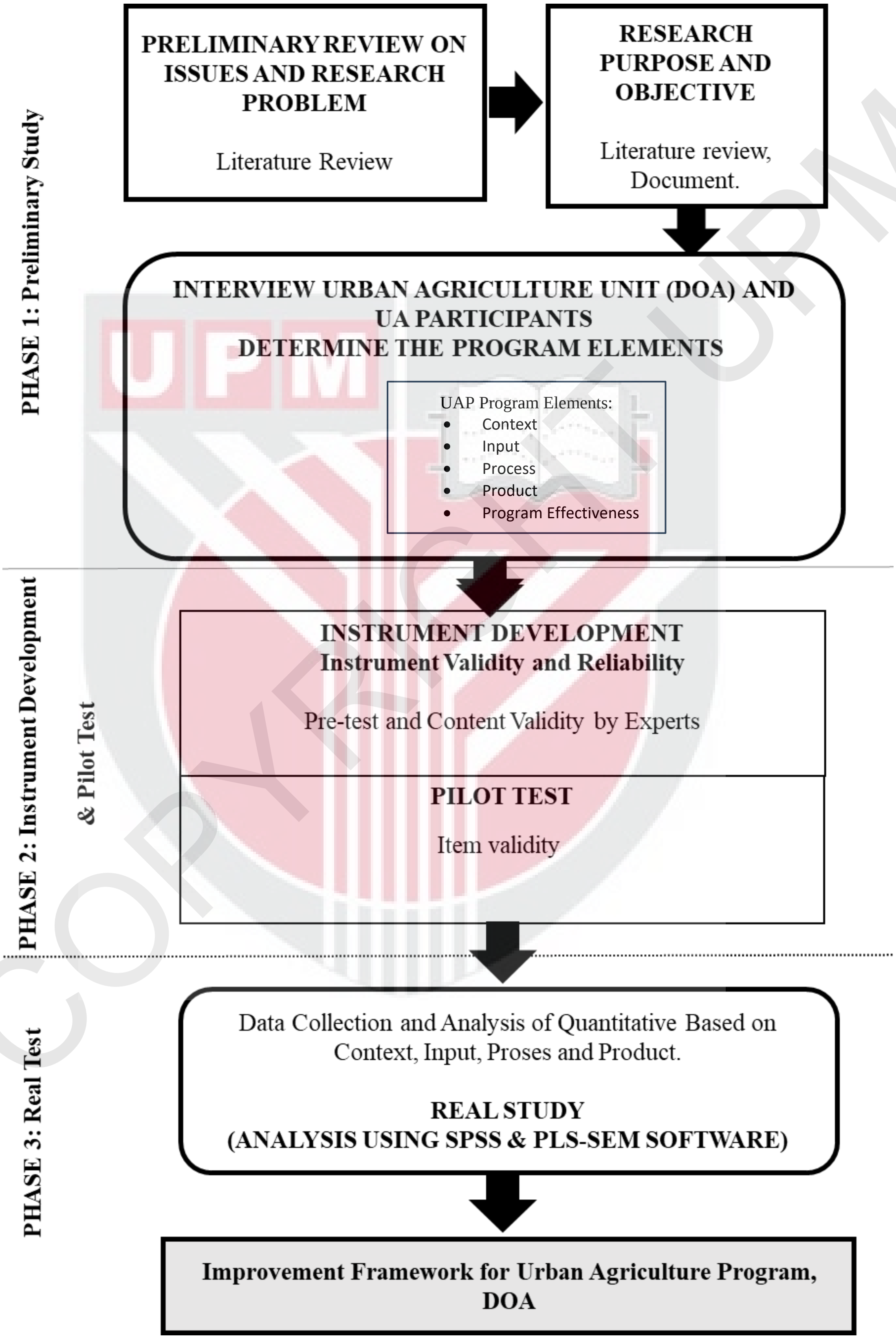


Figure 3.1: Research Design and Operational Flow

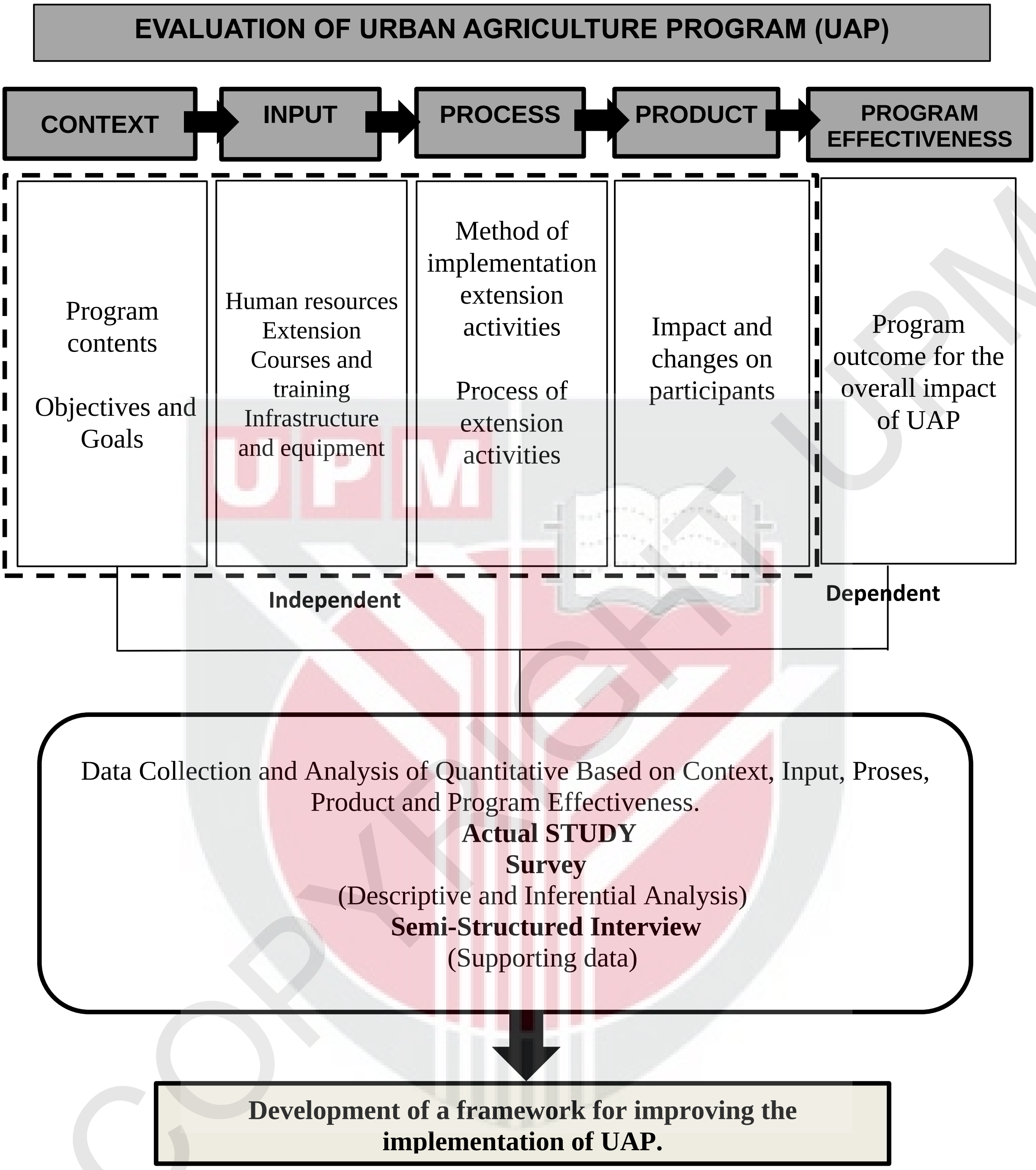


Figure 3.2: Conceptual Framework of Urban Agriculture Program Implementation
Adapted from Stufflebeam (1983) and modified from Razak (2018), Ishak (2019), Yasin (2017), Allen (2006), Laukaitis (2016), and Nugroho et al. (2020).

In this study, the independent variables (IV) are delineated as follows: a) **Context**, which examines the relevance of the program's content, objectives, and goals; b) **Input** encompasses human resources (such as extension agents), training courses, infrastructure, and equipment provided; c) **Process**, involving the methods and implementation of extension activities, and d) **Product**, representing the outcome that influences program participants. These independent variables are responsible for driving the change in a particular phenomenon. The dependent variable (DV), on the other hand, is **Program Effectiveness**, which measures the impact resulting from the context, input, process, and product. In this study, Program Effectiveness refers to the overall outcome and impact of the UAP.

Stufflebeam's CIPP Evaluation Model (1983) delineates an evaluation process into four dimensions: Context, Input, Process, and Product. The first dimension is **Context Evaluation,** which examines whether the program's content aligned with its stated objectives. This alignment is essential for determining whether the UAP meets its intended goals. The primary goal of the UAP is to help alleviate participants' cost of living. The program also aims to simultaneously promote community farming initiatives that yield sufficient, high-quality, and safe food production, as well as to foster social interaction and communication within the community.

The second dimension, **Input Evaluation**, focuses on the variety of incentives and resources provided by the Department of Agriculture (DOA) to program participants. These include the quality of course materials, practical training, and physical resources such as equipment, extension services, exhibitions, and demonstrations conducted during UAP activities. By assessing these provisions, the model evaluates the program’s capacity to address participant needs comprehensively.

The **Process Evaluation** dimension assesses the methods and processes employed during the UAP implementation. This involves scrutinizing the implementation process and identifying issues that may have hindered the smooth execution of the program. The fourth is the **Product Evaluation** dimension, which assesses the changes and impacts on participants, such as their knowledge, skills, attitudes, health, and environment.

Finally, the **Program Effectiveness Evaluation** dimension evaluates the overall outcomes of the UAP. This dimension was adapted and modified based on previous evaluation studies by Allen (2006), Laukaitis (2016), and Nugroho et al. (2020). It assesses the program’s achievements in terms of urban community empowerment through sustainable agriculture and food security.

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The selection of UAP for evaluation responded to the government's call for increased domestic food production, aiming to secure a sustainable supply of nutritious and safe food while reducing dependency on imported goods. Given the substantial investments in UAP, expectations for significant economic returns and widespread societal benefits are naturally high. Hence, the evaluation of UAP's effectiveness is based on the CIPP model.

The CIPP Model was selected as an evaluation indicator for UAP due to its comprehensive nature, which aligns with Stufflebeam's (1984) vision of using evaluation to inform decision-making. More importantly, it is the model's approach of prioritizing improvement over criticism with the aim to provide support rather than merely exposing program weaknesses.

A distinct advantage of the CIPP model is the flexibility it offers to evaluators to conduct assessments before, during, or after program implementation. It enables researchers to either focus on all dimensions, a single specific dimension, or extend the scope of analysis as needed. The findings also help evaluators make unbiased decisions to guide relevant stakeholders. At the conclusion of the evaluation, researchers can determine whether the program should continue, be modified, improved, or discontinued. This iterative improvement approach ensures that the program remains viable and aligned with long-term goals.

In this study, a quantitative approach using a survey method was adopted, with questionnaires as the primary data collection instrument and semi-structured interviews as supporting data to reinforce the findings. After data collection, the researcher analyzed the data using SPSS software for descriptive data. **Smart Partial Least Square (SMART-PLS)** software was used for analyzing inferential data due to identify the relationship between exogenous and endogenous dimensions and to develop a framework for improving UAP implementation.

3.4 Population and Sample Size

A population refers to a group of individuals who share at least one common trait or characteristic (Konting, 2009). Before embarking on a study, it is important to first identify both the population and sample for the research. This study identified participants of the UAP initiative under the purview of the DOA across four states in Peninsular Malaysia categorized by geographical zones. Data on the total number of UAP participants were obtained directly from the DOA.

The actual population of the study consisted of 507 community garden participants. A cluster sampling method was employed, resulting in a total of 242 participants involved in community gardens in Georgetown, Penang (Northern region), Kuala Lumpur (Central), Kuala Terengganu, Terengganu (East Coast), and Johor Bahru (Southern). All sampled participants were actively involved in the UAP initiative in Peninsular Malaysia.

Ishak (2017) emphasized that selecting a subset of respondents from the population is essential to ensure the sample accurately reflects the group under study. Accordingly, the table for sample size determination by Krejcie and Morgan (1970) was used as a reference for determining the appropriate sample size in this study (Table 3.2). The key objective behind using this sampling tool was to ensure that the sample size is proportionate to the population being examined.

Table 3.2: Sample size determination table

N	n	N	n	N	n
10	10	110	86	300	169
15	14	120	92	320	175
20	19	130	97	340	181
25	24	140	103	360	186
30	28	150	108	380	191
35	32	160	113	400	196
40	36	170	118	420	201
45	40	180	123	440	205
50	44	190	127	460	210
55	48	200	132	480	214
60	52	210	136	500	217
65	56	220	140	550	226
70	59	230	144	600	234
75	63	240	148	650	242
80	66	250	152	700	248
85	70	260	155	750	254
90	73	270	159	800	260
95	76	280	162	850	265
100	80	290	165	900	269

(Source: Adapted from Krejcie and Morgan, 1970)

The Raosoft Sample Size Calculator (http://www.raosoft.com/samplesize.html) was also used as a complementary tool to refine the determination of the sample size and to ensure greater precision. This calculator is widely regarded for its effectiveness and reliability in identifying the optimal sample size for research purposes. Using it helps researchers achieve the balance that avoids the risks of under-sampling, which can distort results, and over-sampling, which can lead to wasted resources.

The tool takes into account essential factors such as margin of error, confidence level, population size, and response distribution, thus ensuring that the sample size is scientifically justified and enhances the accuracy and representativeness of the study. As noted by Chow et al. (2008), selecting the appropriate sample size is vital for achieving adequate statistical power and minimizing the chances of errors. The Raosoft calculator streamlines this process, making it more accessible, even for those without advanced knowledge of statistics.

The calculation by Raosoft software resulted in 219 participants as the target sample size for this study (Figure 3.3). Table 3.3 outlines the four selected locations involved in the UAP program for this research. In Penang, 75 participants were included in the study, while Kuala Lumpur contributed 64. Meanwhile, Terengganu and Johor had 30 and 50 participants, respectively. This brings the total number of samples involved in the UAP study to 219, as initially proposed.

Table 3.3: Total population and sample by states in 2021

States	Total Population	Total Sample
Penang (Georgetown)	175	75
Kuala Lumpur (KL)	148	64
Terengganu (Kuala Terengganu)	70	30
Johor (Johor Bahru)	114	50
Total	**507**	**219**

(Source: DOA, 2021)

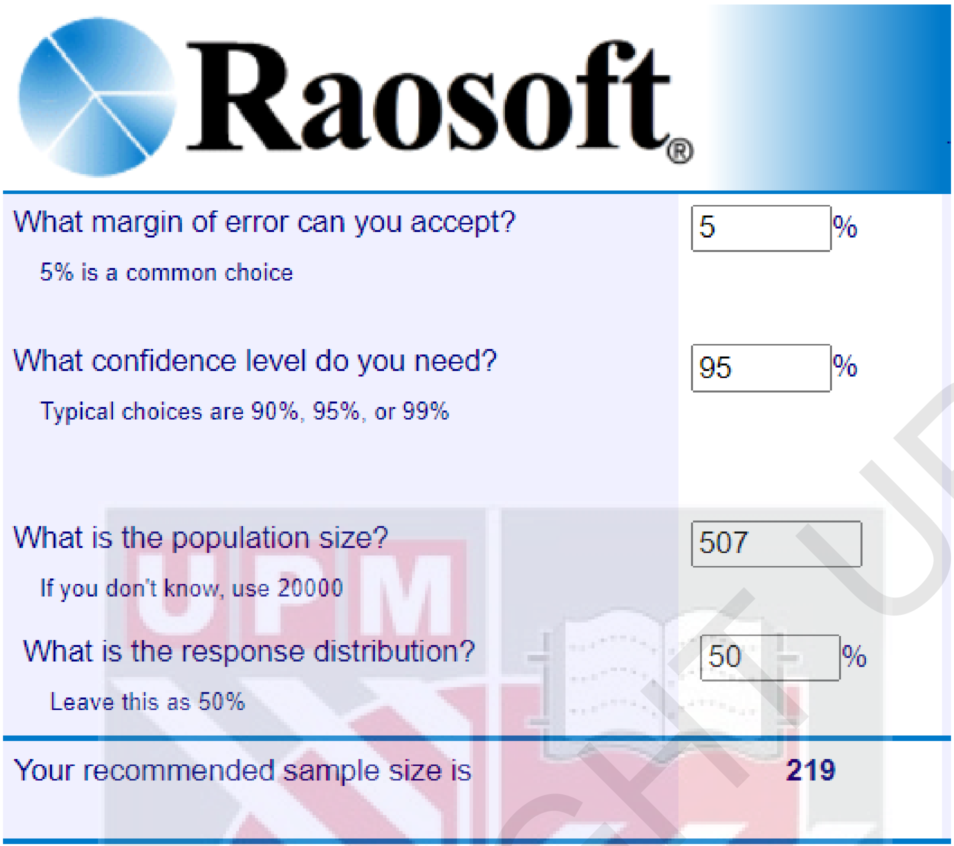

Figure 3.3: Raosoft sample size calculator

In this study, questionnaires were distributed among 250 community garden participants, which was considered adequate to represent the population of this study. This figure is further supported by Chou (2000), who considered 200 as the minimum sample size acceptable for SEM analysis.

In total, 242 usable responses were received out of 250 questionnaires. Hence, the response rate for this research is 97%. Based on the calculation depicted in Figure 3.3, the minimum recommended sample size of researcher survey is 219 with a confidence level of 95%. If the researcher achieves a sample of this magnitude, with responses from everyone, the researcher is likely to obtain greater precision compared to a large sample but with low response rates. Nonetheless, after the data cleaning process, only

230 samples were deemed suitable for further analysis. Table 3.4 summarizes the sample sizes of the present study acquired for different phases of data collection from pre-test to data cleaning process. In addition, qualitative data was also collected to as supporting findings through semi-structured interviews with nine community garden leaders who are actively involved in UAP (Table 3.5).

Table 3.4: Sample sizes across various phases of data collection

Respondent	Pre-test (n)	Pilot Study (n)	Minimum Sample size (n)	Sample Distributed (n)	Sample Collected	Data Cleaning (n)
Community garden participants	6	36	219	250	242	230
Total			**219**	**250**	**242**	**230**

Table 3.5: Profiles of community garden leaders in selected states in Peninsular Malaysia

Name	Community Garden
Informant 1	Kebun Bandar Tun Razak, Kuala Lumpur
Informant 2	Kebun Setapak, Kuala Lumpur
Informant 3	Kebun Gong Penaga, Kuala Terengganu
Informant 4	Kebun Jln Bachang, Johor Bahru
Informant 5	Kebun Jln Duku, Johor Bahru
Informant 6	Kebun Kg Baghol Kemang Tiruk, Kuala Terengganu
Informant 7	Kebun PPR Padang Hiliran, Kuala Terengganu
Informant 8	Kebun Taman Sepadu, Penang
Informant 9	Kebun PAWE, Penang.

3.5 Data Collection Procedure

The first stage of data collection involved interviewing, i.e., semi-structured, with stakeholders and participants to obtain data and insights on the ground situation of UAP. Figure 3.4 presents an overview of data collection for this study. Initially, approval was sought from the Head Director of the Department of Agriculture (DOA), Malaysia. Subsequently, explicit permission was secured from the Director of the DOA directly involved in the study. A preliminary study was conducted to establish foundational insights, followed by a qualitative approach that included document analysis and literature review to gather data. Interview sessions with stakeholders were then conducted to review and validate the obtained information. The reliability of the analysis was ensured through collaboration with experts. A pilot study was carried out after the development of research instruments. Following the formalization of the questionnaire, the main phase of data collection was then carried out, culminating in the development of a model framework that synthesizes both qualitative and quantitative findings.

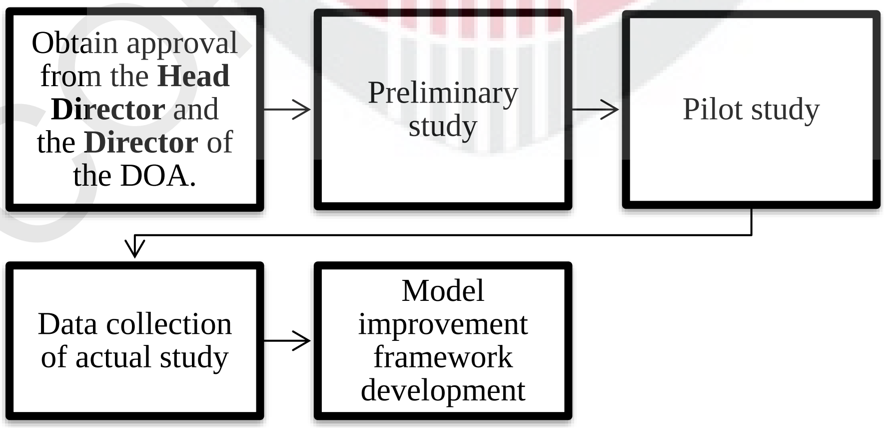

Figure 3.4: Data Collection Process

3.6 Data Sources

There were two major sources commonly used in research, namely primary and secondary data. Each source is described in greater detail below.

3.6.1 Primary Data

Primary data are original data that are collected specifically for the research problem at hand, using procedures that are best suited to the research problem (Hox & Boeije, 2005). The primary data for this study was collected directly from the program's community farmers. The urban farmers (program's participants) were informed about the purpose of the study, the duration of the interview session, and their consent was obtained. Data collection utilized a structured questionnaire that was developed based on insights derived from an extensive literature review and input gathered during focus group discussion with program participants and stakeholders. At the end of the interview and survey session, participants were given souvenirs as a token of their valuable time.

3.6.2 Secondary Data

Secondary data refers to information originally collected for a different purpose other than the present research and repurposed to address a new set of questions. For this study, materials such as journal articles, thesis, statistical reports, urban agriculture online talks, *et cetera*, were gathered through online search and the resources available at the UPM library. The secondary data provided essential support in shaping the research design and informed the approach to collecting primary data, all of which instrumental in the evaluation of the DOA's UAP.

3.7 Instrument Development

An instrument is any tool used to gather, measure, or analyze information (Bhasah, 2007). The development of research instruments followed a systematic process to ensure that they aligned with the study's objectives. The questionnaire was developed based on a comprehensive review of literature that addressed the fundamental dimensions of the study—context, input, process, product, and program effectiveness. This is followed by expert consultations through semi-structured interview where in-depth discussions were conducted with stakeholders. Their input and knowledge of contextual dimensions, as well as confirmation help refine the questionnaire.

3.7.1 Questionnaire Design

To observe changes within the program development process, Razak (2018) proposed using questionnaires as a research tool. According to Tuckman (2003), questionnaires are an effective method for gathering information. This research tool includes statements that align with the research objectives, where questions are formulated following a comprehensive synthesis of prior studies and relevant information related to program evaluation. The questionnaire for this study was organized into three sections: A, B, and C.

Section A includes questions related to the respondents' background. Section B contains questions focused on the CIPPE, which covers Context, Input, Process, Product, And Program Effectiveness assessments. Responses in this section are based on a 5-point Likert scale: 1 – Strongly disagree, 2 – Disagree, 3 – Not sure, 4 – Agree, and 5 – Strongly agree, and the respondents were asked to select only one option per item. Meanwhile, Section C features additional questions regarding challenges in community gardens and participants' suggestions for program improvements. The complete questionnaire content is presented in the following Table 3.6:

Table 3.6: Segmentation of Survey Questionnaire by Section

Section	Dimension/Topic	Number of Items	Type of Question
A	Respondents Profile	8	Closed-ended
	Community Gardens Profile	12	Closed-ended
B	1. Context Evaluation	11	5-point Likert scale Strongly disagree-strongly agree
B	2. Input Evaluation	10	5-point Likert scale Strongly disagree-strongly agree
	3. Process Evaluation	10	5-point Likert scale Strongly disagree-strongly agree
	4. Product Evaluation	10	5-point Likert scale Strongly disagree-strongly agree
	5. UAP Effectiveness	10	5-point Likert scale Strongly disagree-strongly agree
C	1. Problems on UAP	1 (a-n)	Closed-ended
	2. UAP Improvement Needs	1 (a-o)	Closed-ended

Table 3.7 displays the list of items used to assess the study's variables, along with their sources. All items utilized in this research are positive statements. The items measuring the additional dimension of Program Effectiveness were specifically developed for this study, drawing from prior research. Items for the Context, Input, Process, and Product dimensions were adapted from previously validated instruments and tailored to focus on UAP. The questionnaire was adapted from studies titled "*Keberkesanan Pelaksanaan Program My Kampung My Future di Malaysia*" (Fatin Ishak, 2019), "*Keberkesanan Program Latihan Pembangunan Usahawan dalam Konteks Aplikasi Amalan Perniagaan Peserta Menurut Perspektif Islam*" (Razak, 2018), and "*Kerangka Penambahbaikan Pelaksanaan Program Diploma Kejuteraan Mekatronik Politronik di Malaysia*" (Yasin, 2017). These questionnaires followed the CIPP evaluation framework, which aligned with the objectives of this study.

For the Program Effectiveness section, the questions were adapted from studies titled "The Relationship between Formal Mentoring Program Characteristics and Perceived Program Effectiveness" (Allen et al., 2006), "The Assessment of Management Effectiveness Program on Organizational Performance Satisfaction" (Nugroho et al., 2020), and "Program Effectiveness Survey" (Laukaitis, 2016), given their contextual similarities and relevance with the present study. These studies served as the primary sources for question development, with modifications performed to fit the specific needs of this research.

Table 3.7: List of items used to develop research instruments

Dimension	Codes	Questions/Items	Sources
Context (Relevance of UAP Objective and purpose)	A1	The objective of UAP is suitable to help in reducing the living cost among urban gardeners.	Ishak (2019)
	A2	The objective of UAP is suitable to help in creating community farming activities that produce enough food for families.	Ishak (2019)
	A3	The objective of UAP is suitable to help in creating community farming activities that produce quality and safe food.	Ishak (2019)
	A4	The objective of UAP is in line with the program's direction, which is to create social interaction in the community.	Ishak (2019)
	A5	The purpose of UAP is very relevant to support the guarantee of food supply (sufficient, easy access, availability of food, and others) at the household level.	Razak (2018)
	A6	The purpose of UAP is very suitable to reduce the import of agricultural products from foreign countries.	Razak (2018)
	A7	The purpose of UAP is suitable to instill the interest of citizens in cultivating crops.	Razak (2018)
	A8	The purpose of UAP is relevant in implementing the production of sustainable food sources.	Razak (2018)
	A9	The purpose of UAP is suitable to improve the economy of the participant's household.	Razak (2018)
	A10	The purpose of UAP is relevant to create harmonious and prosperous community relations.	Razak (2018)
	A11	The purpose of UAP is relevant to advancing the Malaysian agriculture sector.	Razak (2018)
Input (Incentives provided)	B1	Appropriate technological facilities have been provided to assist the program participants.	Yasin (2017)
	B2	Incentives and assistance were provided to the program participants to start garden activities (e.g., financial, seeds, kits, fertilizers, etc.).	Razak (2018)

Table 3.7: Continued

Input (Incentives provided)	B3	Extension services are provided continuously to the program participants to help them to solve crop problems.	Razak (2018)
	B4	Urban agriculture training/courses have been organized to explain the theoretical knowledge and techniques related to crops, to the program participants.	Yasin (2017)
	B5	Demonstrations of agricultural methods have been shown to help the program participants in mastering the skills and knowledge of agriculture.	Ishak (2019)
	B6	Exhibitions related to agriculture were given to instill the interest of program participants in farming.	Ishak (2019)
	B7	Virtual and face-to-face exhibitions have been implemented to make it easier for program participants to obtain information about agriculture.	Ishak (2019)
	B8	Experienced and knowledgeable Agricultural Extension Officers are assigned to assist program participants.	Ishak (2019)
	B9	Agricultural Extension Officers skilled in communication are assigned to discuss the crop problems program participants faced.	Yasin (2017)
	B10	Active and highly committed Agricultural Extension Officers are assigned to provide guidance to program participants.	Ishak (2019)
Process (Implementation process)	C1	Department of Agriculture and certain parties are often involved in monitoring to ensure that UAP activities run smoothly.	Ishak (2019)
	C2	Agricultural Extension Officers have explained the concept and method of producing downstream products from crops.	Ishak (2019)
	C3	Agricultural Extension Officers always plan the community garden activities to ensure UAP run well.	Ishak (2019)

Table 3.7: Continued

Process (Implementation process)	C4	Agricultural Extension Officers always recommend planting methods to help participants to improve crop performance.	Ishak (2019)
	C5	Agricultural Extension Officers always encourage participants to practice sustainable agriculture.	Ishak (2019)
	C6	Agricultural Extension Officers monitor the farm records of participants periodically to evaluate their performance.	Ishak (2019)
	C7	Agricultural Extension Officers always involve the participants during agricultural methods demonstrations.	Ishak (2019)
	C8	Agricultural Extension Officers recommend the type of technology and crops that are suitable for the characteristics of the garden area.	Ishak (2019)
	C9	Agricultural Extension Officers always carry out UAP activities with participants through various methods (e.g., social media or face-to-face).	Ishak (2019)
	C10	Agricultural Extension Officers always give clear feedback to help the participants understand agriculture-related matters.	Ishak (2019)
Product (Impact and changes on participants)	D1	I understand more about the method to produce crops that are safe to eat.	Ishak (2019)
	D2	I understand the method of producing downstream products from crops after participating in the program.	Ishak (2019)
	D3	I have mastered managing vegetable expenses efficiently after participating in the program.	Ishak (2019)
	D4	I am able to teach my friends again about the agricultural knowledge gained through participation in UAP.	Ishak (2019)
	D5	I have managed to reduce the amount of household spending on buying vegetables after participating in UAP.	Ishak (2019)
	D6	I have successfully earned a side income through UAP.	Ishak (2019)

Table 3.7: Continued

Product (Impact and changes on participants)	D7	I become easier to communicate with the gardeners about agricultural activities after participating in UAP.	Ishak (2019)
	D8	My relationship with my fellow gardeners became closer after participating in UAP.	Ishak (2019)
	D9	My health improved after participating in UAP.	Ishak (2019)
	D10	My health improved after participating in UAP.	Ishak (2019)
UA Program Effectiveness (Impact and changes on overall program)	E1	UAP has opened an opportunity for a local citizen to become a successful farm entrepreneur.	Nugroho et al. (2020)
	E2	UAP has successfully applied sustainable farming practices that are safe for the environment (e.g., avoiding soil erosion, water pollution and others).	Nugroho et al. (2020)
	E3	UAP has given early exposure to agricultural education to the youth to participate in the agriculture field.	Nugroho et al. (2020)
	E4	UAP has increased the access of the population to food crop sources.	Laukaitis et al. (2020)
	E5	UAP has increased in terms of number (e.g., the number of urban gardens).	Nugroho et al. (2020)
	E6	UAP becomes more systematically through the monitoring of agency (e.g., urban garden management).	Laukaitis et al. (2020)
	E7	UAP has increased the agricultural production in the city (e.g., increased urban garden production).	Nugroho et al. (2020)
	E8	Efforts of the government and various parties to help in food security at the household level have been achieved through UAP.	Allen (2006)
	E9	Program participants understand the concept of crops and downstream products introduced by the Department of Agriculture and agricultural agencies.	Laukaitis et al. (2020)
	E10	UAP has been successfully promoted and recognized by various parties and age groups.	Allen (2006)

New questions were also developed for this study based on the conceptual framework within the study structure. The draft questionnaire was thoroughly reviewed in collaboration with agricultural officers from the Urban Agriculture Unit of the Department of Agriculture, Malaysia, as well as several senior lecturers from the Faculty of Agriculture and the Faculty of Educational Studies at UPM. These experts possess specialized knowledge in agricultural extension, program evaluation, and module development, which helped in assessing the appropriateness and clarity of the questions.

The discussions led to modifications and the removal of unclear or unsuitable questions. Some of the statements were refined, with improvements made to language, clarity, and explanatory depth to ensure they aligned with the study’s objective. After refining, a revised version of the questionnaire was sought for approval by the research supervisor and a pilot study was conducted. Expert validation was also sought to assess the validity and reliability of the questionnaire.

3.7.2 Semi-structured Interviews

Interviews often involve a researcher who asks an individual an oral question that elicit verbal responses in return. The main aim of the interview is to obtain specific information (Lebar, 2006). Through interviews, the researcher will be able to access the ideas, thoughts, and memories of the respondents themselves (Hesse-Biber & Leavy, 2006).

According to Noraini (2010), semi-structured interviews involve pre-determined questions, but the sequence can be adjusted based on the participant's responses. Additional relevant questions can also be included, and less appropriate ones can be removed. For this reason, the interview questions were prepared in advance. Expert reviewers were also consulted to review the content, scope, format, and appropriate methodology for conducting the semi-structured interviews.

In this study, nine active community garden leaders were selected. This qualitative sample was chosen based on specific criteria, with participants who possess extensive knowledge about the issues being examined (Meriam, 2001). The semi-structured interview questions were developed within the context of UAP under the CIPPE dimensions. The content was derived from document analysis provided by the Department of Agriculture and discussions with experts. The following questions were asked:

A. CONTEXT DIMENSION EVALUATION

1. What are the main factors that motivated your participation in the UAP?
2. Has your interest in gardening increased since joining the UAP?
3. Have your objectives for joining the UAP been achieved?

B. INPUT DIMENSION EVALUATION

1. What resources or inputs have you received as a participant in the UAP?
2. Are the facilities and equipment provided by the DOA sufficient for the activities in which you’ve participated in the UAP?
3. Are the facilities and equipment provided by the DOA appropriate for the activities in which you’ve participated in the UAP?
4. Is the financial support and other assistance (e.g., advisory services) provided by the DOA sufficient for the UAP?

C. PROCESS DIMENSION EVALUATION

1. Does the DOA regularly monitor the community garden areas?
2. Are you satisfied with the knowledge provided on soil quality for urban farming?
3. Do you voluntarily attend various courses to gain knowledge on planting activities?
4. Does the community leader encourage members to gain technical knowledge, such as information about soil quality, fertilizers, and garden visits?

D. PRODUCT DIMENSION EVALUATION

1. Are you satisfied with the implementation of the UAP so far?
2. Are you satisfied with the additional income you've gained since joining the Urban Agriculture Program (e.g., savings on vegetable expenses)?
3. Has your garden become more vibrant and cleaner since joining the Urban Agriculture Program?
   - How is the community garden waste managed?
   - Who is responsible for regularly handling the cleaning (schedule)?

E. URBAN AGRICULTURE PROGRAM EFFECTIVENESS EVALUATION

1. Do you think the UAP should continue in the future? Can you suggest new elements to improve the program?
2. How would you rate the overall UAP (stars)?
3. Are you willing to continue your commitment to supporting the UAP?
   - Spend time
   - Promote the program to others
   - Collaborate with external agencies
   - Support and encourage other family members to get involved

3.7.3 Steps on Instrument Development

According to Mohamed (2015), instrumentation is a complex process that is crucial for research studies. It involves creating, testing, and implementing tools or materials for data collection. In the current study, this process is divided into two distinct stages, specifically for the development of questionnaire instruments.

Stage 1: Instrument Development

1) Identifying theory or model: The first step in creating a questionnaire is to identify a relevant theory or model that will serve as the foundation for the research instruments. This is consistent with the views of scholars like Creswell (2014), who stress that research instruments should be rooted in established theoretical frameworks to ensure their validity and applicability.
2) Collecting related attributes: The next step is to gather all the attributes associated with the identified theory or model in a systematic manner. This involves conducting a thorough review of relevant literature, consulting with subject matter experts in the field, and comprehensively examining prior research (Booth et al., 2016). This approach ensures that the instruments are well-informed by a rich understanding of the existing knowledge landscape.
3) Developing own instrument: With a deep understanding of the chosen theory or model and its related features, the researcher begins to construct a unique instrument that is customized to suit the study's specific needs and nuances. This approach aligns with the advice of experts such as Dillman (2014), who recommends that survey instruments should be adjusted to ensure their suitability for the study's distinctive circumstances.

Stage 2: Validation of Instruments

1) Content Validity (Experts Validity): The process of validating research instruments begins with a thorough examination and evaluation of content validity by subject matter experts. This step is critical to ensure that the instruments accurately and comprehensively capture the intended content. As

recommended by DeVon et al. (2007), this process helps to enhance the validity and relevance of the instruments to the research objectives.

2) Construct Validity (Statistical Analysis): After ensuring that the content of the instruments is valid, then a rigorous assessment of construct validity is undergone through statistical analysis. To scrutinize the instruments' ability to measure the intended constructs effectively, techniques like factor analysis or structural equation modeling, as recommended by Hair et al. (2017), were used to ensure quantitative rigor of the validation process.

To ensure the credibility and reliability of the collected data for a research study, the researcher follows a systematic approach that involves structured stages. By doing so, it will align with established methodologies and fortifies the integrity of its questionnaire instruments. This comprehensive approach is crucial in generating meaningful and reliable research outcomes.

3.8 Pre-Test

The pre-test is the stage in the research process at which fundamental problems in a survey can be identified and corrected (Lehmann, 1989). It is also the stage most likely to be squeezed out due to cost/time pressure (Hunt, Sparkman & Wilcox 1982). The purpose of the pre-test is to determine "face validity". Face validity is the process of measuring a variable or construct using a superficial and subjective assessment. Before being distributed to the target population, a good questionnaire will be tested on a small number of respondents usually involving 5-10 respondents (Wan & Noraini, 2021). The pre-test procedure can determine whether the interviewees understand the questions and provide useful answers for quality improvement. A pre-test was done to ensure that the questionnaires were well understood by the respondents before conducting the pilot test. The pre-test was carried out at the Surau Al-Sobah Community Agricultural Garden, Section 3, Bangi, Selangor on August 21, 2022. Six respondents in total were chosen at random from the pre-test to represent the garden community. The pre-test findings were noted, and the subsequent course of action is shown in the appendix.

3.8.1 Face Validity and Content Validity

Validity ensures that an instrument measures what it is intended to measure. **Face validity** is the simplest form of validity, where a test appears to measure the intended construct based on a casual review by subject matter experts or potential users. It does not require detailed analysis but ensures that the items look relevant and meaningful to the respondents, which can motivate them to engage more actively in the test.

In contrast, **content validity** involves a thorough assessment to ensure the test comprehensively covers all aspects of the construct being measured. This is typically done by a panel of experts, both content experts and representatives from the target population, to ensure the instrument is relevant and understandable to both groups. Lynn (1986) recommends using at least five experts to ensure content validity, with consensus among them being crucial for achieving a high content validity index (CVI). This ensures all elements of the construct are well-covered. Including experts from the target population further enhances the questionnaire's relevance and accuracy (Rubio et al., 2003; Halek et al., 2024). Subject matter experts typically validate content validity due to their expertise in the construct being measured.

Therefore, face validity provides an initial, subjective check of relevance, while content validity offers a deeper, more systematic examination of whether the instrument thoroughly captures the construct it aims to measure. Both play important roles in ensuring the quality and effectiveness of the testing instrument. Table 3.8 below outlines the experts who reviewed all the items and approved as to which item should be included.

Table 3.8: Qualifications and Affiliations of Expert Validators

Formal Title	Faculty	University/Department
Associate Professor	Agriculture	Department of Agriculture Technology
Dr (PhD)	Agriculture	Department of Agriculture Technology
Associate Professor	Agriculture	Department of Agribusiness and Bioresource Economics
Professor Emeritus	Faculty of Educational Studies	Department of Professional Development and Continuing Studies.
Sir/Mrs.	Assistant Director, Urban Agriculture Unit, Agriculture Planning Section	Department of Agriculture

3.9 Pilot Test of Questionnaire

A pilot study is the first stage of a trial (preliminary trial) before the actual test items are applied to the actual sample. The pilot test's mission is to acquire data from the pilot test that is transparent and to evaluate the consistency of the items' level, objectives, comprehensibility, usability, and written instructions (Ghazali & Sufean, 2016). After the questionnaire has undergone a pretest, it is ready for a pilot test. A pilot test of the questionnaire (with 30 to 40 respondents) is useful for reviewing content, clarity, layout, timing, and other factors (Wan & Noraini, 2021).

3.9.1 Validity of Measurement

Validity in quantitative research is described by Wainer and Braun (1998) as a "construct validity". Validity means that a researcher is accurately measuring the intended construct or, more broadly, how truthful the research results are. A simple statement that is valid may be meaningless unless it specifies the type of validity under consideration. Golafshani (2003) highlights two key aspects of reliability and validity in quantitative research: 1) in terms of reliability, it considers whether the outcome is repeatable, and 2) in terms of validity, whether the means of measurement are accurate and are measuring what they are supposed to measure.

However, these quantitatively defined terms may not apply to the qualitative research paradigm. In the qualitative paradigm, reliability and validity are conceptualized as trustworthiness, rigor, and quality (Golafshani, 2003). Achieving these standards often involves triangulation, a method employed to eliminate bias and increase the truthfulness of a proposition about some social phenomenon (Denzin, 1978). Therefore, one way to ensure that both validity and reliability are achieved in any relevant research concepts is to conduct pilot study to reflect the multiple ways of establishing truth.

3.9.2 Reliability Analysis

Instruments chosen for data collection in any research design must pass validity and reliability tests before they can be considered good measures (Gazali, 2018). The concepts of reliability and validity are tools of a primarily positivist epistemology (Winter, 2000). Reliability denotes the ability to measure something consistently over time and if the results of a study can be replicated using a similar methodology, the research instrument is considered reliable (Fitzner, 2007; Golafshani, 2003).

In this study, respondents were given a questionnaire containing items that assessed dimensions and elements on a Likert scale. The results of this pilot study were analyzed using IBM SPSS 25. However, before conducting a pilot study using the constructed instrument, the instrument was determined in advance from the aspects of face and content validity.

In this study, 36 urban agriculture participants from community garden Jalan Tuntung Seksyen 20, Shah Alam, were involved in the pilot test. This process involved examining item functionality from the aspects of reliability in determining the dependent item and item difficulty levels, as well as respondents' agreement.

According to Bond and Fox (2015), the acceptable Cronbach's Alpha (a) value for reliability is between 0.71 and 0.99, a standard also corroborated by George and Mallery (2003), as presented in Table 3.9. In general, a Cronbach alpha coefficient should ideally be greater than 0.70 (DeVellis, 2003).

Table 3.9: Rule of Thumb for Cronbach's Alpha

Cronbach's Alpha Score	Reliability
0.9-1.0	Excellent
0.7-0.8	Good
0.6-0.7	Acceptable
<0.6	Poor
<0.5	Unacceptable

(Source: Hair et al., 2006)

Cronbach alpha values for both pilot and actual tests are shown in Table 3.10, which ranged 0.883-0.898 and 0.828-0.890, respectively. The values fell within the acceptable range (above 0.8), as suggested by Hair (2006).

Table 3.10: Reliability Coefficient for Pilot test and Actual Test

Variables	Pilot Test (n=36)		Actual Test (n=230)	
	No. Items	Alpha (α)	No. Items	Alpha (α)
Context	11	0.884	11	0.849
Input	10	0.883	10	0.884
Process	10	0.898	10	0.890
Product	10	0.876	10	0.828
Effectiveness	10	0.894	10	0.858

3.10 Pilot Test of Semi-Structured Interview

The validation of the interview protocol was also conducted. To achieve this, the researcher met face-to-face with UAP participants to verify the dimensions and items included in the semi structured interview. After obtaining feedback, opinions, and suggestions from the program participants (informants), the researcher then refined the interview protocol to enhance clarity and facilitate the participants' engagement during the interview sessions.

Additionally, the semi-structured interview used in this study was subjected to review and validation through peer examination. As part of this process, two experts were contacted and invited to review and validate the research data. The criteria for selecting these experts included holding at least a PhD in their respective fields and having prior direct involvement in this study. Thus, one expert specializing in agricultural extension and another expert in qualitative research contributed to the peer review process for this study.

3.11 Data Analysis Techniques

The data collected were analyzed using Statistical Package for the Social Sciences (SPSS) version 25. To describe the socio-demographic features of the respondents, descriptive statistics (frequency distribution, mean and standard deviation) were used to interpret the findings, while inferential techniques were applied to investigate relationships between the variables and their implications for the broader population under study. In this regard, data was examined with the use of SMART-PLS Version 3.0. The UAP implementation improvement framework was also developed using the same software. The following Table 3.11 provides a summary of the software (tools) and techniques used for statistical analysis in the present study.

Table 3.11: Analysis of Research

	Objectives	Analysis
Objective 1	To evaluate the level of the Context, Input, Process, Product and Program Effectiveness dimensions.	Descriptive analysis (compute mean score divide into 3 categories: 1.00 to 2.399, 2.34 to 3.699 and 3.7 to 5.0 for low, medium and high, respectively.
Objective 2	a) To determine the relationship between Context, Input, Process, Product towards Program Effectiveness of UAP. b) To develop a framework for improving UAP implementation.	Structural Equation Modeling Using Partial Least Square (PLS-SEM).

3.11.1 Preliminary Analysis

Prior to data analysis, it is essential to conduct data preparation using preliminary instruments. This is to ensure that the data collected via the questionnaire is properly transformed for data analysis and can be analyzed to produce significant outcomes. The purpose of preliminary analysis is to affirm that the collected data is devoid of missing values and outliers and to determine whether or not it is normally or non-normally distributed. Nazuri (2021), Shukri (2020), and Ramalingam (2018) carried out preliminary analysis to locate outliers and ensure that the data was normally distributed. In the end, statistical analyses such as descriptive analysis and partial least square structural equation modelling were carried out on the data that fulfilled the requirements of the psychometric assumptions.

1) Data Screening and Missing Values Treatment

The process of screening and cleaning entails the detection and correction of errors and absent values in the data file. In data analysis, missing data is one of the most pervasive issues. Therefore, descriptive statistics and frequency distribution were employed to identify the minimum, maximum, and missing value for each item, ensuring that the input data falls within the range of accurate values (Pallant, 2013).

The Little MCAR test also was performed to determine whether the study data is missing at random (MAR) or missing completely at random (MCAR). This is because missing data can be categorized into two types: 1) amount of missing data, and 2) pattern of missing data. However, Tabachinick and Fidell (2007) argue that the type of data loss is more significant than its magnitude. But if the results are negligible, the study data is lost entirely at random (MCAR), and the EM technique is then needed. Following data entry into the SPSS and inspection, there were no missing data confirmed (Figure 3.5). Consequently, no action was needed to address the issue of data loss.

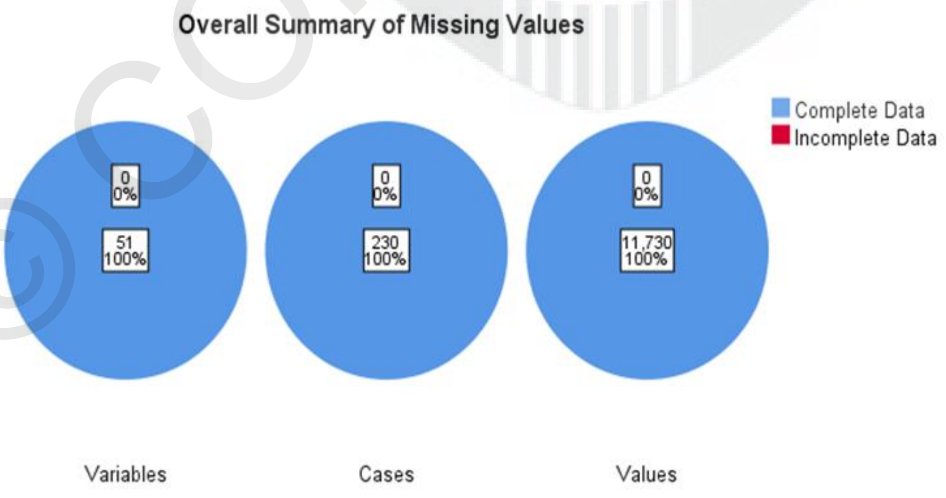

Figure 3.5: Summary of Missing Value

2) Test of Outliers

Tabachinick and Fidell (2007) describe outlier as a case that distorts statistics due to an extreme value on one variable (a univariate outlier) or an odd combination of scores on two or more variables (a multivariate outlier). There are two methods available for detecting outliers: univariate and multivariate analysis. Univariate outliers are cases with an extreme value on a single variable, whereas multivariate outliers are cases with an atypical combination of scores on two or more variables. Identifying univariate outliers is simpler. When performing univariate outlier detection, the data must first be transformed into a standardized z-score. When the variable is transformed into a numerical value (the standard z score), it must be less than 3.29, as stated by Tabachinick and Fidell (2007). Outlying values are those that fall outside the range of 3.29. Hair et al. (2009) recommends 3–4 z units off the mean for big samples (80 respondents or more). As a measure, the current study used a standardized z-score value of less than 3.29 to locate the univariate outliers. The detection of multivariate outlier, on the other hand, relies on a ratio obtained by dividing the Mahalanobis distance (D^2) by df. The data is outlier-free if the D^2/df ratio is below "2.5" for small samples and below "4" for large samples (Hair et al., 2009). In addition, a conservative outlier probability estimate ($p<0.001$) was employed for the X^2 value. According to Fox (1991), influence arising from leverage and discrepancy can be measured by examining the regression coefficients after case deletion. Cases with influence scores greater than 1.00 are flagged for further scrutiny.

3) Test of Normality

Whether or not inference is the end goal of a multivariate investigation, screening continuous variables for normality is a crucial first step. Before conducting multivariate data analysis, such as regression analysis and structural equation modelling (SEM), it is necessary to establish that the data is regularly distributed. Variable normality is determined using either statistical or graphical methods. Skewness and kurtosis are two components of normality. Skewness is related to the symmetry of the distribution; a variable is said to be skewed if the mean is not located in the middle of the distribution. The peakedness of a distribution is related to kurtosis; a distribution is either too peaked (with short, dense tails) or too flat (with long, thin tails). When a distribution is normal, its skewness and kurtosis both have values of zero. When the skewness score is outside of ±1 or the kurtosis rating is outside of ±2, it is argued that the variable does not comply with the normality assumption (Kline, 2005). Because of this, the cutoff value for the skewness test and the kurtosis test in the current investigation was set at ±1.25.

3.11.2 Descriptive Analysis

Descriptive analysis seeks out patterns in data that aims to answer questions such as who, what, where, when, and to what extent. Almost every research project requires descriptive analyses; in social science research, it is often employed to derive the mean, percentage, frequency distribution, and standard deviation for comprehensive profile of the respondents of the study. It facilitates in understanding the respondents' social structure and social relationships of a study (Muhammad et al., 2020).

In this study, the mean score and standard deviation values were used to report the level of appropriateness in evaluating the program's Context, Input, implementation process, outcomes, and overall effectiveness. Statements were presented in the form of questions with the five-response options of Likert scale. The mean summated score was calculated to determine the level of each variable, and the resulting value ranged from 1 to 5, which was adapted from Ishak (2017). For low, medium, and high levels, the mean score was divided into three categories: 1.00 to 2.32, 2.33 to 3.65, and 3.66 to 5.0, respectively.

The mean scores derived from Likert-scale data are often grouped into categories to assess overall trends without assuming equal intervals between the response options, a common critique of using means for Likert scales. Categorizing the mean scores into three levels (low, moderate, high) allows researchers to summarize the data in a way that is comprehensible and actionable for decision-makers. This approach is commonly used in educational and program evaluations, as it bridges the gap between statistical analysis and practical interpretation.

Dividing Likert scale data into ordinal categories is a common practice that aids in interpreting trends and making results more meaningful, especially in research fields such as social or behavioral studies. Norman (2010) highlights that this approach allows for the simplification of data, facilitating the analysis of complex subjective responses while maintaining relevance to the research context.

In educational research, this method proves particularly beneficial as it categorizes mean scores in ways that clarify participants' perceptions or attitudes. Sullivan and Artino (2013) emphasize that this clarity is essential when dealing with subjective responses, such as those derived from Likert scale surveys, as it enables researchers to draw more precise conclusions about trends in perceptions and behaviors. This method enhances the practical application of findings in both educational and social science research.

3.11.3 Partial Least Squares Structural Equation Modeling (PLS-SEM)

Partial least squares structural equation modeling (PLS-SEM) is used to estimate complex cause-effect relationships in path models with latent variables. Hair et al. (2019) recommend PLS-SEM for prediction-focused research when latent variable scores are needed for further analysis and for exploratory research aimed at extending existing theories. This justified the use of PLS-SEM in this study as the appropriate technique for developing an improved framework for UAP.

The analysis was conducted using the Smart-PLS software, a tool known for its applicability to both small sample sizes and is effective for larger ones as well (Hair et al., 2017). It is also ideal for cases with unclear models or theories (Hair, 2014), which aligned with the needs of this study. Therefore, Smart-PLS was chosen for its accuracy and adaptability (Wong, 2010).

The first step in evaluating PLS-SEM results is examining the measurement models. Guidelines for interpretation vary based on context, with reliability thresholds of 0.60 for exploratory research and 0.70 for established measures (Chin, 2010; Hair et al., 2017). Robustness checks ensure result stability, and their importance depends on the research context.

PLS-SEM is a type of analysis method that can be utilized when working with structural equation modelling (Table 3.12). PLS-SEM was chosen in this study because PLS can handle data that is not normally distributed. In addition, PLS-SEM is a prediction-oriented modeling approach that seeks to optimize the explained variance (R^2 value) (Hair, Ringle, & Sarstedt, 2012) of independent variables on predicting the dependent variable.

Table 3.12: Criteria for Structural Equation Model (SEM) Using PLS-SEM

Criteria	PLS-SEM	Present Study
Research Goals	1. If the goal is predicting key target construct or identifying key driver. 2. If the research is exploratory or an extension of existing structural theory.	Modified the existing theory of CIPP by including variable of Program Effectiveness (extension of existing model).
Measurement Model Specification	1. If formative measured constructs are a part of the structural model.	Reflective measured constructs.
Structural Model	1. If the structural model is complex (many constructs and many indicators).	Direct effects relationship
Data Characteristics and Algorithm	1. If sample size is relatively low 2. If data to some extent non-normal	The normal distribution has been violated (non-normal data)
Model Evaluation	1. If latent variable scores are required in subsequent analysis.	Latent variable score needed for further analysis.

(Source: Ramayah et al., 2018)

According to Hair et al. (2016), the selection of an analytical method should be guided by its suitability to the characteristics and objectives. For this study, the PLS-SEM was deemed appropriate as it sought to extend the theory of CIPP evaluation model by including the variable of effectiveness to measure the overall achievement of program objectives. Thus, the conceptual framework of this study aligns with the nature of exploratory study (extension of existing theory), which aimed at creating the model improvement of UAP implementation framework.

The use of PLS-SEM was also driven by several factors, with the first being the aim of the present study, which is to predict key target variables. Second, the sample size of the study of 230 participants and third, the data deviated from the normal distribution. Ishak (2018) reported the data distribution of her study is not normal when the significance level of the Kolmogorov-Smirnov test is lower than 0.05. Similarly, this study parallels findings from Ishak (2018) and Nazuri (2021), who employed PLS-SEM to handle non-normal data characteristics. Given these methodological challenges, the choice of PLS-SEM analysis is practical. A detailed description to Partial least Squares Structural Equation Modelling follows to contextualize its application in this study.

1) Measurement Model Assessment

A measurement theory defines the relationship between the constructs in a theoretical model and the variables used to measure them (Hair et al., 2010). According to Ramayah et al. (2018), the assessment of the measurement model includes looking at its internal consistency, convergent validity, and discriminant validity (Figure 3.6).

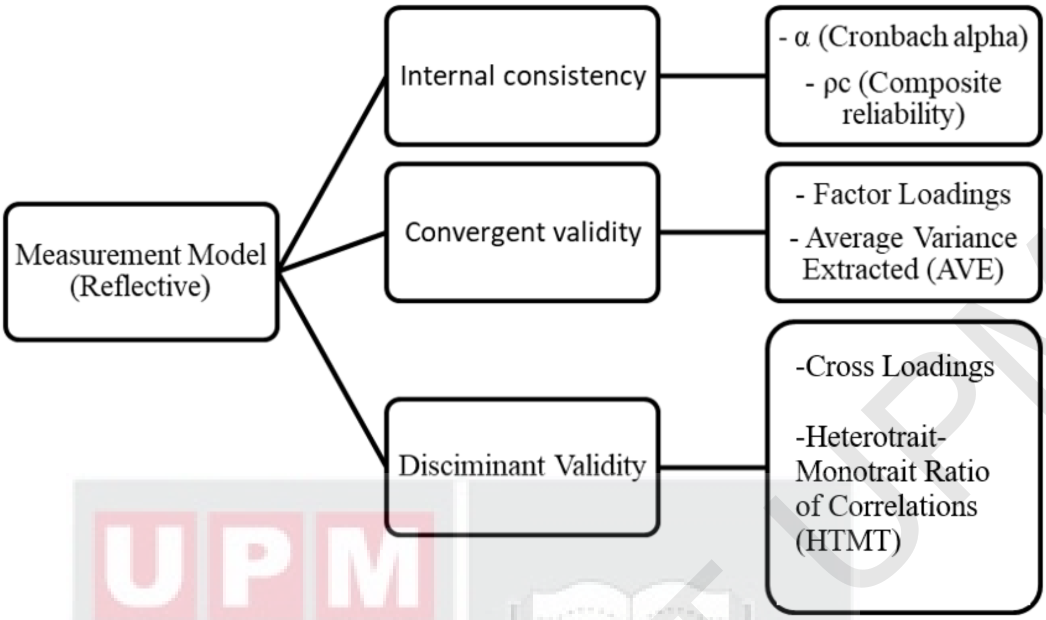

Figure 3.6: Reflective Model Assessment
(Source: Ramayah et al., 2018)

Internal consistency of the measurement is typically determined by assessing the composite reliability (CR). It should be greater than 0.6 to be deemed acceptable in exploratory research, 0.70-0.90 in satisfactory conditions, and greater than 0.90 in cases where reliability might indicate redundancy (Gefen, Straub, & Boudreau, 2000).

Following that, factor loadings are used to check for convergent validity. Urbach and Ahlemann (2010) define convergent validity as the degree to which indicators of a single construct demonstrate coherence with those of related constructs. Hair et al. (2014) termed this as AVE, which stands for "average variance extracted". To achieve convergent validity, each construct should explain at least half of the variance in observed indicators (AVE $\geq$ 0.50) (Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Hair et al., 2017).

Both Cross Loadings and the Heterotrait-Monotrait Ratio of Correlation (HTMT) are metrics of discriminant validity (Henseler, Ringle, & Sarstedt, 2015). The loadings of indicators for each construct should be greater than 0.1 (Chin, 1998; Snell & Dean, 1992) and greater than the loadings of indicators for other constructs. For HTMT, values below 0.85 (Kline, 2011) or 0.90 (Gold et al., 2001) indicate adequate validity. The HTMT 90% bootstrap confidence interval should not include 1 to confirm discriminant validity. Voorhees et al. (2016) demonstrated that both methods effectively assess discriminant validity. Table 3.13 summarizes the indices of PLS-SEM measurement model.

Table 3.13: Summary of PLS-SEM Measurement Model Analysis Indices

No.	Assessment	Name of Index	Guidelines
1.	Internal Consistency	Composite Reliability (CR)	CR > 0.95 (Not Desirable) CR > 0.7 – 0.9 (Satisfactory) CR > 0.6 (for exploratory research)
2.	Indicator Reliability/Factor loadings	Indicator Loadings	Loading 0.708 or higher is recommended but loading > 0.7, 0.6, 0.5 or 0.4 is adequate if other items have high score of loadings to complement AVE and CR
3.	Convergent validity	Average Variance Extracted (AVE)	AVE > 0.50
4.	Discriminant validity	Cross Loading	Loadings of each indicator are the highest for their designated constructs.
		HTMT Criterion	- HTMT .85 (Kline, 2011) (Stringent Criterion) - HTMT .90 (Gold et al., 2001) (Conservative Criterion) - HTMT inference using bootstrapping technique (Henseler et al., 2015): Does 90% bootstrap confidence interval of HTMT include the value of -1 < HTMT < 1 (Liberal Criterion)

(Source: Ramayah et al., 2018)

2) Structural Model Assessment

The structural model was evaluated after confirming internal consistency, convergent validity, and discriminant validity. Structural model analysis tests the independent links between variables in the research model. Unlike CB-SEM, PLS-SEM lacks a typical goodness-of-fit measure (Henseler & Sarstedt, 2013) and focuses on predicting endogenous variables. Ramayah et al. (2018) identified five criteria for evaluating the structural model: lateral collinearity, coefficient of determination (R^2), path coefficient (t-value, p-value, confidence interval), effect size (f^2), and predictive relevance (Q^2).

The first phase of structural model evaluation addresses lateral collinearity, using tolerance and VIF values. Collinearity is an issue if VIF exceeds 5 (Hair et al., 2011) or 3.3 (Diamantopoulos & Sigouw, 2006). In the second phase, path coefficients are analyzed to estimate the relationships between constructs. The coefficients range from -1 to +1, with bootstrapping used to calculate statistical significance. A minimum significance level of 0.05 is required (Hair et al., 2017).

In the third phase, the model's predictive accuracy is evaluated using R^2. An R^2 of 0.75 is strong, 0.50 is moderate, and 0.25 is weak (Hair et al., 2011). R^2 should exceed 0.10 to ensure sufficient variance explained (Falk & Miller, 1992). In the fourth phase, Cohen's f^2 assesses the effect size of predictor constructs. Values of 0.02, 0.15, and 0.35 indicate small, moderate, and large effects, respectively (Cohen et al., 2003). Lastly, predictive relevance (Q^2) is assessed using the blindfolding procedure. A Q^2 greater than zero indicates predictive relevance of exogenous constructs for the endogenous variable (Fornell & Cha, 1994). Table 3.14 summarizes the indices of PLS-SEM structural model.

Table 3.14: Indices for Structural Model Analysis using PLS-SEM

No.	Assessment	Name of Index	Level of Acceptance	Literature Support
1.	Lateral Collinearity	Variance Inflator Factor (VIF)	VIF ≤ 3.3	Diamantopoulos and Sigauw (2006)
			VIF ≤ 5.0	Hair et al. (2017)
2.	Path Coefficient	Path Coefficient	p value < 0.01 t value > 2.58 (two-tailed) t value > 2.33 (one-tailed)	Hair et al. (2017)
3.	R^2	Coefficient of Determination	0.26 – Substantial 0.13 – Moderate 0.02 – Weak	Cohen (1988)
			0.67 – Substantial 0.33 – Moderate 0.19 – Weak	Chin (1998)
			0.75 – Substantial 0.50 – Moderate 0.25 – Weak	Hair et al. (2017)
4.	f^2	Effect size to R^2	0.26 – Substantial 0.13 – Medium 0.02 – Small	Cohen (1988)
5.	Q^2	Stone-Geisser Q2 Predictive Relevance	Value larger than 0 indicates that exogenous constructs have predictive relevance for endogenous constructs	Hair et al. (2017), Stone (1974) and Geiser (1974)

(Source: Ramayah et al., 2018)

The estimation of Q^2 concludes the structural model examination. Given the study's aim to extend the CIPP model, additional analysis was conducted in order to achieve the objective. Specifically, the Importance-Performance Matrix Analysis (IPMA) was applied to extend the PLS-SEM analysis, using latent variable scores to evaluate both importance (total effects) and performance (average latent variable scores) (Hair et al., 2016). IPMA helps identify key variables, crucial for managerial decisions (Ringle & Sarstedt, 2016). Originally introduced by Martilla and James (1977), IPMA highlights factors with high importance but low performance, guiding improvement efforts. This study used IPMA to assess the relationships between context, input, process, and product in evaluating program effectiveness.

3.11.4 Qualitative Analysis (Semi-structured Interview)

Supporting data for the study was obtained by interviewing the participants of the UAP. The interview questions comprised of two main areas, namely Part A on the demographics of UA participants and Part B on the five (5) dimensions in the CIPPE (Context, Input, Process, Product and Program Effectiveness). There were 19 semi structured questions related to UAP, with the Context dimension containing three questions, four under the Input dimension, six under the dimensions of the Process, and three questions each under the dimensions of Product and Program effectiveness.

The semi-structured interview can be done using various tools, including audio recorders, cassettes, field records, video, telephone and email. The transcription of the interviews was derived from the conversations with the respondents. Ghazali and Sufean (2015) stressed the urgency to perform the transcription as soon as possible to avoid missioning the information or data obtained from the respondent. Once transcription is complete, the theme was identified and the interviews were organized in a manner that aligns with the research objectives, incorporating insights alongside the quantitative findings.

In this regard, the interview in this study is in the form of a semi-structured interview. According to Kakilla (2021), semi-structured interview brings about flexibility to the interviewers on discussing various topics while also allowing interviewees the freedom to provide open-ended responses. On this occasion, building rapport with respondents is essential, with the researcher engaging with participants in a friendly and attentive manner and demonstrating genuine interest in their responses. According to Noraini (2010), qualitative report or analysis does not have a specific method; instead, the structure and content of the report depend entirely on the findings or information obtained by the researcher.

3.12 Summary

This chapter outlined the methodology employed in conducting the study, detailing the procedures and techniques utilized to address the research objectives. A quantitative research design was adopted to collect data, with SPSS software utilized to conduct descriptive statistical analyses, while Smart-PLS was applied to perform inferential analyses. In depth description on the use of PLS-SEM was presented as the study aimed to develop an implementation improvement framework for UAP. The chapter also described qualitative analysis being adopted to provide supplementary data.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter provides a presentation of the analysis results derived from data collected through surveys and semi-structured interviews. The analysis was guided by the conceptual framework outlined in Chapter 3. This chapter reports on the findings, which are organized into three primary sections: preliminary analysis, descriptive analysis, and Partial Least Square Structural Equation Model (PLS-SEM). The subsequent sections delve into the results of these analyses, their implications, and a discussion of their alignment with the study's objectives.

4.2 Preliminary Analysis

Data preparation is one of the most crucial elements in data analysis. It is the process of making sure the information obtained from the questionnaire is properly interpreted for data processing and can be construed to produce accurate results (Hameed & Naumann, 2020). Preliminary analysis was performed to fulfil the requirement of performing multivariate analysis and to confirm the data collected is free from missing values and outliers. Accordingly, assessment of normality, multicollinearity, and common method variance were also carried out. The analysis was accomplished using SMART PLS Software for Partial Least Square Structural Equation Model (PLS-SEM). As prerequisites of PLS-SEM, inspection on consistency and validity issues were performed through measurement model assessment. The preliminary analysis demonstrated that the data met the criteria necessary to carry out the following multivariate analysis.

4.2.1 Data Screening and Missing Values Treatment

Data screening is a procedure that examines and ensures the quality and reliability of statistical analyses by verifying that the data does not contain properties that could compromise result interpretation. This process addresses issues such as contradictory responses and incomplete data, with missing data being one of the most prevalent issues in data analysis. There are two forms of data loss analysis: 1) the quantity of data loss (amount), and 2) the type of data loss (form) (pattern). The type of data loss, however, matters more than the amount of data loss (Tabachinick & Fidell, 2014). In this study, data screening was conducted using the missing completely at random (MCAR) test, descriptive analysis, and frequency distribution in SPSS. To make sure that the entered data falls within the range of accurate values, the minimum and maximum values, as well as the missing values, of each item, were carefully examined. Data entry errors were corrected right away by going back to the original questionnaire if they were discovered during the data screening process. The MCAR test found no incomplete data value, as was the descriptive analysis.

4.2.2 Test of Outliers

The following step involved examining isolated data (outliers). An outlier is a case where the statistics are distorted by either an extreme value on one variable (a univariate outlier) or a strange combination of scores on two or more variables (a multivariate outlier) (Tabachinick & Fidell, 2014). It is crucial to look for outliers in the data set because they could negatively affect the outcomes. Univariate and multivariate methods are both used to find outliers (Lam, 2012). The z score method can be used in univariate analysis to perform this detection, whereas the case-based diagnostic approach with multivariate data. According to Tabachinick and Fidell (2014), the value of the variable must be less than 3.29 when it is converted to a value (standardized z score). Outliers are values that are greater than 3.29. Based on the standardized z score value, which is <3.29 as the benchmark for identifying the univariate outliers, the variable of effectiveness (ZE_Effectiveness) (see Appendix A) had four (4) outliers, and all four responses were omitted.

As for multivariate data, the Mahalanobis distance is typically used to identify the outliers. To prevent the masking effect, it is recommended to use reliable estimates of the mean and the covariance matrix (Rousseeuw & Leroy, 1985; Rousseeuw & von Zomeren, 1990; Rocke & Woodruff, 1996; Becker & Gather, 2001). A multivariate outlier is detected when multiple variables are observed among the data (Tabachnick & Fidell, 2014). Tomietto (2019) noted that Mahalanobis distances exceeding the critical value (or p values <0.001) indicate the presence of multivariate outliers. If any of the probability variables with less than 0.001, they are flagged as multivariate outliers. Therefore, based on this standard, eight cases were detected as multivariate outliers and were removed from the dataset (see Appendix A).

4.2.3 Multivariate Normality Test

Screening continuous variables for normality is a crucial first step in almost every multivariate analysis, especially when drawing inferences is the primary objective. A normality test determines whether sample data was drawn from a normally distributed population. The normality tests supplement the graphical evaluation of normality (Elliot & Woodward, 2007). Testing for normality is critical for continuous data because it determines measures of central tendency, dispersion, and the choice of parametric or nonparametric tests. Besides, it is also important to test before conducting multivariate data analysis such as regression and structural equation modelling (SEM) analysis. There are several methods available to test the normality of continuous data; the two well-known components of normality are Skewness and kurtosis test for dealing with data distribution problems.

Skewness is a measure of symmetry, or more precisely, the lack of symmetry of the normal distribution. Kurtosis is a measure of the peakedness of a distribution. A distribution is called approximate normal if skewness or kurtosis (excess) of the data are between ±1 and ±1 (Prabahaker Mishra et al., 2019). Additionally, when the skewness score or the kurtosis rating are outside of 1 or 2, respectively, a variable is said to violate the normality assumption (Kline 2005).

According to Hair et al. (2009), if the value is greater than ±2.58 for a large sample, the data is said to violate multivariate normality. The present study used ±2.58 as the benchmark value for skewness and kurtosis tests. However, the data distribution did not conform to distribution assumptions (Table 4.1). Therefore, further analysis was conducted, with PLS-SEM being preferred in this study because PLS can handle data that is not normally distributed compared to CB-SEM (Ramayah et al., 2018). Following the preliminary analysis, 230 valid responses were selected for further analysis.

Both Hair et al. (2017) and Cain et al. (2016) suggested that multivariate skewness and kurtosis are measured using the software available in the statistical analysis website available online. The results can be viewed in the following URL address: https://webpower.psychstat.org/models/kurtosis/results.php?url=4ecdc34b2d99ddf620802423a99708db. The findings from assessment of Mardia's coefficient, as depicted in Figure 4.1, revealed that the data collected was not multivariate normal, featuring multivariate skewness ($\beta = 3.796$, $p < 0.01$) and multivariate kurtosis ($\beta = 50.089$, $p < 0.01$). According to Kline (2016), the absolute values should be within the range $\leq \pm 3$ for skewness and $\leq \pm 20$ for kurtosis.

Table 4.1: Assessment of Normality (n=230)

Variables	Min.	Max.	Mean	SD	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
Context	3.00	5.00	4.2597	.37996	.318	.160	-.204	.320
Input	2.00	5.00	4.1417	.50196	-.679	.160	1.609	.320
Process	2.20	5.00	4.1287	.48834	-.189	.160	.517	.320
Product	2.50	5.00	4.0983	.45982	-.072	.160	.389	.320
Effectiveness	3.00	5.00	4.1322	.42715	.108	.160	.069	.320

```
Sample size:  230
Number of variables:  5

Univariate skewness and kurtosis
                       Skewness SE_skew Z_skew Kurtosis SE_kurt Z_kurt
CONTEXT                   0.176    0.16  1.095   -0.381    0.32 -1.191
INPUT                    -0.764    0.16 -4.762    2.022    0.32  6.326
PROCESS                  -0.197    0.16 -1.225    0.755    0.32  2.363
PRODUCT                  -0.009    0.16 -0.059    0.350    0.32  1.094
PROGRAM.EFFECTIVENESS     0.145    0.16  0.901    0.077    0.32  0.240

Mardia's multivariate skewness and kurtosis
                 b         z      p-value
Skewness  3.795995 145.51313 1.998401e-15
Kurtosis 50.089378  13.67591 0.000000e+00
```

Figure 4.1: Output of Skewness and Kurtosis Calculation

4.2.4 Full Collinearity Technique

The present study considered the guidance provided by Kock and Lynn (2012) and Kock (2015) with respect to the Common Method Bias. Given that the data was obtained from a single source, comprehensive collinearity testing was conducted, and the findings are presented in Table 4.2. The VIF values were used to assess collinearity, as recommended by Diamantopoulus and Sigouw (2016), who advise against exceeding a VIF value of 3.3. Hair et al. (2016) proposes a maximum of 5. In this specific investigation, the VIF was lower than 3.3, indicating that the concern for single source bias associated with the data is not necessary.

Table 4.2: Full Collinearity Testing

Construct/Indicator	VIF
Context	1.792
Input	2.964
Process	2.964
Product	1.886
Program Effectiveness	3.095

Note: VIF, Variance Inflator Factor (VIF)

4.3 Data Analysis Result

4.3.1 UAP Participants' Socio-Demographic Profiles (Section A)

Descriptive analysis was performed to determine and explore the socio-demographic characteristics of 230 participants of UAP at community level. In this study, the descriptive analysis described the personal background of the participants, community garden profile, problems and needs of improvements for UAP by estimating the frequency and percentage.

According to Table 4.3, the age range with the highest percentage of participation in this study falls between 50 and 59 years old (34.3%), followed by 60 to 69 years old (23.5%), and 20 to 29 years old (3.0%). Male respondents made up 59.6% of the total respondents in the survey, which is higher than female respondents (40.4%). Majority of the respondents were Malay (59.6%) followed by Chinese (16.5%), while none of the respondents were Indians. Most of the respondents are married (87.8%) and most reported having 6-10 members in the household (3.0%), followed by 0-5 members

(0.4%). In terms of education, 63.5% of the respondents possess SPM/STPM/Diploma qualifications, 16.1% completed secondary school, 8.7% earned bachelor's degrees (8.7%), 7.4% completed primary school, and 2.2% earned other certificates (2.2%). Only a small percentage reported no formal education (1.3%) and 0.4 % held master's and doctoral degrees. Most respondents were self-employed (25.2%), followed by workers in the private sector (21.7%), housewives (21.3%), pensioners (20.4%), civil servants (9.6%), and then others (1.7%). Most respondents (28.7%) reported monthly incomes between RM2,001 and RM3,000.

Table 4.3: Socio-demographic profile of respondents

Characteristics	Frequency (n)	Percentage (%)
Age		
<20	1	0.4
20-29	7	3.0
30-39	23	10.0
40-49	51	22.2
50-59	79	34.3
60-69	54	23.5
>70	15	6.5
Gender		
Male	137	59.6
Female	93	40.4
Ethnic Group		
Malay	190	82.6
Chinese	38	16.5
Indian	00	0.0
Others	02	0.9

Table 4.3: Continued

Characteristics	Frequency (n)	Percentage (%)
Marital Status		
Single	10	4.3
Married	202	87.8
Single father	07	3.0
Single mother	11	4.8
Number of Households		
0-5 person	01	0.4
6-10 person	07	3.0
Education Level		
No school	03	1.3
Primary School	17	7.4
Secondary School	37	16.1
SPM/STPM/Diploma	146	63.5
Degree of Bachelor	20	8.7
Degree of Master	1	0.4
Degree of Doctorate	1	0.4
Others	5	2.2
Employment		
Civil servant	22	9.6
Private servant	50	21.7
Self-employed	58	25.2
Retired	47	20.4
Housewife	49	21.3
Others	04	1.7
Respondent Income		
<RM1,000	61	26.5
RM1,000-RM2,000	56	24.3
RM2,001-RM3,000	66	28.7
RM3,001-RM4,000	19	8.3
RM4,001-RM5,000	13	5.7
>RM5,000	15	6.5

Table 4.4 shows most of the community garden has been established around 2-3 years (40.9%), followed by less than one year (26.1%), 4-5 years of establishment (22.2%) and more than 6 years of establishment (10.9%). Regarding application methods, 59.6% indicated that their participation was initiated through group initiative, followed by the approach by the DOA (40.4%). Land ownership for community gardens predominantly fall under city council jurisdiction (39.6%), followed by pioneer land (17%), privately owned land (12.2%), and others (31.3%). The main reasons for participation in the program were reported as personal interests/hobbies/free time (35.2%) and they have available area to cultivate (16.2%). Other reasons include recommendations by the DOA (14.8%), invitations from friends (14.1%), the pursuit of part-time work or supplementary income (10.2%), already retired (5.9%), family heirloom responsibilities (1.8%), and other reasons (1.6%). Vegetables emerged as the main scope of agricultural activities at the community garden (83.5%), followed by a combination of vegetables and fruits (8.3%), vegetables and aquaculture (3.0%), vegetables, fruits, and aquaculture (2.6%), vegetables, fruits and livestock (1.3%), and exclusive fruit cultivation (1.3%).

Table 4.4: Respondents' urban garden profiles

Characteristics	Frequency (n)	Percentage (%)
Community Garden Establishment		
<1 year	60	26.1
2-3 years	94	40.9
4-5 years	51	22.2
>6 years	25	10.9

Table 4.4: Continued

Characteristics	Frequency (n)	Percentage (%)
Application Methods		
Group initiative	118	59.6
Approach by DOA	112	40.4
Others	0	0.0
Land Ownership		
Own land	28	12.2
City Council land	91	39.6
Pioner land	39	17.0
Others	72	31.3
Reasons of Participation		
Interests/hobbies/free time	172	35.2
Part-time work/extra income	50	10.2
Already retired	29	05.9
Have an area to cultivate	79	16.2
Family heirloom	9	1.8
Invited by friend	69	14.1
Recommended by the DOA	72	14.8
Others	8	1.6
Scope of Agricultural Activities		
Vegetables	192	83.5
Vegetables and Fruits	19	8.3
Vegetables, Fruits, and Livestock	3	1.3
Vegetables, Fruits, and Aquaculture	6	2.6
Vegetables and Aquaculture	7	3.0
Fruits	3	1.3
Livestock	0	0.0
Aquaculture	0	0.0

From Table 4.5, the highest percentage of respondents reporting the application of fertigation systems was 33%, followed by 28.7% employing conventional cultivation system, a combination of conventional, fertigation and hydroponic (13.9%), conventional and fertigation (6.5%), hydroponic (5.2%), conventional and hydroponic (4.8%), conventional, fertigation and aquaponic (2.2%), fertigation and hydroponic (2.2%), conventional, fertigation, hydroponic, aquaponic and others (0.9%), aquaponic (0.4%), conventional and aquaponic (0.4%), fertigation, hydroponic and aquaponic (0.4%), and finally, hydroponic and aquaponic (0.4%). Most of the respondents (66.5%) are practicing partial organic method, followed by fully organic (27.4%) in their community garden. The remaining with much smaller percentages comprised of completely chemical method (6.1%). In terms of the number of individuals in the community garden, the membership groups comprised of between 6-10 peoples (67.8%), followed by 11-15 peoples (12%), 1-5 people (7.4%), less than 5 peoples (4.3%), 16-20 peoples (4.3%), and more than 21 peoples (3.5%).

Table 4.5: System operated in respondents' urban garden

Characteristics	**Frequency (n)**	**Percentage (%)**
Cultivation System		
Conventional	66	28.7
Fertigation	76	33.0
Hydroponic	12	5.2
Aquaponic	1	0.4
Conventional and Aquaponic	1	0.4
Conventional and Fertigation	15	6.5
Conventional, Fertigation and Hydroponic	32	13.9
Conventional, Fertigation, Hydroponic and Aquaponic	2	0.9

Table 4.5: Continued

Characteristics	Frequency (n)	Percentage (%)
Conventional, Fertigation and Aquaponic	5	2.2
Conventional and Hydroponic	11	4.8
Fertigation and Hydroponic	5	2.2
Fertigation, Hydroponic and Aquaponic	1	0.4
Hydroponic and Aquaponic	1	0.4
Others	2	0.9
Agriculture Practices		
Fully organic	63	27.4
Partially organic	153	66.5
Completely non-organic	14	6.1
Number of Community Garden Members		
<5 people	10	4.3
1-5 people	17	7.4
6-10 people	156	67.8
11-15 people	29	12.6
16-20 people	10	4.3
>21 people	8	3.5

Table 4.6 presents a comparison of the respondents' spending amount on vegetables before and after their participation in the UAP. The majority reported spending more than RM101 (21.3%) for vegetables monthly, followed by RM21-RM40 (22.6%), RM61-RM80 (18.3 %), RM81-RM100 (16.1%), RM41-RM60 (14.8%), and less than RM20 (7%) before their participation in the UAP. Since joining the program, their monthly expenses on vegetables have declined significantly, with 27% reportedly spending less than RM20 and between RM21 and RM40; 19.6% spent between RM41 and RM60, 12.2% spent RM81-RM100, 9.6% spent RM61-RM100, and only 4.8% spent RM101.

Table 4.6: Cost comparisons of vegetables expenses before and after UAP participation

Characteristics	Before		After	
Monthly Vegetables Expenses	**Frequency (n)**	**Percentage (%)**	**Frequency (n)**	**Percentage (%)**
<RM20	16	7.0	62	27.0
RM21-RM40	52	22.6	62	27.0
RM41-RM60	34	14.8	45	19.6
RM61-RM80	42	18.3	22	09.6
RM81-RM100	37	16.1	28	12.2
>RM101	49	21.3	11	04.8

Table 4.7 illuminates on the sources of UAP information acquisition and courses/training attendance. The majority respondents indicated that they had receive the UAP information from DOA/agency under MAFI (35.1%), followed by friends (26.4%), neighborhood (24%), company (2.7%), family members (2.2%), and others (1.0%). Meanwhile, 28.7% of the respondents reported they had attended the introduction of crop types of urban garden (theory) course, followed by course of organic pest control management in the urban garden (19.8%), cropping practice/planting methods (19.8%), preparation of urban garden cropping site/plot (13.6%), others (3.8%). However, some reported that they never attended any urban agriculture courses (14.4%).

Table 4.7: UAP information source and course/training received by respondents

Characteristics	Frequency (n)	Percentage (%)
UAP Information Source		
Friends	109	26.4
Family Members	9	2.2
DOA/agency under MAFI	145	35.1
Social media	36	8.7
Neighborhood	99	24.0
Company	11	2.7
NGO	0	0.0
Others	4	1.0
Courses/Training Attended		
Introduction of crop types for urban gardens (theory)	122	28.7
Organic pest control management in the urban garden	84	19.8
Preparation of urban garden cropping site/plot	58	13.6
Cropping practice/planting methods	84	19.8
Never attended any urban agriculture course	61	14.4
Others	16	3.8

4.3.2 Problems Faced by Respondents in UAP (Section C)

Table 4.8 presents a list of challenges faced by the respondents, with the main one being “Crops are easily infected by diseases and attacked by pests” (19.9%), followed by the “Lack of suitable infrastructure to carry out garden activities” (13.9%), “Lack of garden equipment” (13.5%), “It is easy to lose/theft crops” (7.8%), “Lack of participation and involvement of members from the local people” (7.5%), “Geographical features problems in cropping area” (6.7%), “Lack of understanding between urban gardeners” (5.0%), “Program activities organized/promoted by

Agricultural Extension Officers are difficult for participants to follow" (3.4%), "Extreme rain" (2.6%), "Lack of water resources" (2.6%), "There is no leader or head of the garden to guide the participants" (2.2%), and others (1.9%).

Table 4.8: Problems faced by respondents in UAP

Problems	Frequency (n)	Percentage (%)
1. Lack of garden equipment.	100	13.5
2. Lack of suitable infrastructure to carry out garden activities (e.g., stores, cottages, greenhouses, irrigation systems, etc.).	103	13.9
3. It is easy to lose/theft crops.	58	7.8
4. Crops are easily infected by diseases and attacked by pests.	148	19.9
5. Lack of crop management knowledge.	85	11.4
6. Lack of understanding between urban gardeners.	37	5.0
7. There is no leader or head of the garden to guide the participants.	16	2.2
8. Geographical features problems in cropping area.	50	6.7
9. Lack of participation and involvement of members from the local people.	56	7.5
10. Program activities organized/promoted by Agricultural Extension Officers are difficult for participants to follow (e.g., distance, inconvenient time, paid, etc.).	25	3.4
11. Agricultural Extension Officers do not come to monitor and give advice.	13	1.7
12. Lack of water resources	19	2.6
13. Extreme rain	19	2.6
14. Others	14	1.9

In addition, qualitative data also revealed several additional problems and concerns faced by UAP participants. One of the standout issues was the perceived outdatedness of the agricultural techniques introduced to them because they are still learning fundamental techniques. Respondents also highlighted inadequacy of the monitoring scale and the lack of surveillance and input from the agricultural authorities have resulted in the participants feeling less encouraged and welcomed. The respondents also pointed out that the disease problems have led to unprofitability of the produce, especially among those who had hoped to market the fresh produce for additional income. Several informants have mentioned:

"Because we can no longer pursue new techniques. Might have. Because we still use the old techniques: The DOA has a visit. So sometimes people offer me courses and I don't have time to go... which means we are still looking for a way to solve the problem of acidic soil..."

(Informant 1)

"We meet annually even though we have no actual base. Okay, I'm going to MARDI with Agriculture this time. When we meet a successful individual, he is engaged in R&D. He conducted R&D with IDM and others. Why isn't it more sophisticated? Why wasn't the fact that I recently visited MARDI emphasized? As a result of our fertigation, Malaysia is now 18 years old. Israel has reached age 35. I'd like to go somewhere nearby. Why isn't our Ministry promoting these? Why take the fundamental course?"

(Informant 5)

"Monthly observation... It's simply that the magnitude is small... Following that, there are numerous gardens here. Therefore, he may be less than once every two months. Everything is depending. However, we can contact him in any way."

(Informant 1)

"The promotion is already there, it's just that the response from us is important... The youth is not interested if you count. Difficult."

(Informant 1)

"What type of training do residents participate in? After that, what is the department's support like... not sufficient..."

(Informant 4)

"The input is considered not enough…top up by our own…".

(Informant 3)

"Currently the disease is spreading. For example, fruit flies... We only employ one method. We use biological agents."

(Informant 7)

"....I have been in agriculture for 3 and a half years now. Enter 4 years. Ok, I see that there were many problems. Ok to succeed.. Want to bring capital return.. return.. with disease. Sorry to say... to Consultants .. to Teachers who teach .. to Ministries .. All are talking about profit. RM Per Kilo Per Ton RM... the reality is not same.."

(Informant 5)

4.3.3 Improvement Needs for Urban Agriculture Program (UAP) (Section C)

Considering the challenges faced by participants in the UAP, as highlighted in the previous section, several areas of improvements are warranted, as requested by the participants of UAP (Table 4.9). The highest percentage of respondents indicated that “there is a need for continuous agricultural guidance and advice from all parties” with 10.4%, while 10.2% cited “Agricultural courses should be given free of charge by various parties,” followed by “Farm equipment, fertilizer, and seeds for the garden should be provided by a specific sponsor (e.g., water pump, etc.)” (9.7%), “Giving additional incentives to gardeners” (8.6%), “Incentives in the form of smart agricultural technology and equipment should be given to farmers under UAP” (7.8%), “The involvement of the private sector and NGOs is needed to advance UAP” (7.4%), “Agriculture product marketing assistance should be implemented by agricultural agencies” (6.6%), “UAP promotion needs to be improved” (6.5%), “There is a need for continuous monitoring from agricultural agencies and various parties” (6.5%), “UAP should be made one of the agro-tourism locations for the community” (5.8%), “The number and area of urban gardens in the surrounding area should be increased” (5.2%), “Agricultural Extension Officers who are committed and friendly with program participants are needed” (5.0%), “The application process to work on UAP needs to be simplified (e.g., faster land approval time, etc.)” (4.6%), and “More Agricultural Extension Officers need to be assigned for the smoothness of UAP” (4.3%). Other reasons for program improvement accounted for 1.8%.

Table 4.9: Improvement needs of UAP

Description	Frequency (n)	Percentage (%)
1. Agricultural courses should be given free of charge by various parties.	127	10.2
2. There is a need for continuous agricultural guidance and advice from all parties.	130	10.4
3. Farm equipment, fertilizer, and seeds for the garden should be provided by a specific sponsor (e.g., water pump, etc.).	121	9.7
4. The number and area of urban gardens in the surrounding area should be increased.	65	5.2
5. Giving additional incentives to gardeners.	107	8.6
6. More Agricultural Extension Officers need to be assigned for the smoothness of UAP.	54	4.3
7. UAP promotion needs to be improved.	81	6.5
8. Incentives in the form of smart agricultural technology and equipment should be given to farmers under UAP.	97	7.8
9. The application process to work on UAP needs to be simplified (e.g., faster land approval time, etc.).	57	4.6
10. There is a need for continuous monitoring from agricultural agencies and various parties.	81	6.5
11. Agricultural Extension Officers who are committed and friendly with program participants are needed.	62	5.0
12. UAP should be made one of the agro-tourism locations for the community.	72	5.8
13. The involvement of the private sector and NGOs is needed to advance UAP.	92	7.4
14. Agriculture product marketing assistance should be implemented by agricultural agencies.	82	6.6
15. Others	23	1.8

Qualitative findings further provide support, with the respondents citing the need for area expansion for the community garden, particularly from highly enthusiastic participants who had hoped to further expand their planting area if given the opportunity to do so. The respondents to the poll also expressed a desire for initiatives from a variety of stakeholders to assist people learn more about urban agriculture. Several participants expressed a need for knowledge, and an external network of diverse parties was required for them to get information for the sake of the long-term viability of urban community gardens. Access to knowledge and networking with diverse parties were identified as crucial for the long-term sustainability of urban community gardens.

Participants also emphasized the importance of obtaining management approval to expand planting areas and expressed interest in opportunities for further education and collaboration with agricultural organizations and NGOs. Additionally, some participants shared their experiences of seeking out information through various channels such as social networking platforms, free courses, and formal education in agriculture. In the words of some of the participants appealing for improvements:

"*What we need beside other is just about the area if it can be expanded further. We are here depending on the management. We cannot use any area freely. We depend on the management permission. If the management approve so we could expand our area for planting.*"

(Informant 7)

"*Aaa indeed there is...I have a request with agriculture. If we can join the fertigation class.... Indeed, we are welcome cooperation with NGOs and other organizations etc...*"

(Informant 1)

"Yes, most of them can now be found on any social networking platform. As a result, we also request that agricultural parties conduct free courses. Yes. I frequently collaborate with outside organizations. I suggested several non-profit organizations..."

(Informant 2)

"Yes, my nephew I tell him to study agriculture. That one is now taking a course, if I'm not mistaken, he's also in agriculture were, in Kuantan if I'm not mistaken. He just said. He entered that course and graduated from UiTM. After that he said he wanted to continue studying agriculture again."

(Informant 3)

"We studied on YouTube and traveled all the way to Perak to study plant science".

(Informant 4)

4.3.4 Research Objective 1: To evaluate the level of Context, Input, Process, Product and Program Effectiveness dimensions (Section B)

To address the first research objective, a complete set of survey items were used, comprising eleven (11) items to assess Contextual aspects, ten (10) items to assess

Input, and ten (10) items each to evaluate the Process, appraise the Product, and measure Program Effectiveness. This diversified set of items facilitated a detailed evaluation of numerous characteristics within the research framework.

1) **Context Evaluation:** Evaluating the level of effectiveness of Context dimension in terms of suitability of UAP objectives and goals.

Table 4.10 presents the statistics for eleven measurement items of the construct "Context evaluation" of UAP evaluation. Almost half of the program participants (49.6%) agreed that "The purpose of UAP is relevant to create harmonious and prosperous community relations" (Mean = 4.43, SD = .578).

This result is followed by more than half of the program participants (58.7%) agreeing that "The objective of UAP is in line with the program's direction, which is to create social interaction in the community" (Mean = 4.36, SD = .548). The participants felt the societal impacts and effects on community cohesion and engagement. The statement indicates that UAP direction has created and provided social interactions among the community, with the participants feeling more connected with each other (Veen et al., 2016). Indeed, several studies have shown that urban farming strengthens the ties between communities (Sharp et al., 2022; Peemoeller, 2011; Napawan, 2014).

In contrast, the item with the fewest contributions to measure Context evaluation on UAP is "The purpose of UAP is very suitable to reduce the import of agricultural products from foreign countries" (Mean = 4.12, SD = .711). This result reflects the economic reality that certain crops, such as carrot, broccoli, cauliflower, potatoes are much cheaper if imported from China (FAMA, 2016). Overall, the total mean value of 2.97 with a standard deviation .159 indicates that the Context evaluation dimension is rated as a high level.

Table 4.10: Respondents' Context evaluation of UAP

Items-Context Evaluation	Percentage (%)					Mean	SD
	1	2	3	4	5		
1. The purpose of UAP is relevant to create harmonious and prosperous community relations.	0.0	0.4	3.0	49.6	47.0	4.43	0.578
2. The objective of UAP is in line with the program's direction, which is to create social interaction in the community.	0.0	0.4	2.2	58.7	38.7	4.36	0.548
3. The objective of UAP is suitable to help in creating community farming activities that produce quality and safe food.	0.0	0.0	2.6	61.3	36.1	4.33	0.525
4. The purpose of UAP is suitable to instill the interest of citizens in cultivating crops.	0.0	0.9	3.0	58.3	37.8	4.33	0.579
5. The purpose of UAP is relevant to advancing the Malaysian agriculture sector.	0.0	0.4	2.6	61.7	35.2	4.32	0.544
6. The purpose of UAP is relevant in implementing the production of sustainable food sources.	0.0	0.0	4.3	63.5	32.2	4.28	0.538
7. The purpose of UAP is suitable to improve the economy of the participant's household.	0.0	1.7	7.8	56.1	34.3	4.23	0.663

Table 4.10: Continued

Items-Context Evaluation	Percentage (%)					Mean	SD
	1	2	3	4	5		
8. The purpose of UAP is very relevant to support the guarantee of food supply (sufficient, easy access, availability of food, and others) at the household level.	0.0	0.0	8.3	62.6	29.1	4.21	0.576
9. The objective of UAP is suitable to help in creating community farming activities that produce enough food for families.	0.4	1.7	10.9	57.8	29.1	4.13	0.702
10. The objective of UAP is suitable to help in reducing the living cost among urban gardeners.	0.0	1.7	8.7	65.7	23.9	4.12	0.619
11. The purpose of UAP is very suitable to reduce the import of agricultural products from foreign countries.	0.4	0.	14.8	54.3	29.6	4.12	0.711
Overall						**4.26**	**.598**

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderate, 4 = Agree, 5 = Strongly Agree. SD = Standard Deviation.

Table 4.11 demonstrates that 97.4% of the respondents expressed a high degree of agreement with the program **Context** of UAP developed by the DOA. The overall mean value 4.26 (SD = .598) revealed that almost all the participants agreed with the relevance of the program context (objective and goals).

Table 4.11: Mean level of respondents' Context Evaluation of UAP

Level of Context	Frequency	Percentage (%)	Mean	SD
Low (1.00 – 2.32)	0	0.0	4.26	0.598
Moderate (2.33 – 3.65)	0	2.6		
High (3.66 – 5.00)	224	97.4		

This is in line with Stufflebeam (2002), who define context evaluation as an assessment of the needs, problems, opportunities, and problems that can be addressed in a particular environment. The responses from participants indicated that the program design, in terms of its contextual relevance, was both engaging and effective in addressing their needs. This is aligns with the fundamental purpose of evaluation, which emphasizes ensuring that planning processes are efficient and appropriately directed, particularly when they are tailored to local contexts (Nation & Macalister, 2010).

Qualitative data illuminate key factors influencing participant involvement in the urban agricultural program from the perspective of context evaluation. A significant number expressed a shared aspiration to deepen their knowledge of farming practices, which served as a catalyst for engagement in community gardens and subsequent active participant in the city's UAP. Informants have reported:

"Really interested"

(Informant 1)

"Of course, because of I interested"

(Informant 2)

"My first reason to join is because my interest in gardening".

(Informant 5)

"My own interest. We get an allocation of RM50 000 a year from Jabatan Kebajikan Masyarakat... So, what do we use that for, we share it with those involved...."

(Informant 9)

"*Because I also have some knowledge in that area. I've also taken agricultural foundation classes. However, there was no land... So that's where my desire to participate in urban farming comes in."*

(Informant 2)

However, when assessing the success of a program, the organizers must set clear objectives and refrain from exceeding the participants' expectations. Therefore, within this context assessment, evaluation plays a role in influencing the program's aims and objectives by encouraging community engagement in urban agriculture initiatives.

2) **Input Evaluation:** Evaluating the level of effectiveness of the Input dimension in terms of course and training contents, incentives (equipment and finance), advisory services, exhibitions, and demonstrations provided in extension activities among UAP participants.

Table 4.12 presents the percentage, mean and standard deviation for ten of the measurement items of the construct “Input evaluation” of UAP. More than half of the program participants (60.9%) agreed that “Incentives and assistance were provided to the program participants to start garden activities (e.g., financial, seeds, kits, fertilizers, etc.)” (Mean = 4.30, SD = .548). This highlights the positive reception of the input dimension, suggesting that the resources provided by the Department of Agriculture were adequate and instrumental in supporting the participants.

In contrast, the item with the fewest contributions to measure Input evaluation on UAP is “Virtual and face-to-face exhibitions have been implemented to make it easier for program participants to obtain information about agriculture” (Mean = 3.85, SD = .948). The participants reported that these extension activities platforms (virtual and face-to-face exhibitions) lacked both in quality and quantity, resulting in challenges for them to obtain information. This highlights a gap in the effectiveness of extension activities, particularly in their role as accessible information channels for program participants. Thus, improvements to the input dimension are imperative to address these shortcomings. According to Ridzwan et al. (2018), preliminary actions in the form of strategic improvements are essential for refining current decision-making processes. By identifying and rectifying weaknesses, the input assessment can serve as a framework for optimizing current strategies, ensuring better alignment with planning objectives and operational procedures. Furthermore, an effective input evaluation has the potential to identify pathways for more success-oriented applications, strengthening the program's overall impact.

Table 4.12: Respondents' Input evaluation of UAP

	Items-Input Evaluation	%					Mean	SD
		1	2	3	4	5		
1.	Incentives and assistance were provided to the program participants to start garden activities (e.g., finance, seeds, kits, fertilizers, etc.).	0.0	0.0	4.3	60.9	34.8	4.30	0.548
2.	Active and highly committed Agricultural Extension Officers are assigned to provide guidance to program participants.	0.0	.4	4.8	58.7	36.1	4.30	0.579
3.	Agricultural Extension Officers skilled in communication are assigned to discuss the crop problems program participants faced.	0.0	1.3	3.0	60.4	35.2	4.30	0.591
4.	Experienced and knowledgeable Agricultural Extension Officers are assigned to assist program participants.	0.4	2.2	3.0	59.1	35.2	4.27	0.664
5.	Extension services are provided continuously to the program participants to help them to solve crop problems.	0.0	0.4	6.5	63.9	29.1	4.22	0.573
6.	Urban agriculture training/courses have been organized to explain the theoretical knowledge and techniques related to crops, to the program participants.	1.3	3.5	5.7	59.6	30.0	4.13	0.773

Table 4.12: Continued

	Items-Input Evaluation	%					Mean	SD
		1	2	3	4	5		
7.	Demonstrations of agricultural methods have been shown to help the program participants in mastering the skills and knowledge of agriculture.	0.9	3.5	6.1	63.0	26.5	4.11	0.731
8.	Appropriate technological facilities have been provided to assist the program participants.	0.0	3.5	6.1	73.0	17.4	4.04	0.611
9.	Exhibitions related to agriculture were given to instill the interest of program participants in farming.	3.5	7.8	10.4	52.2	26.1	3.90	0.992
10.	Virtual and face-to-face exhibitions have been implemented to make it easier for program participants to obtain information about agriculture.	3.0	7.0	14.3	53.5	22.2	3.85	0.948
	Overall						**4.142**	**0.701**

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderate, 4 = Agree, 5 = Strongly Agree.
SD = Standard Deviation.

Table 4.13 demonstrates that 86.1% of the respondents strongly agreed with the program **Input** of UAP developed by the DOA. The overall mean value of 4.142 (SD = .701) indicate that the UAP has a well-balanced quality of course support, incentive resources (such as equipment and financial assistance), extension services, exhibitions and demonstrations integrated into the extension activities.

Table 4.13: Mean level of respondents' Input evaluation of UAP

Level of Input	Frequency	Percentage (%)	Mean	SD
Low (1.00 – 2.32)	1	0.4		
Moderate (2.33 – 3.65)	31	13.5	4.142	0.701
High (3.66 – 5.00)	198	86.1		

This is consistent with Stufflebeam (2002) framework, which emphasizes that input evaluation focuses on assessing the resources that are already in place for achieving goals and meeting needs. Research has shown that the main purpose of input evaluation is to assess and identify different program strategies for attaining different objectives and to provide such information that assists in the usage of strategies. As a result, it is important to concentrate on the personnel, resources, processes, and decisions that shape and refine program goals.

Qualitative data further revealed mixed perspectives on input evaluation. Some respondents noted a lack of monitoring activities from agricultural officer, indicating potential gaps in oversight. However, a subset of participants expressed positive experiences, reporting assistance from their respective state's DOA as well as the possibility to begin a project involving urban agriculture. According to the informants:

"Monthly observation... It's simply that the magnitude is small... Following that, there are numerous gardens here. Therefore, he may be less than once every two months. Everything is depending. However, we can contact him in any way."

(Informant 1)

"Less participation among residents, Besides, support from the department is also not... satisfactory".

(Informant 4)

"Some non-agricultural organizations, such as the Perpaduan, are more proactive in their support of agricultural endeavors, in contrast to the agricultural organizations themselves, which do not take the initiative to provide assistance for agricultural endeavors..."

(Informant 4)

"*PAWE is an activity center for the elderly, was established on the 11th April 2018 under the department of Ministry of Women and Community Development... we also got help from the state agriculture department... They personally offered to help because they saw that we have a foundation.... Then start from there they begin to give for modern agricultural inputs. So apart from the use of this land, we use the fertigation method on this land.".*

(Informant 9)

"*We use our own capital at first. After that when introduced by Adun...he said agriculture has a course for this is urban agriculture. Let's join it. After that when there is an opportunity for this community to plant this fertigation. I also accepted the challenge... Take it to plan chillies."*

(Informant 3)

"In the beginning, they used to give chillies, they gave fertilizer, then it was seed, the seed given is vegetable seeds, and not for chillies. Ha, appropriate. When he gave me the fertilizer, I asked him, can this fertilizer be used to make chillies? He said OK. That's what I did."

(Informant 3)

"*Advisory services are given. Advisory services in terms of the needs of agriculture items, and like teaching from him (extension agent). It's like those husks, fertilizer husks, that's AB fertilizer."*

(Informant 7)

Assessing the input of an UAP requires the organizers a meticulous planning to ensure the content of technology delivery, the competence of extension agricultural agents, and the provision of quality agricultural facilities. These inputs are designed to enhance participants' knowledge, skills, attitudes, and practices related to urban gardening. Therefore, thorough research is essential in the planning of every aspect to prevent any implementation that contradicts the program participants' requirements.

Consequently, the input of the UAP aligns with the agricultural program's demands, shaping participants' adoption of good agricultural practices. This includes disseminating information on the dissemination of knowledge related to effective agricultural techniques and delivering agricultural technology for the sustainable implementation of urban gardening activities.

3) **Process Evaluation:** Evaluating the level of effectiveness of Process dimension in terms of implementation in achieving program objectives.

Table 4.14 presents the percentage, mean and standard deviation for the ten measurement items of the construct “Process evaluation” of UAP. More than half of the respondents (63.0%) agreed that “Agricultural Extension Officers always recommend planting methods to help participants to improve crop performance” (Mean = 4.26, SD = .562). The main goal of process evaluation is to provide detailed descriptions of a program's activities (Stufflebeam, 1971). The findings suggest that extension officers were successful in imparting agricultural knowledge to program participants. This is consistent with the purpose of agricultural extension workers, which is to assist farmers in sharing knowledge, gaining experience, and achieving outcomes that are anticipated to improve and inspire creativity in farmers than before (Retno et al., 2021). This indicator shows that UAP participants find extension workers’ roles to be appropriate and acceptable.

However, the item with the fewest contributions to measure Process evaluation on UAP is “Agricultural Extension Officers have explained the concept and method of producing downstream products from crops” (Mean = 3.86, SD = 1.003). Based on the observations and interviews, a few participants have mentioned they received limited information on producing downstream products from urban agriculture yields. The findings demonstrated that the knowledge and technology on downstream production has not yet been fully transferred by agricultural extension workers to the UAP’s participants.

Table 4.14: Respondents' Process evaluation of UAP

No.	Items-Process Evaluation	%					Mean	SD
		1	2	3	4	5		
1.	Agricultural extension officers always recommend planting methods to help participants to improve crop performance.	0.0	0.4	4.8	63.0	31.7	4.26	0.562
2.	Agricultural extension officers always give clear feedback to help the participants understand agriculture-related matters.	0.0	0.4	5.7	61.3	32.6	4.26	0.577
3.	Agricultural extension officers recommend the type of technology and crops that are suitable for the characteristics of the garden area.	0.4	3.0	4.3	61.7	30.4	4.19	0.690
4.	Agricultural extension officers always encourage participants to practice sustainable agriculture.	0.0	1.3	6.5	65.7	26.5	4.17	.595
5.	Agricultural extension officers always carry out UAP activities with participants through various methods. (e.g., social media or face-to-face).	0.4	1.3	8.7	62.2	27.4	4.15	0.657
6.	Agricultural extension officers always involve the participants during agricultural methods demonstrations.	0.4	3.0	4.3	61.7	30.4	4.19	0.690
7.	DOA and certain parties are often involved in monitoring to ensure that UAP activities run smoothly.	0.0	1.7	10.0	64.3	23.9	4.10	0.632
8.	Agricultural Extension Officers always plan the community garden activities to ensure UAP run well.	0.4	3.5	7.8	62.6	25.7	4.10	0.711

Table 4.14: Continued

No.	Items-Process Evaluation	%					Mean	SD
		1	2	3	4	5		
9.	Agricultural Extension Officers monitor the farm records of participants periodically to evaluate their performance.	0.4	2.2	9.6	65.2	22.6	4.07	0.667
10.	Agricultural Extension Officers have explained the concept and method of producing downstream products from crops.	3.0	10.0	10.0	52.2	24.8	3.86	1.003
	Overall						**4.135**	**0.678**

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderate, 4 = Agree, 5 = Strongly Agree. SD = Standard Deviation.

Table 4.15 demonstrates that 85.7% of the respondents expressed strong agreement with the program **Process** on UAP developed by DOA. The overall mean value for process evaluation is 4.135 (SD = .678). In the context of agricultural extension program evaluation, process evaluation refers to the types of activities carried out by agriculture extension agents in delivering the knowledge and technical advices to the program participants.

Table 4.15: Mean level of respondents' Process evaluation of UAP

Level of Process	Frequency	Percentage (%)	Mean	SD
Low (1.00 – 2.32)	01	0.4		
Moderate (2.33 – 3.65)	32	13.9	4.135	0.678
High (3.66 – 5.00)	197	85.7		

The conclusion drawn from this study provided insights into the process evaluation information regarding the effectiveness of implementation in achieving UAP goals. The result showed that the overall mean value of the process dimension ranked the second lowest after the Product evaluation dimension. Implementation strategy, technical guidance provided, and method used to provide services to participants all fell under the process dimension. Since the participants are not actual farmers, it has turned out to be one of the most challenging aspects for agricultural extension workers. This divergence from the typical farmer profile meant that participants required not only knowledge and skills but also access to technologies that would engage and sustain their participation in the UAP.

Some qualitative findings have shown that the initiation of the urban agricultural community garden project occurs when participants have access to undeveloped land suitable for cultivation. The DOA plays a pivotal role by designating the location of the community garden as a model planting site. This information was gleaned from several different sources. Several qualitative insights regarding the implementation of the community garden project emerged from those who participated in the UAP. A significant finding is that many urban garden activities are carried out as a result of consensus among members of the surrounding community. The dedication shown by members of the community to one another ensures that the activities associated with the garden operate smoothly and can be administered effectively. There were a few informants who mentioned:

"*Because there is an empty land... Then it happened that a program of urban agriculture is opened, we applied to the agriculture office… before we plant the seedlings, we have to ploughing the soil first, then we call people from the AJK surau here to help."*

(Informant 6)

"The Department of National Unity (PERPADUAN) has talked to the Director of Agriculture. They want to make this concept (urban agriculture) ... here do it first. When we do it first, for example, that's why many people come, many people look at this urban community garden... We do it first. The meaning of the DOA as the chairman of the neighboring pillar... this kind of relationship is like a coincidence, right. So, they want to see we start first. So no matter what, Taman Sepadu all agree to be an example for others. That's a reason why lot of people come here, right..."

(Informant 8)

"We have our own team. Every afternoon, that afternoon, people voluntarily attend to work."

(Informant 1)

"Every two days we will meet, what should we do, what should we help. Ah… Aa... so this group will do this, this group will do this. So, we have aa... what people say aa…commitment and cooperation in a team."

(Informant 2)

“There are about 14 to 15 of urban community garden members... However, they do take turns. Still, there are two permanent individuals. Because we give an allowance to them.”

(Informant 9)

“Indeed, there are now activities. Every Tuesday there is an Islamic studies class, followed by... Here, on Wednesdays and Fridays, the seniors participate in chair exercises. Therefore, when people visit, we utilize the occasion to give... We provide some insight into what we do and what we’ve accomplished in urban agriculture.”

(Informant 9)

Based on these insights, it becomes clear that organizers should execute a well-structured and systematic program. The engagement of participants, the delivery of technology, and the provision of agricultural guidance must be guided by a methodology that aligns closely with the participants’ needs. The key to establishing a successful and efficient program lies in adopting a straightforward, well-planned, systematic, and creative process strategy. This approach aims to facilitate and attract participants of all ages and backgrounds, ensuring their active and continuous involvement.

4) **Product Evaluation:** Evaluating the level of effectiveness of the Product dimension in terms of the achievement of program objectives.

Table 4.16 shows the percentage, mean and standard deviation for the ten measurement items of the construct “Product evaluation” of UAP evaluation. More than half of the respondents (63.5%) agreed that “My relationship with my fellow gardeners became closer after participating in UAP” (mean = 4.32, SD = .513). This is an illustration of how engaging in urban agriculture activities with neighbors can help people feel more comfortable and connected to one another. They engaged in the activities, which resulted in interaction and communication. Indeed, a healthy lifestyle, healthy communities, a healthy environment, enjoyable eating, and a sustainable future are all benefits of program participation (Lyson et al., 2008). Additionally, several studies have revealed a positive correlation between urban agriculture and residents’ physical and mental health. According to Tracey (2016), community gardens can foster a sense of neighborhood community and cultural expression.

In contrast, the item with the fewest contributions to measure Product evaluation on UAP is “I have successfully earned a side income through UAP” (Mean = 3.74, SD = .972). This finding is incongruent with the core objectives of UAP, which aims to alleviate the cost of living in urban and sub-urban areas by encouraging the communities to grow food crops for personal use, with any surplus sold as a potential source of income. However, based on the interviews and observations, the income generated from vegetables sale is not considered as personal income, but rather income for their community garden.

Table 4.16: Respondents' Product Evaluation of UAP

No.	Items-Product Evaluation	%					Mean	SD
		1	2	3	4	5		
1.	My relationship with my fellow gardeners became closer after participating in UAP.	0.0	0.0	2.2	63.5	34.3	4.32	0.513
2.	I am more concerned and easier to do charity after participating in UAP.	0.0	0.4	3.9	60.9	34.8	4.30	0.562
3.	My health improved after participating in UAP.	0.4	0.0	6.1	61.3	32.2	4.25	0.602
4.	I become easier to communicate with the gardeners about agricultural activities after participating in UAP.	0.0	0.4	5.2	66.1	28.3	4.22	0.552
5.	I have managed to reduce the amount of household spending on buying vegetables after participating in UAP.	1.7	1.7	6.5	55.7	34.3	4.19	0.775
6.	I understand more about the method to produce crops that are safe to eat.	0.4	0.9	4.3	69.1	25.2	4.18	0.582
7.	I can teach my friends again about the agricultural knowledge gained through participation in UAP.	0.0	2.2	13.0	60.4	24.3	4.07	0.677
8.	I have mastered managing vegetable expenses efficiently after participating in the program.	1.3	6.1	17.8	52.2	22.6	3.89	0.869

Table 4.16: Continued

No.	Items-Product Evaluation	%					Mean	SD
		1	2	3	4	5		
9.	I understand the method of producing downstream products from crops after participating in the program.	4.8	8.7	7.8	56.5	22.2	3.83	1.026
10.	I have successfully earned a side income through UAP.	3.0	8.3	20.4	48.3	20.0	3.74	0.972
Overall							**4.099**	**0.713**

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderate, 4 = Agree, 5 = Strongly Agree.
SD = Standard Deviation

Table 4.17 demonstrates that 85.7% of the respondents involved in urban agriculture strongly agreed with the program outcomes of the UAP introduced by the DOA. The overall mean value of 4.099 (SD = .713) indicates that almost all participants experienced positive outcomes throughout the program. The findings suggest that several key factors, such as conducive environment, the availability of appropriate resources, relevant content, proper and effective technology transfer, and the use of various extension methodologies and strategies all have a significant impact on shaping the participants' skills, attitudes, and behavior.

Table 4.17: Mean Level of Respondents' Product Evaluation of UAP

Level of Product	Frequency	Percentage (%)	Mean	SD
Low (1.00 – 2.32)	0	0		
Moderate (2.33 – 3.65)	33	14.3	4.099	0.713
High (3.66 – 5.00)	197	85.7		

The qualitative findings further corroborated the quantitative findings on the positive impact of urban farming programs on participants. Most respondents stated that they were able to cut costs associated with household expenses. They also highlighted that the program helped them to understand the concept of urban agriculture with minimal expense. This suggests that the program effectively facilitated learning without requiring significant expenditures just to gain knowledge about urban gardening. According to the statements of some sources:

"*Now we consume a lot for ourselves. Not for sale… can reduce the cost of kitchen expenses…"*

(Informant 1)

"As for now the yield we gain is quite little but so far the produce is sufficient for us."

(Informant 2)

"If we have extra, we will sell the yield to the residents *with a low price. That's one of our objectives..."*

(Informant 4)

"There's a lot of salad. At first, I didn't sell it, I gave it free to others. We gave to residents for many bags of salad…"

(Informant 6)

"Getting involved in UAP is incredibly beneficial...If not, we will have to go outside, and it will be very expensive for us to learn all of these things..."

(Informant 1)

"We here in Penang... we're quite satisfied because we get knowledge...."

(Informant 9)

Hence, during the product assessment, it is crucial for the organizers to ensure that the participants of the UAP, with appropriate guidance, experience significant improvements in their performance. This process should facilitate transformations across various dimensions, including mindset, practical abilities, expertise, knowledge, and overall well-being. The creation of community urban gardens provides individuals with the opportunity to cultivate their own nutritious and secure food crops. This practice not only reduces the financial burden associated with purchasing vegetables but also contributes to improved health, strengthens community ties, and fosters several other beneficial outcomes.

5) **Program Effectiveness:** Evaluating the level of Program Effectiveness dimension in terms of program outcome for the UAP's overall impact.

Table 4.18 presents the percentage, mean and standard deviation for ten measurement items of the construct "Effectiveness evaluation" of UAP. More than half of the respondents (65.2%) agreed that "UAP has increased the access of the population to food crop sources" (mean = 4.24, SD = .538). Since taking part in the UAP, it has been claimed that the respondents and the local community can easily obtain sources of food crops. This case was similar in Hanoi, Vietnam (a developing country), where 80% of fresh vegetables and 40% of eggs are produced by urban and peri-urban agriculture (Claire, 2013). Urban agriculture offers the urban poor a reliable source of nutrient-rich food that would otherwise be unavailable, making it especially beneficial to them, particularly since slum dwellers often have limited access to fresh fruits and vegetables.

Table 4.18: Respondents' Program Effectiveness evaluation of UAP

No.	Items-Effectiveness Evaluation	%					Mean	SD
		1	2	3	4	5		
1.	UAP has increased the access of the population to food crop sources.	0.0	0.0	5.2	65.2	29.6	4.24	0.538
2.	UAP has successfully applied sustainable farming practices that are safe for the environment (e.g., avoiding soil erosion, water pollution and others).	0.0	0.4	7.4	62.2	30.0	4.22	0.588
3.	UAP becomes more systematically through the monitoring of agency (e.g. urban garden management).	0.0	0.0	6.5	68.7	24.8	4.18	0.530
4.	Efforts of the government and various parties to help in food security at the household level have been achieved through UAP.	0.0	1.7	7.8	61.3	29.1	4.18	0.640
5.	UAP has given early exposure to agricultural education to the youth to participate in the agriculture field.	0.0	0.4	10.0	62.6	27.0	4.16	0.602
6.	UAP has increased the agricultural production in the city (e.g., increased urban garden production).	0.0	0.0	11.3	61.3	27.4	4.16	0.602
7.	UAP has been successfully promoted and recognized by various parties and age groups.	0.4	1.7	8.7	62.2	27.0	4.13	0.670
8.	UAP has increased in terms of number (e.g. the number of urban gardens).	0.0	0.0	11.7	66.1	22.2	4.10	0.574

Table 4.18: Continued

No.	Items-Effectiveness Evaluation	%					Mean	SD
		1	2	3	4	5		
9.	UAP has opened an opportunity for a local citizen to become a successful farm entrepreneur.	0.0	2.2	14.8	58.7	24.3	4.05	0.691
10.	Program participants understand the concept of crops and downstream products introduced by the DOA and agricultural agencies.	2.6	8.3	8.3	59.6	21.3	3.89	0.923
	Overall						**4.131**	**0.636**

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderate, 4 = Agree, 5 = Strongly Agree. SD = Standard Deviation

More than half (62.2%) of the respondents agreed that "UAP has successfully applied sustainable farming practices that are safe for the environment (e.g., avoiding soil erosion, water pollution and others)" (mean = 4.22, SD = .588). This result affirms the idea that community gardening in urban areas is valued for its environmentally conscious methods. Respondents' engagement in these practices illustrates their commitment to preserving natural resources and reducing ecological damage. Urban farmers also benefit not only by protecting the environment but also by accessing healthier, self-grown food and promoting the long-term viability of their crops. The study by Maxwell (1995) further substantiates these claims, demonstrating that households that engaged in urban agriculture had greater food security, ate more meals, retained a balanced diet throughout the year even during periods when resources were limited. Importantly, these practices contributed to improved health and nutrition for children.

In contrast, the item with the fewest contributions to measure effectiveness of the program is "Program participants understand the concept of crops and downstream products introduced by the DOA and agricultural agencies" (mean = 3.89, SD = .923). More than half of the respondents (59.6%) agreed that they understand the concept of crops and downstream products introduced by the DOA. This finding suggests that while some understanding is present, the remains a gap in the program's overall impact, specifically in terms of practical application of these concepts.

To bridge this gap, community garden participants should be encouraged to apply their understanding of downstream products derived from urban agriculture yields to address the economic inefficiencies often associated with urban agriculture, which is primarily due to its high cost. In a world where food security is less assured and food prices are rising, urban agriculture has the potential to become more economically viable (Claire, 2013).

Table 4.19 demonstrates that 89.1% of the respondents in UAP strongly agreed with the program's effectiveness. The overall mean value of 4.131 (SD=.636) indicates a high level of UAP effectiveness. Almost all of the participants have rated the UAP as success because they have been actively involved and engaged in the community garden activities regardless of their needs and problem faced. To improve the efficacy of this program, a number of strategic and innovative actions must be taken.

Table 4.19: Mean level of respondents' Program Effectiveness evaluation of UAP

Level of Effectiveness Evaluation	Frequency (n)	Percentage (%)	Mean	SD
Low (1.00 – 2.32)	0	0.0		
Moderate (2.33 – 3.65)	25	10.9	4.131	0.636
High (3.66 – 5.00)	205	89.1		

To summarize the results, the findings indicate that individuals who actively engage in good urban agricultural practices and sustained them experience positive outcomes across various aspects of life, including their well-being, environment, food security, and economy stability. The study also indicates that the long-term productivity and viability of urban farming in the future depends on a number of factors. Educating urban farmers on sustainable farming practices and methods, as well as crop contamination prevention techniques is imperative to ensure the enduring productivity of their agricultural efforts.

Developing nations, in particular, demonstrate significant potential for urban agricultural production due to their high participation rate. If properly supported and regulated, urban agriculture could offer a workable solution to the food security challenges faced by rapidly growing cities. The following qualitative findings demonstrate that community garden crops can boost the popularity of homegrown food and even contribute to household earnings of urban farmers. A small number of sources reported:

"The yield and success have already occurred. The eggplant yield is not consumed due to surplus… and I have supplied to the Datuk Ali's restaurant. If you collect twice, you can obtain between 10 and 12 kilograms. Therefore, we send it there as a result of our product."

(Informant 2)

"The profit from the farm is not for personal income. The inputs in term of fertilizer, facilities like piping systems all were given once, then we will do it by our own. Thus, we will get the yield profit at the end. The average profit we get a day is around RM100 to RM150 in sales..."

(Informant 9)

"Yes..when we enter the UAP by implementing the community garden, we get a satisfaction with what we do…because the whole life is just the same…The fertilizer is enough according to the system instead we just sow the fertilizer manually. Aaa...So with this fertigation system. The schedule of fertilizer is around five minutes, ten minutes, twenty minutes. We get this information from the agricultural agencies…"

(Informant 6)

The qualitative evidence provided by participants in community gardening confirms the program's effectiveness. Not only has there been a rise in the demand for locally farmed food, but urban farmers have also reported improved financial gains. Participants highlighted high crop yields, and the effective use of surplus produce for commercial sale, illustrating both the program's practical benefits and its deeper influence on agricultural practices and everyday life.

To summarize, the Urban Agriculture Program (UAP) has successfully achieved its goals, as evidenced by the favorable feedback from those involved. Although there are areas that could be enhanced, the program's overall effectiveness is apparent in its positive impact on food security, promotion of sustainable agricultural practices, and generation of economic advantages for both participants and communities.

4.3.5 Research Objective 2:

(a) To determine the relationship between Context, Input, Process, Product towards Program Effectiveness of UAP.

(b) To develop a framework for improving UAP implementation.

With the evaluation of UAP achievement across the CIPPE dimensions completed, the next phase involves an in-depth analysis of the structural model. The purpose of the analysis is to determine the model's prediction capabilities and to elucidate the association between the constructs. The analysis began examining the structural model that included model validation, the significance and relevance of the structural relationships, as well as assessment of the R^2, effects size (f^2), and predictive relevance (Q^2). The following subsections will discuss each component of the evaluation, highlighting their outcomes and implications.

Partial Least Squares Structural Equation Modeling (PLS-SEM)

The Partial Least Squares Structural Equation Modeling (PLS-SEM) is a second-generation tool that can be used for examining the relationship between latent variables and their indicators. PLS-SEM has two phases: 1) the reflective measurement model assessment, and 2) structural model assessment.

1) Model Validation: Reflective Measurement Model

Confirmatory factor analysis is commonly used to address issues of consistency and validity. The measurement model was examined to evaluate the significance of the latent variables and their indicators. It should achieve three main criteria of internal consistency (Cronbach alpha and composite reliability), convergent validity (individual indicator reliability and AVE), and discriminant validity (Heterotrait-Monotrait Ratio and cross loadings) (Ramayah et al., 2018; Hair et al., 2016).

a) Indicator Reliability and Internal Consistency

Internal consistency is the degree of homogeneity between multiple items in the same construct measured by comparing the sum of latent variable factor loadings to the sum of factor loadings plus error variance (Werts, Linn, & Joreskog, 1974). The item of each variable was examined based on the factor loadings to achieve indicator reliability. The factor loading must be greater than 0.708 in order to be deemed as reliable. This demonstrates that a latent variable can account for at least 50% of the variance of the indicator (Hair et al., 2017); otherwise, the item will be removed from the analysis. Table 4.20 shows the retention of all items (variables: Context, Input, Process, Product, and Program Effectiveness) because the loading values were greater than 0.708. In accordance with the recommendation by Gefen, Straub, and Boudreau (2000), composite reliability was assessed to determine internal consistency. Nunnally and Bernstein (1994) recommended that the proposed composite reliability threshold value be greater than 0.6 but not greater than 0.95. The composite reliability for all constructs ranged from 0.846 to 0.92, which are regarded as satisfactory values.

Table 4.20: Cronbach's Alpha and composite reliability

Variables	Cronbach's Alpha	Composite Reliability
Context	0.811	0.864
Input	0.889	0.910
Process	0.897	0.915
Product	0.771	0.846
Effectiveness	0.851	0.887

b) Convergent Validity

Convergent validity is the extent to which one item is positively associated with other items of the same variables. AVE is used to measure convergent validity. According to Hair et al. (2017), the researchers must ensure that the outer loading value is greater than 0.708. When this value of 0.708 is squared, it equals the value of 0.5, which represents the average variance extracted (AVE). To obtain the 0.5 value, which represents at least 50% of the variance of each item, the outer loading value between 0.40 and 0.70 should be removed to increase the AVE value. As stated by Fornell and Larcker (1980) and Hair et al. (2009), they recommend the benchmark values for Cronbach alpha, composite reliability and AVE as 0.7, 0.708 and 0.5, respectively. All AVE scores of the latent variables in this study were between 0.51 and 0.53. Thus, it can be concluded that the convergent validity was accomplished for all constructs (Table 4.21).

Table 4.21: Average Variance Extracted of Variables (AVE)

Variables	Average Variance Extracted (AVE)
Context	0.514
Input	0.507
Process	0.521
Product	0.524
Effectiveness	0.529

c) Discriminant Validity

A reflective construct in the PLS path model must demonstrate the strongest relationships with its own indicators, which is confirmed through a discriminant validity assessment (Hair et al., 2022). The discriminant validity of the model was assessed using two criteria: Cross-Loading and HTMT. As shown in Table 4.22, the indicator loadings for the designated construct were higher than those of other constructs. This indicates that the model has no loading or cross-loading problems. Further, none of the values exceeded the necessary thresholds of HTMT .85 (Kline, 2011) and HTMT .90 (Gold et al., 2001), indicating that the HTMT criteria were satisfied, as shown in Table 4.23. Given that all criteria met the required thresholds, these findings confirm that discriminant validity was successfully achieved.

Table 4.22: Cross loadings of variables

Items	Context	Input	Process	Product	Effectiveness
A11	0.668	0.382	0.381	0.339	0.411
A2	0.735	0.475	0.376	0.395	0.481
A5	0.756	0.408	0.337	0.394	0.478
A6	0.719	0.435	0.402	0.299	0.448
A8	0.699	0.438	0.419	0.441	0.466
A9	0.722	0.380	0.324	0.343	0.388
B1	0.355	0.627	0.451	0.339	0.360
B10	0.457	0.771	0.639	0.542	0.550
B2	0.277	0.493	0.361	0.364	0.431
B3	0.384	0.653	0.538	0.430	0.471
B4	0.422	0.778	0.618	0.448	0.564
B5	0.457	0.756	0.560	0.394	0.532
B6	0.386	0.718	0.561	0.317	0.400
B7	0.431	0.687	0.546	0.383	0.476
B8	0.489	0.792	0.587	0.406	0.542

Table 4.22: Continued

Items	Context	Input	Process	Product	Effectiveness
B9	0.480	0.789	0.630	0.546	0.595
C1	0.363	0.559	0.727	0.422	0.472
C10	0.266	0.441	0.634	0.385	0.499
C2	0.452	0.607	0.654	0.437	0.417
C3	0.418	0.616	0.786	0.440	0.487
C4	0.420	0.604	0.795	0.530	0.573
C5	0.407	0.565	0.740	0.517	0.531
C6	0.287	0.428	0.632	0.337	0.413
C7	0.411	0.580	0.691	0.380	0.521
C8	0.343	0.576	0.776	0.387	0.504
C9	0.390	0.627	0.756	0.557	0.592
D10	0.334	0.339	0.367	0.758	0.501
D3	0.436	0.577	0.590	0.653	0.504
D4	0.316	0.418	0.404	0.696	0.486
D7	0.394	0.460	0.401	0.763	0.527
D9	0.382	0.356	0.461	0.743	0.518
E10	0.487	0.525	0.508	0.500	0.705
E2	0.448	0.489	0.499	0.539	0.725
E3	0.395	0.548	0.573	0.477	0.738
E5	0.532	0.587	0.575	0.518	0.796
E7	0.485	0.488	0.538	0.536	0.758
E8	0.427	0.486	0.422	0.560	0.730

Table 4.23: Heterotrait-Monotrait Ratio

	Context	Input	Process	Product	Effectiveness
Context					
Input	0.686				
Process	0.612	0.869			
Product	0.649	0.712	0.734		
Effectiveness	0.753	0.805	0.802	0.875	

2) Structural Equation Model

The assessment of structural equation model consists of five criteria, namely the assessment of collinearity issues, path coefficients (t-value, p-value, and confidence interval), coefficient of determination (R^2), effect size (f^2), and predictive relevance of the structural model (Q^2). Additionally, the results of the PLS-SEM analysis were extended using the Importance-Performance Matrix Analysis (IPMA). The following section presents an in-depth description of the analysis outcomes.

a) Hypotheses Testing

A total of four hypotheses were tested, each examining the direct relationships among the Context, Input, Process, Product, and Effectiveness dimensions. PLS-SEM analysis was employed as the analytical method to test the hypotheses.

The relationship between the dimensions of Context, Input, Process, and Product with the Effectiveness variable among participants of UAP

Table 4.24 shows that all four hypotheses were supported, with t-values ≥ 1.645, thus significant at 0.05 level of significance. Specifically, the predictors of Context dimension ($\beta = 0.217$, $p < 0.05$), Input dimension ($\beta = 0.200$, $p < 0.05$), Process dimension ($\beta = 0.228$, $p < 0.05$), and Product dimension ($\beta = 0.330$, $p < 0.05$) have positive and significant relationships with the Effectiveness of the Program. The significance level for the path coefficients should achieve at least 0.05 (Hair et al., 2017). Therefore, H1, H2, H3, H4 are supported.

Table 4.24: Results of Path Coefficient

Hypotheses	Relationship	Std Beta (β)	t-value	p-value	Decision
H1a	Context → Effectiveness	0.217	4.147	0.000	Supported
H2a	Input → Effectiveness	0.200	2.600	0.010	Supported
H3a	Process → Effectiveness	0.228	2.905	0.004	Supported
H4a	Product → Effectiveness	0.330	4.717	0.000	Supported

b) Coefficient of Determination (R^2)

The coefficient of determination (R^2) is calculated to determine the accuracy of model prediction by estimating the proportion of the dependent variable's variance that is accounted by changes in the independent variables. The R^2 value determines the expected level of accuracy. The higher the value of R^2, the higher the expected level of accuracy. According to Hair et al. (2011), the rule of thumb for interpreting R^2 values is considered weak (0.25), moderate (0.50), and high predictive accuracy (0.75). Table 4.25 revealed the R square and Adjusted R square of the endogenous construct

(Effectiveness) explained by all the exogenous constructs (CIPP). The R^2 value of 0.668 indicates that 66.8% of the variance in CIPP can be explained by Effectiveness. This shows that the predictive accuracy of CIPP is moderate. R^2 values ought to be sufficient for the model to have at least some explanatory power (Urbach & Ahlemann, 2010). Falk and Miller (1992) suggest that for the variance explained of a particular endogenous construct to be deemed adequate, R^2 values should be equal to or greater than 0.10.

Table 4.25: R square and Adjusted R square Values of Variable

Construct/Indicator	R Square (R^2)	Adjusted R Square (*Adj.* R^2)
Effectiveness	0.668	0.662

c) Effect Size (f^2)

The f^2 assesses the relative impact of a predictor construct on an endogenous construct (Cohen et al., 2003). Table 4.26 shows the effect sizes of the respective endogenous variables. Cohen et al. (2003) determined that the effect sizes of 0.35, 0.15, and 0.02 correspond to large, medium, and small effects, respectively. The results revealed that all relationships achieved at least a small effect size (0.02), except for Product dimension with large effect size (0.81). The difference between R^2 with and without the inclusion of an exogenous construct is a clear indication of its significant contribution to explaining the endogenous construct, which will result in a high f^2 value (Ramayah et al., 2018).

Table 4.26: Result of Structural Model Assessment

Hypotheses	Relationship	f^2	Effect Size
H1a	Context → Effectiveness	0.087	Small effect
H2a	Input → Effectiveness	0.041	Small effect
H3a	Process → Effectiveness	0.056	Small effect
H4a	Product → Effectiveness	0.813	Large effect

d) Predictive Relevance (Q^2)

The predictive relevance (Q^2) value is calculated at the last part of the structural model assessment (Geisser, 1975; Stone, 1974). It is necessary to perform prediction relevance testing (Q^2) to demonstrate that the evaluated model makes pertinent predictions. The blindfolding procedure was used to assess predictive relevance (Q^2) (Henseler et al., 2009; Chin, 1998). When a dependent variable in a structural model has a Q^2 value greater than zero, the model's predictions are valid (Fornell & Cha, 1994). Table 4.27 shows that the Q^2 value of Effectiveness based on the blindfolding procedure is larger than zero, indicating a good predictive relevance.

Table 4.27: Predictive Relevance, Q2

Construct/Indicator	Q^2
Effectiveness	0.359

e) Importance-Performance Map Analysis (IPMA)

The Importance and Performance Matrix Analysis (IPMA) method is appropriate for extending the findings of the basic PLS-SEM outcomes using latent variable score (Hair, Hult, Ringle & Sarstedt, 2017). The goal of IPMA is to identify the predecessors with relatively high importance (structural model total effects) and relatively low performance (average values of the latent variable scores) for the target variables like Context, Input, Process and Product, to highlight the significant areas of the model that require attention.

Figure 4.2 and Table 4.28 depict the IPMA analysis assessment. According to the analysis, Product is the most important factor for increasing the level of UAP effectiveness because it has the highest total effect value (refer to Y-axis reading), followed by Context, Process, and Input. The analysis also indicated that, Process has the highest performance value when compared to Product, Input, and Context. As a result of the IPMA analysis, Product is the most important factor in increasing the effectiveness of the UAP, while Process is an additional force factor in increasing the effectiveness of program performance due to its high-performance level.

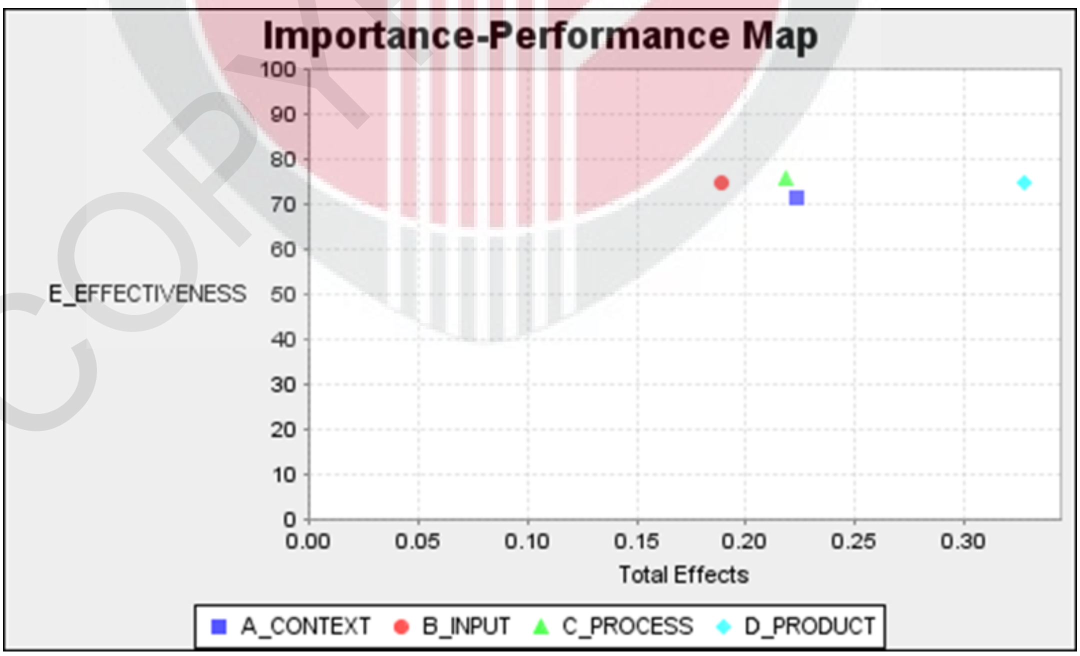

Figure 4.2: IPMA Analysis

Table 4.28: IPMA Result for Effectiveness

Variables	Importance (Total Effect)	Performance (Index Values)
Context	0.223	71.271
Input	0.189	74.660
Process	0.218	75.680
Product	0.327	74.961

3) UAP Implementation Improvement Framework

A summary of the analyses is presented and illustrated in Table 4.29, Figures 4.3 and 4.4. A detailed explanation of the findings of UAP evaluation across five dimensions of Context, Input, Process, Product, and Program Effectiveness is as follows:

Context (Relevance of UAP Objectives and Purpose)

The key elements that are retained include Security, Accessibility, Independence, Sustainability, Economy, and Progress, indicating that these themes are critical for achieving UAP goals. However, items such as Affordability, Engagement, Harmony, and Involvement were omitted, suggesting these aspects may have less relevance or impact on the structural model.

Input (Incentives Provided):

All elements under this dimension, including Technology, Incentives, Support, Training, Demonstrations, Exhibitions, Accessibility, Expertise, Communication, and Guidance, were retained. This highlights the comprehensive importance of these factors in the successful input and support of UAP.

Process (Implementation Process):

All items were retained, including Monitoring, Education, Planning, Recommendations, Sustainability, Evaluation, Participation, Technology, Implementation, and Feedback. This suggests that all aspects of the UAP implementation process are essential for its effectiveness.

Product (Impact and Changes on Participants):

The key elements like Management, Sharing, Communication, Charity, and Health were retained. However, Safety, Production, Savings, Income, and Relationships were omitted, implying that these may not have a significant impact on the participants according to the structural model.

Program Effectiveness (Impact and Changes on Overall Program):

Important elements retained include Sustainability, Education, Growth, Production, Security, and Promotion, indicating these are vital for the overall effectiveness of the UAP. Omitted items such as Entrepreneurship, Access, Management, and Understanding suggest these aspects are less influential in the model's final evaluation of program success.

Overall, the results indicate that the model prioritizes sustainability, growth, production, education, and security, while aspects like affordability, income, and relationships appear to have less relevance in the analyzed UAP framework.

Table 4.29: Summary of SEM Results

Dimension	Items	Element/Theme	Findings
Context (Relevance of UAP Objective and purpose)	A1-Living cost reduction through UAP	Affordability	Omitted
	A2-UAP for food security	Security	Retained
	A3-Safe and quality food production through UAP	Safe	Omitted
	A4-Promoting social interaction through UAP	Engagement	Omitted
Context (Relevance of UAP Objective and purpose)	A5-Household food security and accessibility	Accessibility	Retained
	A6-Reducing dependence on agricultural imports	Independence	Retained
	A7-Encouraging citizen participation in crop cultivation	Involvement	Omitted
	A8-Sustainable food source production	Sustainability	Retained
	A9-Improving household economy through UAP	Economy	Retained
	A10-Fostering harmonious and prosperous community relations	Harmony	Omitted
	A11-Advancing Malaysia's agricultural Sector	Progress	Retained
Input (Incentives provided)	B1-Provision of technological support for UAP	Technology	Retained
	B2-Incentives and resources for urban gardening	Incentives	Retained
	B3-Continuous extension services for crop problem-solving	Support	Retained
	B4-Training and theoretical education in UAP	Training	Retained

Table 4.29: Continued

Input (Incentives provided)	B5-Practical demonstrations of agricultural techniques	Demonstrations	Retained
	B6-Exhibitions to encourage interest in urban farming	Exhibitions	Retained
	B7-Accessible agricultural information through virtual and in-person exhibitions	Accessibility	Retained
	B8-Experienced Agricultural Extension Officers for participant support	Expertise	Retained
	B9-Skilled communication by Agricultural Extension Officers	Communication	Retained
	B10-Committed Guidance from Agricultural Extension Officers	Guidance	Retained
Process (Implementation process)	C1- Monitoring by the DOA for smooth UAP Operations	Monitoring	Retained
	C2-Education on downstream product production from crops	Education	Retained
	C3-Planning community garden activities for effective UAP implementation	Planning	Retained
	C4-Recommending planting methods for improved crop performance	Recommendations	Retained
	C5-Encouraging sustainable agriculture practices	Sustainability	Retained
	C6-Periodic monitoring of farm records for performance evaluation	Evaluation	Retained
	C7-Active participation in agricultural methods demonstrations.	Participation	Retained

Table 4.29: Continued

Process (Implementation process)	C8-Recommending appropriate technology and crops for garden areas	Technology	Retained
	C9-Conducting UAP Activities through various methods	Implementation	Retained
	C10-Providing clear feedback for better understanding of agriculture	Feedback	Retained
Product (Impact and changes on participants)	D1-Understanding safe crop production methods	Safety	Omitted
	D2-Learning to produce downstream agricultural products	Production	Omitted
	D3-Efficient management of vegetable expenses	Management	Retained
	D4-Sharing agricultural knowledge with others	Sharing	Retained
	D5-Reducing household spending on vegetables	Savings	Omitted
	D6-Earning additional income through UAP	Income	Omitted
	D7-Improved communication with fellow gardeners	Communication	Retained
	D8-Strengthened relationships with fellow gardeners	Relationships	Omitted
	D9-Increased involvement in charity after UAP	Charity	Retained
	D10-Health improvement through UAP participation	Health	Retained

Table 4.29: Continued

Program Effectiveness (Impact and changes on overall program)	E1-Opportunities for local community garden entrepreneurship through UAP	Entrepreneurship	Omitted
	E2-Application of sustainable and environmentally safe farming practices	Sustainability	Retained
	E3-Early exposure to agricultural education for youth	Education	Retained
	E4-Improved access to food crop sources	Access	Omitted
	E5-Growth in the number of urban gardens	Growth	Retained
	E6-Systematic management of UAP through agency monitoring	Management	Omitted
	E7-Increased agricultural production in urban areas	Production	Retained
	E8-Achieving household food security through collaborative efforts	Security	Retained
	E9-Understanding of crop and downstream product concepts	Understanding	Omitted
	E10-Recognition and promotion of UAP across various demographics	Promotion	Retained

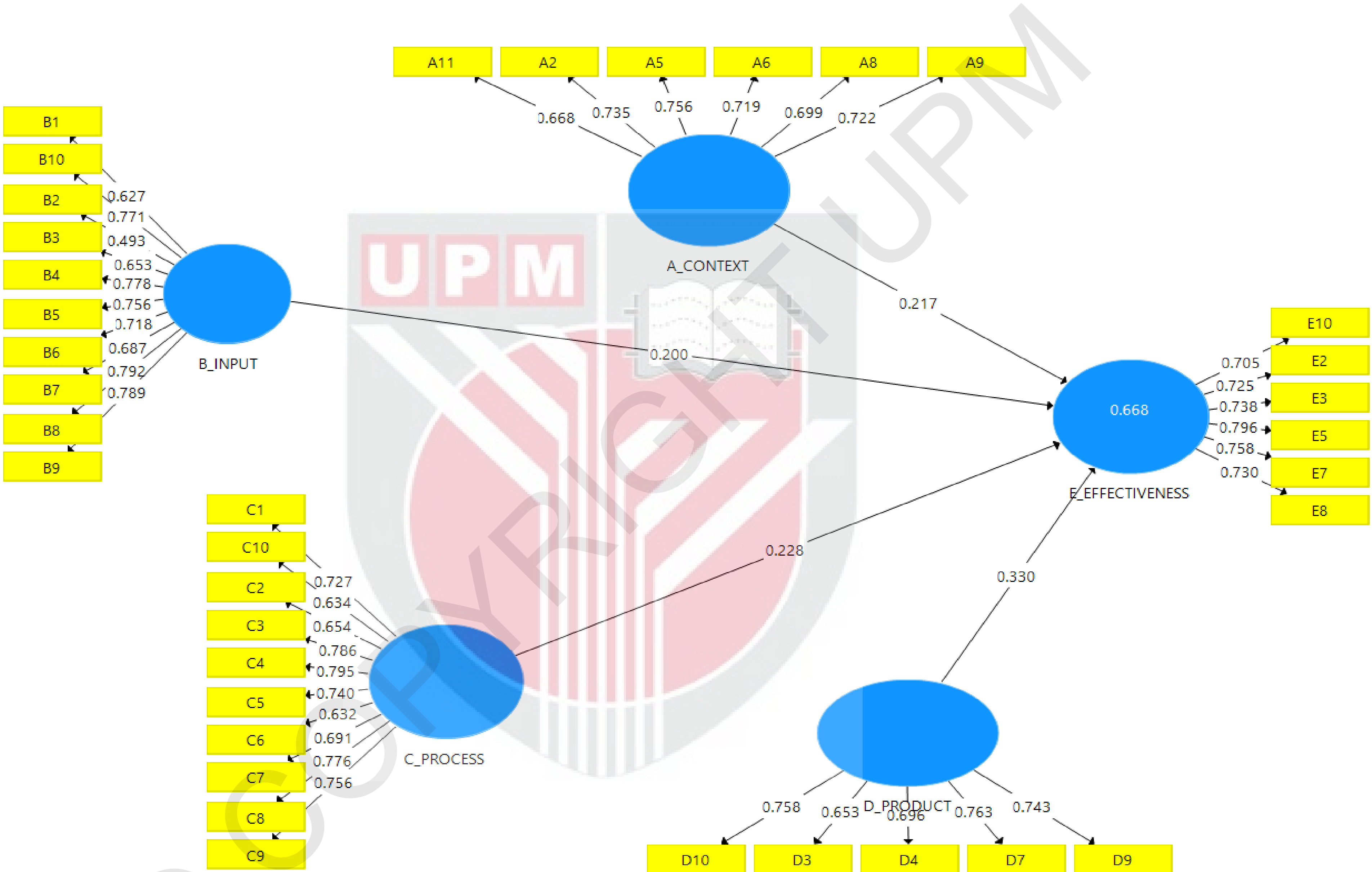

Figure 4.3: Findings of UAP Implementation Framework

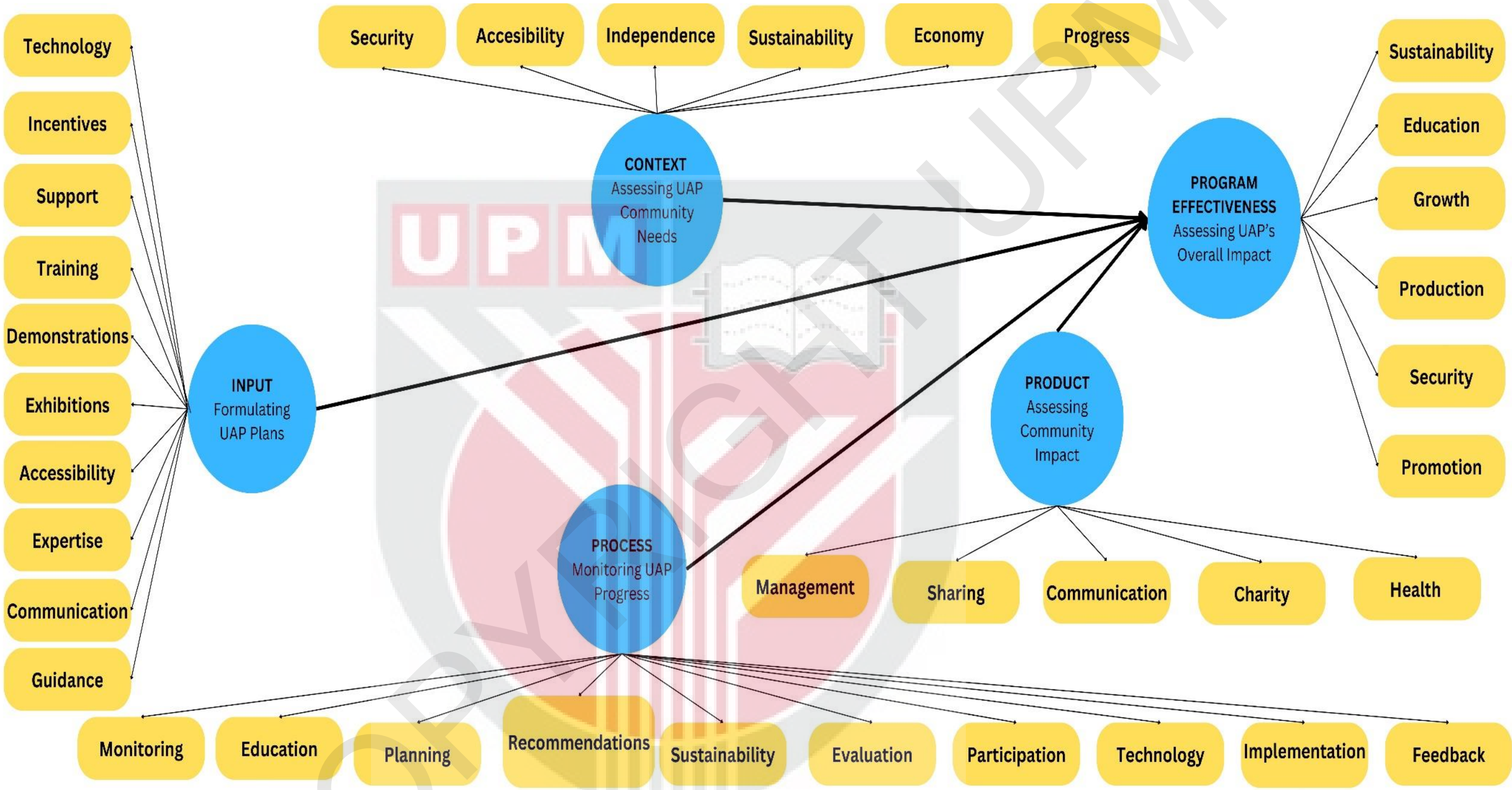

Figure 4.4: Recommendation for Improvement Framework of UAP Implementation

4.4 Respondents' Recommendations for UAP's Improvement

The qualitative findings revealed a number of suggestions put forward by program participants in the community urban gardening for making the program better. The suggestions offered are aimed at ensuring the continued viability of community gardens in the years to come. Among the key suggestions is the need for improved education on plant care and cultivation practices, which participants believe is essential for the continued success of the gardens. According to the source:

"Need to increase it more. Aa... currently we know there are many agricultural techniques…many models and systems. Before this, agriculture do not have fertigation system…. but now we have…

(Informant 1, Bandar Tun Razak Kuala Lumpur Community Garden)

"For plant we need seeds, fertilizer…. and advices… that's the most important. Because the main enemy of the plants is pest…"

(Informant 4, Jln Bachang Johor Bahru Community Garden)

"Haa, there's only one more thing that I'm waiting for that promised by the DOA to make this NFT (hydroponic) but not to use electricity but to use solar power.... Now we use electricity. So, this is his weakness if the electricity goes out it will not working. But until now, the allocation may not be available anymore, right? so we are waiting. When he gets the solar installed tomorrow, I want to see how he does it, then I want to do it myself. We learn from what the agriculture (DOA) gives."

(Informant 9, PAWE Pulau Pinang Community Garden)

Since most of the participants come from non-agricultural backgrounds, the need for providing additional instruction in basic and advanced planting techniques is highlighted, which they believed could significantly improve their success rates. Participants also expressed interest in learning about more advanced plant systems, such as solar power system as an alternative to electrical water pumping facilities.

Participants in the survey also recommended expanding training opportunities and monetary incentives to entice the younger age groups. By involving the younger generation, participants believe the agricultural sector can experience transformative growth, with youth serving as a catalyst for progress and innovation. The informants mentioned:

"The government should open any courses or training…or any special program for young generations…"

(Informant 4, Jln Bachang Johor Bahru Community Garden)

"Increase the incentives, for example before this they allocate RM10,000, so hope they can upgrade to 20k or 15k to expand the program… If possible, multiply more for agriculture in Terengganu… because Terengganu is one of the producers of agricultural products in Malaysia."

(Informant 3, Gong Penaga Terengganu Community Garden)

In addition, the participants aspire for increased external support to reduce the dependence on the governmental department. By providing additional activities besides agriculture, external agencies can increase urban agriculture's participation and activities. Participants mentioned:

"Because if it were 2021, I would have said I would only give 1," Now that I'm under MPPG, however, I'm extremely appreciative. This means that we need significantly more assistance from outside organizations. besides the DOA…"

(Informant 5, Jln Duku Johor Bahru Community Garden)

"In the future, if possible, if there is a DOA or other agencies, if possible, let's do for fish farming in cages, or canvas. It means apart from plants; we should have fish. It's just in our area. So, if possible, the meaning of that thing is expanded a lot more in terms of plants, livestock, aquaculture and yes regarding the needs of the kitchen we call it. I mean to use the area strictly, that also depends on the management. Our concern is tied to the management, if there are parties that can give flexibility to use areas for agriculture, especially fertigation. This is what we see as easy fertigation."

(Informant 7, PPR Hiliran Terengganu Community Garden)

Some participants also suggested increasing the budget for the provision of inputs of higher quality. Without high quality agricultural input, both the success of the community garden and the morale of its participants will suffer. The sources stated:

"Aah soil, black soil, fertilizer, seeds, tools. Then…hmmm…. everything is adequate"

(Informant 1, Bandar Tun Razak Kuala Lumpur Community Garden)

"Aa...at the initial stage we receive the water reservoir up to the piping, up to aa.. polybag. So there is a little aa... A&B fertilizer…aa… I think what is given is suitable for us..at our age.. to start... aa... this urban agriculture..."

(Informant 2, Setapak Kuala Lumpur Community Garden)

"Similar to Penang, 109 KRT exist. Nonetheless, all RM 6000. RM 2000 and RM 3000 funds. We simply use the funds provided by the government. For the program, we held a meeting and so on. KRT spend half money and so do the prayer hall. Sometimes, the KRT will do everything for the program..."

(Informant 8, Taman Sepadu Pulau Pinang Community Garden)

"If possible, I prefer to have something that covered my plants…it is easy to protect from pests…haaa… it called a greenhouse...if it is possible to provide from DOA. This is because of the green house is easy when it is raining or for farm cleaning"

(Informant 6, Kg Baghol Kemang Tiruk Terengganu Community Garden)

Overall, the qualitative findings indicate that respondents perceived the impact of the UA program positively and expressed confidence in its potential for long-term viability. At the same time, they offered constructive recommendations aimed at enhancing the overall quality of the program to ensure it remains effective and relevant in the future.

4.5 Discussion

4.5.1 Objective 1:

To evaluate the level of Context, Input, Process, Product and Program Effectiveness dimensions

The level of evaluation of the UAP was measured using four key dimensions: Context, Input, Process, and Product. Quantitative data revealed that the Context dimension had a high mean score (M = 4.26). The assessment focused on how well the program's objectives aligned with its broader purpose. The findings indicate that the program's goal and purpose of improving community harmony and well-being aligns closely with governmental efforts to encourage community involvement in urban agriculture to guarantee the sufficiency of the nation's food supply. The current finding is consistent with that of Ishak (2019), which affirmed that evaluating the Context dimension strengthens existing objectives aimed at driving meaningful change and is the first step in the evaluation process. However, past studies by Laverack and Labonte (2000) and Wahdy et al. (2017) pointed out a common shortfall, specifically the lack of public or community involvement during the planning stage.

An effective plan, one that prioritizes the needs and interests of the local community, could point the program during its execution to the right direction. According to Stufflebean (2002), the context dimension is crucial during the planning stage because it ensures that program requirements, issues, and opportunities are thoroughly addressed. Further supporting the present findings, Mokhtarzadegan et al. (2015) identified key obstacles to program performance often include neglecting the needs for assessment, as well as deficiencies in educational and welfare infrastructure. Similarly, Mahmoodi et al. (2012) and Yarmohammadian et al. (2011) highlighted needs assessment as the most significant shift in innovation for maintaining in-service training programs, which their findings revealed that implementation often fell short of expectations. Therefore, to ensure successful program outcomes, decision-makers and agricultural program developers must emphasize the importance of needs assessment, which is the first and most significant stage in any organization.

The Input dimension considers the resources that are already in place to achieve goals and meet needs (Stufflebeam, 2002). One of the input components is the achievement of UAP objectives, which includes participant engagement, facilities, equipment, and financial commitments. The evaluation phase of input dimension provides a guidance and informs the early stages in restructuring decisions and making adjustments that enhance efficiency while meeting both budgetary and procedural demands. In the context of this study, the respondents' contributions to the Input dimension reflected a high mean score (M = 4.142). These findings are consistent with those of Mokhtarzadegan (2015) and Hosseino et al. (2008), who discovered that the most important issues in the input component are allocating budget and educational resources, assessing the needs of training courses, and considering the staff's problems when selecting the subject and content of those courses.

A valuable practice highlighted in these studies is to use instructors from both within and outside the program. Such approach allows the program to benefit from insiders' understanding because they are familiar with the organization's difficulties, as well as outsiders' specialty and experience in specific disciplines. The study by Alkhatami

(2012), which similarly used the CIPP model to evaluate facilities and equipment in Saudi Arabia, emphasized the importance of the training environment and teacher competency as an effective controlling model.

The Process dimension encompasses the implementation strategy's perspective in accomplishing the UAP's goals. Implementation occurs as a central element of the program, in which the strategic objective could not be accomplished without the process (Rilwanu, 2014). One of the purposes of process dimension evaluation is to understand the journey of a program to accomplish positive and proud goals and objectives (Stufflebeam, 1971). In this study, process evaluation among respondents showed a high mean score (M = 4.135). This finding contradicted with Nazuri (2021) who reported a moderate level of implementation process among the community. Key factors integral to the process evaluation is pre-implementation planning and offering training courses that align with the employees' roles and educational backgrounds during their working hours. This is in line with the findings reported by Mahmoodi et al. (2010).

Meanwhile, Mokhtarzadegan et al. (2015) highlighted several obstacles during process evaluation, such as budget constraints, inadequate facilities for educational needs, insufficient educational contents, and limited time allocation. Additionally, elements like the methods used for goal introduction, effective teaching style, quality of educational tools, learners' motivation enhancement, the use of practical examples during teaching or demonstration and relatively up-to-date contents must also be taken into consideration and revision. This is supported by Tazakori et al. (2010), who emphasized the importance of holding practical courses, applying new training methods, reducing the number of participants in training sessions, and targeting learner-based training. Allocating enough time for each course and scheduling training sessions at convenient times were also found to be significant yet often overlooked.

For Product dimension, the respondents' overall product evaluation was relatively high, with a high mean score (M = 4.099). In particular, the respondents indicated that they attend the program primarily out of personal interest or as a hobby (35.2%). Interestingly, respondents reported an improvement in their relationships with fellow participants (M = 4.32). These positive outcomes stand in contrast to research by Akhlaghi and Yamammodian (2011) and Heidari et al. (2005), who found that evaluations of the product phase often fell short of expectations, pointing to certain issues.

Despite the generally positive feedback, a notable limitation of the UAP is the absence of official certification from the Department of Agriculture (DOA) for active participants. Those who wish to obtain certification must do so through a group initiative. Mokhtarzadegan et al. (2015) pointed out that the pursuit of educational certificates can be a double-edged sword, as many participants join the program with solely for the credential, which can undermine genuine involvement. In a study by Hosseinpour et al. (2012), motivators like a guaranteed certificate for work promotion and raises were identified as one of the training's weak points, potentially leading to low participation and ineffective program outcomes. As a result, a sustainable evaluation and identification of the programs' strong and weak points should be leveraged to raise the quality of program and ensure that participants are motivated by meaningful engagement rather than just external rewards.

4.5.2 Objective 2:

(a) To determine the relationship between Context, Input, Process, Product towards Program Effectiveness of UAP

The study's primary goal is to conduct both formative and summative evaluations of the implementation of UAP adopting the Stufflebeam's CIPP assessment model, a comprehensive framework for evaluating programs (Stufflebeam, 1971, 2003). The evaluation of the UAP's in this study was structured around examining the alignment of program objectives (Context), the resources and inputs provided (Input), the implementation strategies (Process), and the outcomes produced (Product). Elucidating the relationships between Context, Input, Process, and Product (CIPP) in evaluating the effectiveness of Urban Agriculture Programs (UAP) is crucial for understanding how these programs can be optimized to meet urban food security and sustainability goals. To achieve the study's objective, PLS-SEM was employed and the analysis outcomes contributed to the development of a framework for improving program implementation. This investigation has identified key elements that should be simplified and emphasized.

CONTEXT

The context dimension evaluation considers aspects such as fitting the objective to the program's purpose as perceived by UAP participants. In this regard, the findings show that the program's objective and purpose are consistent with the government's desire to expand the Malaysian agricultural sector, ensure the adequacy and security of the country's food supply, lower living costs, increase community involvement in planting, and promote the general well-being and harmony of the community.

According to Stufflebean (1970), the first step in program evaluation is to evaluate the contextual dimension of a program or activity. The goal here is to measure, translate, and confirm items relevant to the course of a program to establish the program's success or failure. The assessment also provides suggestions for making any modifications to refine present goals and objectives based on the assessment outcomes. It is an essential process as it lays the groundwork for continuous review and ensures that strategic decision align with the evolving needs and priorities of the program.

The findings from the PLS-SEM analysis indicate that factors related to items A1, A3, A4, A7, and A10 were omitted, while other factors retained (see Table 4.29). The hypothesis H1a, which investigates the relationship between 'Context' and 'Program effectiveness', was supported, with a β value of 0.217 and p-value <0.05. The questionnaire responses regarding the 'Context' dimension reveal that item (5) (refer to Table 4.29) shows that 61.7% of respondents agree that UAP is relevant in advancing the Malaysian agriculture sector, where Malaysia's global agricultural trade has peaked at $61.3 billion in 2022 with exports of $37.4 billion and imports of $23.9 billion (International Trade Administration, 2024). Moreover, 62.6% percent of participants agree that UAP is very relevant in guaranteeing food supply at the household level in efforts to maintain food security. This relevance is particularly significant given Malaysia's moderate score for hunger on the 2022 Global Hunger Index, up slightly from 10.9 in 2014 to 12.5 in 2022. These findings aligned with the view that UAP contribute as one of the solutions to address food crises in Malaysia (Mahmood et al., 2022).

Context evaluation involves assessing the environment in which urban agriculture programs are implemented, taking into account the program's objectives and the relevant policy frameworks. As urban agriculture gains recognition as an effective approach for boosting urban resilience and sustainability, it also serves as a catalyst for activating social, economic, and recreational networks while providing environmental benefits through urban greening and sustainable resource management (Casazza & Pianigiani, 2016). Additionally, Grochulska-Salak et al. (2021) suggest that the spatial configurations and management strategies applied in urban agriculture play a crucial role in shaping its ecological, social, and economic impacts. Thus, comprehending the contextual factors is critical for adapting urban agriculture initiatives to align with local needs and specific conditions.

To enhance the dynamics of the agriculture sector, the relevant regulatory bodies such as the DOA are responsible in reviewing current policies to support the growth of Malaysia's agricultural industry. In addition to policy updates, providing crop insurances can at subsidized rates could further protect the harvest and improve the profitability of the agricultural industry.

INPUT

When a program is being implemented, input evaluation is used to determine the suitability of various approaches, the distribution and use of technical inputs, their distribution and use, their monitoring and evaluation, and their transfer of technology. To make sure that the UAP's resources can be used to launch the program and produce results, evaluation of the use of inputs, technology transfer, and implementation techniques are crucial.

Based on the findings from the PLS-SEM analysis, all factors examined under the 'Input' element were retained (see Table 4.29). The hypothesis H2a investigating the relationship between 'Input' and 'Program effectiveness' is supported with a β value of 0.200 and p-value <0.05. The 'Input' component pertains to the knowledge, technology, and resources utilized in agricultural endeavors. The challenges that were found in the results are that 3.5% of participants reported lack of relevant training/courses to explain the theoretical knowledge and techniques related to crops, demonstrations of agricultural methods, and appropriate technological facilities provided to support their agricultural activities.

Moreover, 7.8% of respondents reported that there was also a lack of virtual or face-to-face exhibitions related to agriculture in instilling gardening interest among current or potential participants. Although a smaller percentage, 2.2% participants reported that they require experience and knowledgeable officers to assist program participants, which is in line with the data reported in Table 4.18, where 54 and 62 respondents stated there should more extension officers assigned to ensure the program goes smoothly and to commit to educate the participants, respectively. These may reduce the effectiveness of the UAP. On a positive note, 60.9% of respondents in item (1) shared that they were provided with incentives to acquire resources such as seeds and agriculture kits that enable farmers to maximize the use of resources like herbicides, fertilizers, and water.

Developing farmers' expertise and knowledge is an essential input. Farmers can be empowered to use creative ways by participating in training programs that emphasize technology utilization, sustainable farming methods, and modern farming techniques.

Efforts to increase capacity make sure that farmers have the know-how to overcome obstacles, education to adjust to emerging technology, and authority choose wisely when it comes to their farming methods (Dolinska & d'Aquino, 2016).

Input evaluation encompasses the resources, stakeholders, and planning necessary for effective program implementation. The effectiveness of UAP is often contingent upon the level of community participation and the resources allocated to these initiatives. Yusuf et al. (2021) note that low community engagement can hinder the success of UAP, which underscores the importance of involving local stakeholders in the planning and execution phases. Additionally, the role of government policies in facilitating urban agriculture is critical, as highlighted by Kim (2023), who emphasizes the need for supportive legislation and institutional frameworks to enable citizen participation in urban farming.

PROCESS

Process evaluation pertains to the methods and practices employed in the implementation of UAP. The implementation of the program's plan is connected to Process evaluation. To achieve the desired results, processes must be carried out effectively, which is why process evaluation is done. The process dimension considers the role of the implementation strategy in meeting UAP objectives.

Based on the findings from the PLS-SEM analysis, all factors examined under the 'Process' element were retained (see Table 4.29). The hypothesis H3a investigating the relationship between 'Process' and 'Program effectiveness' was supported, with a β value of 0.228 and p-value <0.05.

Insights on the ‘Process’ element revealed that agricultural extension officers monitor the farm records of participants periodically to evaluate their performance, with a score of 65.2% percent. Additionally, 65.7% of respondents reported a positive push by the agricultural extension officers in ensuring individuals are involved in sustainable agriculture practice, and 64.3% acknowledged the positive role of the DOA and other relevant bodies in encouraging and overseeing the UAP to ensure it runs smoothly. These findings show highlight the significance in ensuring the effectiveness of all activities happening under UAP as they are crucial in addressing the demands and queries of UAP participants to enhance the program.

Integrating sustainable methods is essential to enhancing Malaysia's agriculture process. This means using agricultural methods that reduce their negative effects on the environment, preserve resources, and support long-term ecological equilibrium. The DOA, agricultural extension officers or any relevant bodies can study and gradually implement new techniques like permaculture, agroecology (Hathaway, 2015), and organic farming to support soil health, biodiversity preservation, and a decrease in reliance on chemical inputs (Shah et al., 2013). This is to increase the sector's resistance to environmental difficulties and contribute to its overall sustainability by implementing sustainable approaches into their agricultural practices.

Effective processes are characterized by community involvement, educational initiatives, and the integration of technology. For instance, Diekmann et al. (2020) argue that localized urban food systems provide not only food but also social, educational, and civic benefits, which are essential for fostering community engagement and participation. Furthermore, the use of Information and

Communication Technology (ICT) in urban agriculture can enhance productivity and inclusivity, as demonstrated in the case study of Bengaluru (R, 2024). This suggests that a well-structured process that incorporates technology and community engagement is vital for the success of urban agriculture initiatives.

PRODUCT

Product Evaluation in this study aimed to identify the results or outcomes of a program that can be achieved, whether expected or not, in the short or long term. The assessment is based on the community's outcomes in terms of attitudes, knowledge, skills, practices, and health changes, among other things. The outcomes of the product evaluation will assist the evaluator in determining the success of the program in the community and deciding whether it should be continued or not. Several product outcomes (community outcomes) have been identified in the implementation of the UA program.

The PLS-SEM analysis revealed the omission of factors D1, D2, D5, D6, and D8, retaining the others (see Table 4.29). The hypothesis H4a investigating the relationship between 'Product' and 'Program effectiveness is supported with a β value of 0.330 and p-value <0.05.

The 'Product' component focuses on the observable effects and consequences of farming operations. In particular, 63.5 and 34.3% of participants reported closer community relationship through UAP, 60.4% reported successful transfer of agricultural knowledge through UAP, and 69.1% of respondents shared that they gained comprehensive knowledge on differentiating which crops are safe to eat and which are not. These findings highlight the contribution of UAP, particularly in mitigating food insecurity in Malaysia as more individuals are educated on urban farming. However, it is important to address the 4.8% of participants who expressed difficulty in understanding the processes involved in producing downstream products, even after participating in UAP.

Considering the lack of understanding on downstream products is a gap that needs closure, this correlates with the ‘input’ element where more diverse and holistic educational materials are provided. Furthermore, evaluating value-added products and supporting branding campaigns, also known as, ‘green marketing’ might improve Malaysian agricultural products’ overall competitiveness in the global marketplace which can also overcome one of the areas reported by the respondents to be improved, as presented in Table 4.9 under item (7) (Shibli et al., 2021). Stakeholders in the agriculture sector may contribute to a stronger and sustainable agricultural industry in Malaysia by concentrating on the product phase and making sure that the final outcomes correspond with societal, environmental, and economic goals.

The effectiveness of these programs can be measured through various indicators, such as increased food access and improved community health. According to Wang et al. (2021), urban agriculture can significantly contribute to food security, particularly in urban settings where traditional agricultural land is diminishing. Moreover, the social benefits of urban agriculture, such as enhanced community ties and increased consumption of fresh produce, are well-documented (Campbell & Rampold, 2021). The multifaceted nature of urban agriculture means that its products extend beyond mere food production to encompass broader social and economic impacts.

(b) Developing a framework for improving UAP implementation.

The objective of the study was to evaluate the UAP effectiveness and produce an improvement framework of UAP implementation by the Malaysian DOA using a modified conceptual framework of Ishak (2019), Razak (2018), and Yasin (2017).

Firstly, preliminary analysis was performed to ensure the normality of the distribution and to detect missing values and outliers, resulting in the exclusion of several responses from the dataset due to outliers. To achieve the first objective of the study, mean level analysis was performed based on using a complete set of survey items. Further, Partial Least Squares Structural Equation Modelling was employed to test the hypotheses and produce the improved model for UAP.

Two hundred and forty-two (242) were surveyed using questionnaire from August to February 2022. After the preliminary test, only two hundred and thirty (230) responses were selected for further analysis. Most of the respondents were married men between the ages of 50 and 59, have between 5-10 family members, attained a secondary level of education, self-employed earning between RM2001 and RM3000 per month, and had been involved in community garden activities for at least 2-3 years. The analysis revealed that all evaluated dimensions—Context, Input, Process, Product and Program effectiveness—achieved high mean scores based on respondents' perceptions. The structural model analysis demonstrated that Context, Input, Process, and Product each had a significant influence on Program Effectiveness. These findings informed the development of an improved implementation model, depicted in Figure 4.5, which highlights the significant pathways identified through the data analysis.

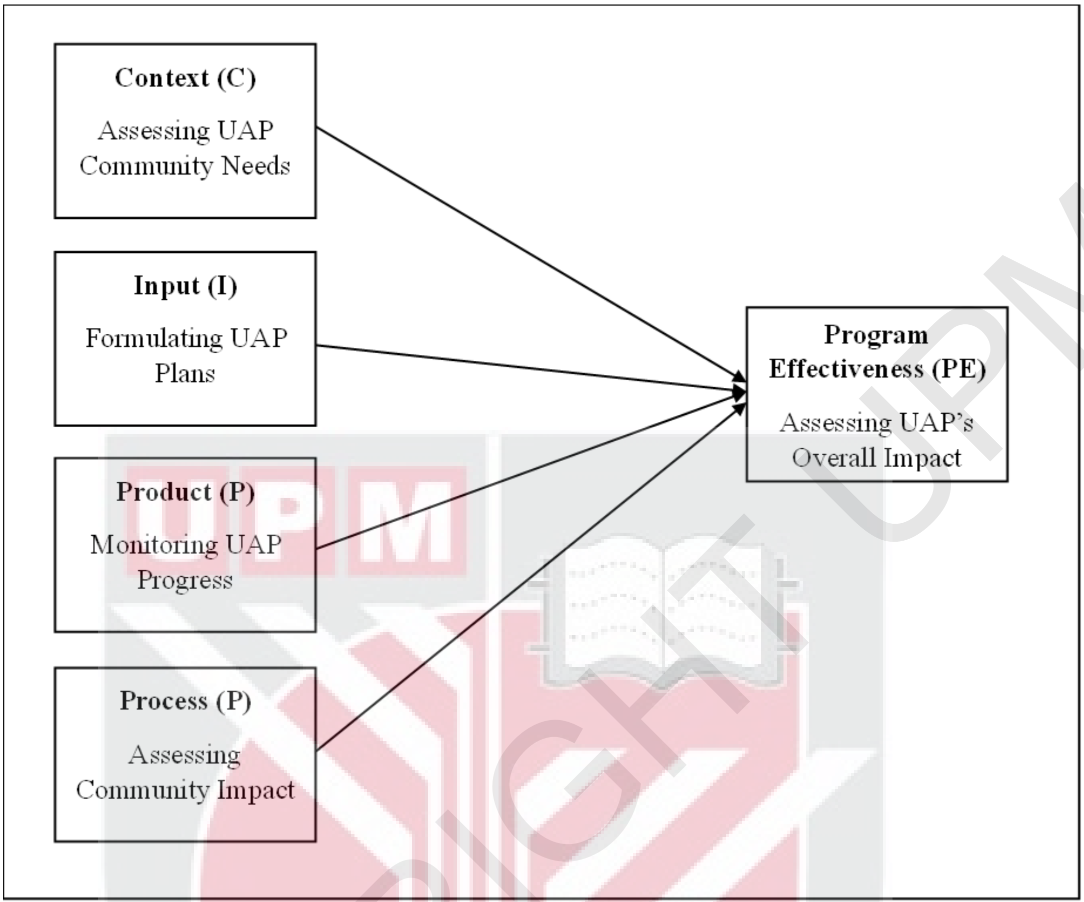

Figure 4.5: Model of UAP Implementation

In conclusion, the CIPP model provides a structured approach to evaluating the effectiveness of urban agriculture programs by examining the interplay between context, input, process, and product. Each component plays a critical role in shaping the outcomes of these initiatives, and understanding their relationships can lead to more effective urban agriculture strategies that address the complex challenges of urban food security and sustainability.

4.6 Summary

This chapter presented the analyses outcomes on UAP evaluation through the dimensions of context, input, process, product, and overall program effectiveness. Both descriptive and inferential analysis were employed as the analytical method, supplemented by qualitative insights obtained through interviews. In addition, the PLS-SEM was also employed to develop the improvement framework for UAP implementation. Although efforts to enhance the program have been made to ensure its relevance both present and the future, continuous improvements are essential. The analysis highlights the importance of sustaining and refining the program to increase youth involvement in urban agriculture and the broader agricultural sector—an essential step to ensuring adequate food supply.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter summarizes the study by highlighting key findings, contributions, implications, limitations, and research recommendations.

5.2 Conclusion

The Community Agricultural Development Program, also known as the Urban Agriculture Program (UAP), aids households in mitigating their cost of living by encouraging them to grow their own food. Since its initiation in 2006, the program has adapted its name over time to align with national regulations and contemporary circumstances, while maintaining its core objective of supporting urban agricultural activities. In Malaysia, the UAP's implementation supports the National Agro-Food Policy, aiming to ensure food security and reduce reliance on imported agricultural products. The Malaysian Department of Agriculture (DOA) effectively coordinates the UAP as part of broader urban development efforts. However, attracting young people's participation proved to be a challenge, which is still at a low level, and the program's continuity face several challenges. To decide how to improve the program, it is essential to conduct a comprehensive program evaluation to determine the program's strengths and weaknesses. Addressing these issues necessitates a thorough program evaluation to identify both strengths and areas for improvement. Such an assessment is crucial to optimize the government's investments and initiatives, ensuring they contribute effectively and are not wasted.

The CIPP Evaluation Model was used as the framework for a comprehensive evaluation of the UAP. The study's conceptual framework was modified from the works of Yasin (2017) and Ishak (2019) by incorporating the dimensions of Context, Input, Process, Product, and Effectiveness of the overall program. The model was originally derived from Stufflebeam (1983). Under the direction of the DOA, data were gathered from participants in urban gardening communities in four selected states: Georgetown, Penang; Kuala Lumpur, Kuala Terengganu, Terengganu; and Johor Bahru, Johor. Data was then subjected to rigorous analysis, including preliminary research, descriptive analysis, reliability analysis, partial least squares structural equation modelling (PLS-SEM). Based on these analyses, a framework for program improvement was subsequently proposed.

Study Objective 1: To evaluate the level of Context, Input, Process, Product and Program Effectiveness dimensions (Section B)

All the levels of Context, Input, Process, Product and Program effectiveness of UAP based on respondents' perceptions recorded a high mean score. Context dimension emerged as pivotal factor in program effectiveness, emphasizing that successful programs begin with thorough planning and well-defined program design. Such planning identifies needs, addresses problems, and recognizes opportunities within a specific setting. Descriptive analysis confirmed that each dimension—Context, Input, Process, Product and Program effectiveness—was highly rated by respondents.

According to Stufflebeam (1970), a program or activity that is better suited to the present and past environment must first undergo an examination of the context dimension. Issues, problems, and restrictions in the program's execution are all aspects of the context evaluation. The study's findings complement the government's stated goal of increasing food production of high quality and ensuring food security for the country. The DOA has actively supported community participation in the agricultural sector, as explained by Azima et al. (2013) research. This fits in with the role of the Malaysian DOA as coordinator of the UAP, which provides consistent direction and assistance to accomplish the agro-food policy's goals of ensuring food safety and limiting the need to import agricultural products. This study offers significant theoretical, methodological, and practical findings to the UAP effectiveness.

According to Bezu and Holden (2014), the agricultural sector is a nation's lifeblood and will continue to be an important part of the country's future. Their conclusion stems from the sector's ability to provide for the country's food demands. According to Zulkiply (2016), the agriculture industry provides employment for a significant portion of the population. The findings in this study underscored that there is a great impact of context, inputs and process on the product of the UAP participants. Document analysis revealed that the DOA has been effective in developing comprehensive plans aimed at involving urban dwellers to take part in urban agriculture activities by implementing different strategies with the help of hard-working administration, agricultural extension workers, DOA staff, and proactive community garden leaders. Moreover, participants in urban agriculture projects demonstrate notable dedication as they worked hard to implement and maintain their community garden by making their places producing healthy food in the city that can improve environment.

The study has also identified several negative aspects were also revealed, for example, participants felt they needed additional knowledge, technical guidance and extra infrastructure from agricultural extension workers and the agriculture department. The lack of support in this aspect places a huge pressure on participants, which affects their creativity and capabilities, particularly when the agriculture extension workers in charge are often reassigned or transferred. The participants also emphasized the need for more approachable and comfortable communication with extension workers to allow participants to share their urban agriculture problems.

The CIPP evaluation model helps in both internal/external evaluations. It also helps in evaluating the credibility and accountability of agriculture extension program and assists the evaluator and agriculture staff in decision making. Without Context, Input, Process, and Product Evaluation Model, it becomes difficult to identify and address the errors, weaknesses or strengths of the agriculture extension system, potentially undermining its effectiveness.

Study Objective 2: To determine the relationship between Context, Input, Process, Product towards Program Effectiveness of UAP.

The PLS-SEM indicated that Context, Input, Process and Product have significant influence on Program Effectiveness. Besides, all the CIPP variables factors have positive and significant effect on Effectiveness. The Context, Input, Process and

Product are playing the major factors influencing the overall of program effectiveness. Product variable was identified as the most important factor for increasing the level of UAP effectiveness, while Process had the highest performance value as the force factor in increasing the effectiveness of the program performance.

Studies have shown that the CIPP model is positively related to program effectiveness. In this study, the Context, Input, Process, and Product dimensions were shown to impact the effectiveness of the UAP, particularly when the participants felt satisfied and comfortable engaging in community gardening. These findings are consistent with Fatin (2019) and Syarifah (2017). However, this contrasts with the assertions made by James and Margaret (2012), who argued that participants' familiarity with the subject matter and their ability to apply what they have learned are fundamental to program effectiveness. Additionally, evaluating the input and process dimension are crucial phases in any of program. This could identify existing resources for attaining objectives and fulfilling needs and tracking the implementation process so that challenges issues emerged could be immediately overcome. According to Berry (2015), having the right infrastructure in place is crucial to the success of any agricultural program. This study supports that participants who are satisfied with the program are more likely to remain involve in the community garden program, a finding consistent with the observations of Leelanayagi (2018).

This research offers several recommendations aimed at improving the quality of agriculture program at the community level. The suggestions directed toward the Department of Agriculture (DOA), agricultural extension workers, and UAP participants include: 1) increase resource allocation (extension workers, farm equipment and infrastructure), as well as creating a friendly environment, broadening the dissemination of urban agriculture courses, ensuring effective communication and adopting a needs-based focus for all beneficiaries; 2) the use of CIPP model for assessing needs, formulated plans by using input evaluation, monitored progress using process evaluation and assessed impacts using product evaluation; 3) increase the number of qualified and well-trained agriculture personnel; 4) ensure that participants' needs and requirements are considered during the program design process; 5) establish a two-way channel of communication between agriculture management and urban agriculture participants; 6) revise techniques and developing advanced methods that cultivate creativity, thereby enhancing the quality of extension services; and 7) conduct regular assessments to ensure continuous improvement and the maintenance of high-quality urban agriculture programs at community level.

5.3 Study Contributions

Following the completion of the research, a number of positive contributions and implications surfaced within the Urban Agriculture Program (UAP). The study offers a comprehensive assessment of each dimension Context, Input, Process, Product, and Program Effectiveness of the Urban Agriculture Program (UAP). By evaluating the appropriateness of program objectives (Context), the quality of resources and support provided (Input), the effectiveness of implementation strategies (Process), and the overall impact on participants (Product), this research provides a multidimensional understanding of UAP's effectiveness. Such an evaluation contributes to identifying the strengths and weaknesses of each program component, enabling targeted recommendations for enhancing the program's efficiency and participant satisfaction.

This research establishes empirical relationships between the Context, Input, Process, and Product dimensions and their combined effect on Program Effectiveness. By determining how these dimensions influence each other, the study contributes to the literature on program evaluation by highlighting critical factors that drive the success or limitations of community-based programs like UAP. Understanding these relationships helps stakeholders focus on strategic areas that maximize program effectiveness.

The study contributes to the development of a framework aimed at improving the implementation of the UAP. This framework serves as a practical guide for program administrators and policymakers, providing structured recommendations for optimizing each dimension of the UAP. The framework can be adapted for similar community-based programs, making this study a valuable reference for enhancing the effectiveness and sustainability of agricultural extension programs.

Another contribution entails the development of a questionnaire instrument and semi-structured interviews, specifically designed for assessing the effectiveness of the UAP. In conjunction with this, the survey instrument is divided into three sections. Part A dives into the demographics of UAP participants, illuminating on the respondents' different characteristics. Meanwhile, Part B is related to the evaluation of the UAP based on the CIPPE evaluation. Section C discusses the participants' concerns and the need for improvement in the UAP. There is also an additional section of open-ended questions for the respondents to express their suggestion and comments. Similarly, the semi-structured interview instrument is divided into two parts: Part A, which covers the demographics of the participants, and Part B, which evaluates the UAP program using the CIPPE evaluation dimensions. However, there are just 19 questions in the semi-structured interview questions because the interview instrument only acts as supporting data. The primary data source is a questionnaire containing 53 items. Both instruments can also be used either before, during or after the UAP program is carried out. In fact, it can also be applied to any suitable program's evaluation procedure, not limited to the focus of program evaluation in the agricultural sector.

In addition, there is a contribution from a methodology point of view which is the application of Partial Least Squares Structural Equation Modeling (PLSE-SEM) as the data analysis technique, which is an improved, alternative method for investigating the relationship between independent and dependent variables compared to multiple regressions. The use of Importance-Performance Map Analysis (IPMA) in this research enables a holistic exploration of the relationship between exogenous variables and targeted endogenous variables. This gives a more complex evaluation on how socio-demographic characteristics, context, input, process, product, and program effectiveness are related and how they affect each other.

The findings from this research offer practical contributions to policy and practice by providing evidence-based insights that can guide the development and refinement of policies related to urban agriculture. Policymakers can use these insights to allocate resources more effectively, design targeted interventions, and make informed decisions to support community programs in urban settings.

The study enriches theoretical understanding with the application of a structured evaluation model to assess program effectiveness across multiple dimensions. It contributes to the academic discourse on program evaluation by demonstrating how a comprehensive evaluation approach can provide a deeper understanding of program dynamics and outcomes.

In connection with this, the significance of this study lies in its ability to ensure the adequacy of the country's food resources. One of the primary roles of the UAP is to safeguard both food sufficiency and safety in response to the escalating population of the country. According to research by Chaminuka et al. (2021), urban farming, or urban agriculture, is a feasible strategy to achieve sustainable development and is in line with the goals of domesticating the Sustainable Development Goals (SDGs). According to the research, urban agriculture has the potential to improve household health and well-being while also reducing poverty and hunger. Urban households that engage in these types of agricultural practices, however, confront several obstacles, such as a lack of suitable policies, a shortage of farming land, and insufficient farming inputs (such as pesticides, fertilizers, and crop seeds).

The research also highlights the dual nature of urban agriculture, illustrating how it can either mitigate or intensify poverty and starvation. Based on these findings, the report recommends that stakeholders, including local governments, support urban agriculture. Such support is regarded as critical for achieving sustainability in urban agriculture practices. This study concludes by highlighting the significance of its contribution, which includes significant insights for policymakers to improve the creation and execution of more successful policies.

Overall, this research contributes to both theory and practice by offering a detailed evaluation of UAP dimensions, establishing relationships between key program components, and developing a practical framework for enhancing program implementation and effectiveness.

5.4 Implications

5.4.1 Practical Implication

This study has a strong practical significance in contributing to the improved effectiveness of the Urban Agriculture Program (UAP). Given that 230 community members are actively participating in the UAP (DOA, 2021), understanding their perspectives and opinions on the program's impact is vital. Insights from this research can guide the Department of Agriculture (DOA) in identifying priority areas to maintain participant engagement. This, in turn, not only expands participants' knowledge of Urban Agriculture but also helps them reduce costs on fresh produce, which ultimately eases their overall cost of living.

5.4.2 Program Enhancement Implication

The research highlights that the program's context, the resources allocated, the processes used in implementation, and the resulting outcomes all significantly influence overall program success. Among these elements, the product's direct impact on participants was found to be the most critical driver of program efficiency. At the same time, stakeholders should not underestimate the significance of process-related factors, such as implementation strategies, in boosting program effectiveness. It is essential to devise strategies that foster participation and ensure long-term commitment to the UAP.

5.4.3 Policy Development

The study's results provide a solid foundation for shaping new policies and refining current initiatives. The findings offer valuable insights that can help the government address challenges related to community programs in urban settings. This may include allocating additional resources, offering technical support, and implementing capacity-building activities to maximize the UAP's efficiency.

5.4.4 Social and Community Impact

The research highlights the importance of community involvement and social capital in achieving program success. Stakeholders are encouraged to explore capacity-building activities that enhance social support and community bonds, which are crucial for maintaining participant interest. By understanding the social fabric of UAP communities, interventions can be customized to address participants' specific needs and motivations.

5.4.5 Methodology Implication

The approach adopted in this research, which integrates comprehensive evaluation tools to assess multiple program components (Context, Input, Process, and Product), can serve as a reference for future evaluations of similar community-based programs. The methodology can be tailored or expanded to include additional factors or demographic characteristics for a more detailed analysis of program impact.

5.4.6 Theoretical Implication

By analyzing the relationship between various program components and their influence on participant outcomes, this study enhances existing literature on program evaluation and community engagement. The results support the notion that a holistic evaluation framework considering both the product's impact and program effectiveness is essential for the success of community based programs.

In summary, this research provides critical insights for policymakers and practitioners to develop targeted strategies that enhance program engagement and ensure sustainable outcomes for the UAP and similar community initiatives.

5.5 Limitations of Current Research

The current study has identified several drawbacks. The first limitation was the category in which the participants of UAP were chosen, which is only at the community level. The findings may not be applicable to other categories of the UAP, such as individuals and institutions. In addition, this study was conducted with a focus only on community garden that was organized, received incentives and technical advice from the Malaysian DOA, and the involvement of participants from four capital cities of Penang, Kuala Lumpur, Terengganu, and Johor Bahru. As a result, the findings' generalizability is constrained. Another potential limitation is the use of structural equation modelling as an analytical technique. Unlike multiple linear regression, which can handle non-normal data distribution, SEM typically requires data to meet certain distribution assumptions. However, SEM was chosen for this research because of its capability to construct comprehensive models and examine intricate interactions between variables, providing deeper insights into the relationships. Furthermore, the lengthy questionnaire may cause respondents to feel apprehensive when submitting their responses.

5.6 Recommendations for Future Research

This research has real-world implications for enhancing the UAP, particularly in terms of its overall implementation. Therefore, some suggestions for future research can be implemented based on the study's findings and discussion. Some suggestions that can serve as a roadmap are as follows:

1) Additional research is required to monitor the current level of sustainability of all urban agriculture participants in community gardens. This is to determine the participants' vegetable consumption pattern and socio-economic status. With the study's findings and information, we can evaluate the economic viability of the

program in terms of reducing vegetable costs and generating supplemental income from community garden activities.

2) In-depth and extensive research on the knowledge, skills, and confidence of agricultural extension officers and agents in relation to the effectiveness of delivery and distribution of agricultural advisory services. The findings of this study enable stakeholders to formulate a strategy for the more effective and efficient delivery of agricultural technology and information.

3) Only residents of Peninsular Malaysia were included in the survey, and their participation was determined using a cluster sampling technique. Since Borneo is culturally and geographically distinct from Peninsular Malaysia, future research should consider including Sabah and Sarawak.

4) Future studies should focus on urban agriculture extension agents and officers who are directly involved with the UAP, using the 360-degree feedback method. This approach is particularly appropriate because these individuals possess extensive knowledge of various UAP aspects and they can offer creative ideas and identify essential new elements for sustaining the program now and in the future. The 360-degree feedback method will provide valuable insights, reveal potential areas for improvement, and guiding necessary changes to enhance the program’s effectiveness.

5) The assessment of program effectiveness can be conducted through alternative evaluation models, such as the CIRO model or the Kirkpatrick evaluation model. The CIRO model serves as a training evaluation framework specifically designed for

assessing the efficacy of management training courses. It encompasses four key dimensions: context, input, response, and outcome. On the other hand, the Kirkpatrick Model stands as an internationally recognized tool for evaluating and analyzing the outcomes of training and learning programs. This model comprises four stages of evaluation: reaction, learning, behavior, and decision. Progressing through each level of the model provides a more precise measure of the training program's effectiveness.

6) In future research, it is recommended to extend the analysis to include social impact assessments, as these are closely related to the dynamics of urban agriculture, particularly in the context of community gardens. This would provide deeper insights into how such initiatives influence social cohesion, community engagement, and local development.

To keep people motivated and to keep working hard in urban community gardens, this study demonstrates the need for increased government subsidies. According to the study's findings, program participants have responded positively to the initiative, with many expressing a desire for greater government support of urban agriculture in the form of increased subsidies for inputs like fertilizer, land, and labor. However, participants also wanted the government to provide an adequate number of agriculture officers. This is because the urban gardeners want consistent oversight from accountable agriculture officials so that they can fulfil their goals. It is believed that the participants still require consistent assistance and monitoring from agricultural authorities to successfully implement the solutions to their agricultural concerns. As for the remainder, it has been reported that the participants are pleased and would want to see such urban agriculture initiatives carried out in the future with increased funding and youth participation.

5.7 Conclusion

The primary purpose of this doctoral research was to evaluate the effectiveness of the UAP using the CIPP Model of evaluation and create a framework for improvement. To achieve this, the study focused on three research objectives and tested five hypotheses to elucidate the relationships and impacts among the constructs. The research questions were addressed through comprehensive analysis, drawing insights from the discussions presented.

Under the direction of the DOA, the UAP has been instrumental in helping households mitigating living costs by promoting self-sufficient food production. This program also plays a significant role as one of the strategies to encourage social interaction among community members through urban agriculture activities (DOA, 2023).

This study is significant as it assesses the current impact of the program on participants and recommend measures for continuous quality improvement. This is to ensure the implementation of the program is aligned with the direction of the transformation plan based on the empowerment of the community in terms of enhancing their food security and nutrition by 2030.

This comprehensive study explores the intricacies of a program's context, input, process, impact on participants, and overall effectiveness, with a particular emphasis on evaluating the level of evaluation at the community level. The results show that the program's context, input, process, product, and program effectiveness are highly rated. The study offers valuable guidance to researchers, evaluators, and stakeholders on how to effectively improve the program by applying the CIPP constructs dimension and demonstrating how these contribute to the UAP's effectiveness.

The research highlights the significant impact and changes of CIPP on program effectiveness, which have been overlooked in previous studies. This inclusion contributes to the literature by evaluating the program's overall impact and changes. Furthermore, the study identifies interesting participant profiles in a specific category that could be useful for developing new offerings to meet the new needs of participants in the UAP in Malaysia. Once these needs and problems are addressed, the government can help participants make informed decisions and achieve empowerment. Additionally, the adjustments made to the UAP to appeal to the community can also be a potential source of enhancement for another agricultural program.

In conclusion, this thesis addresses a significant gap in both literature and practical knowledge, leading to a deeper and broader understanding of program evaluation. It enriches understanding of participants' needs and problems faced towards UAP improvement.

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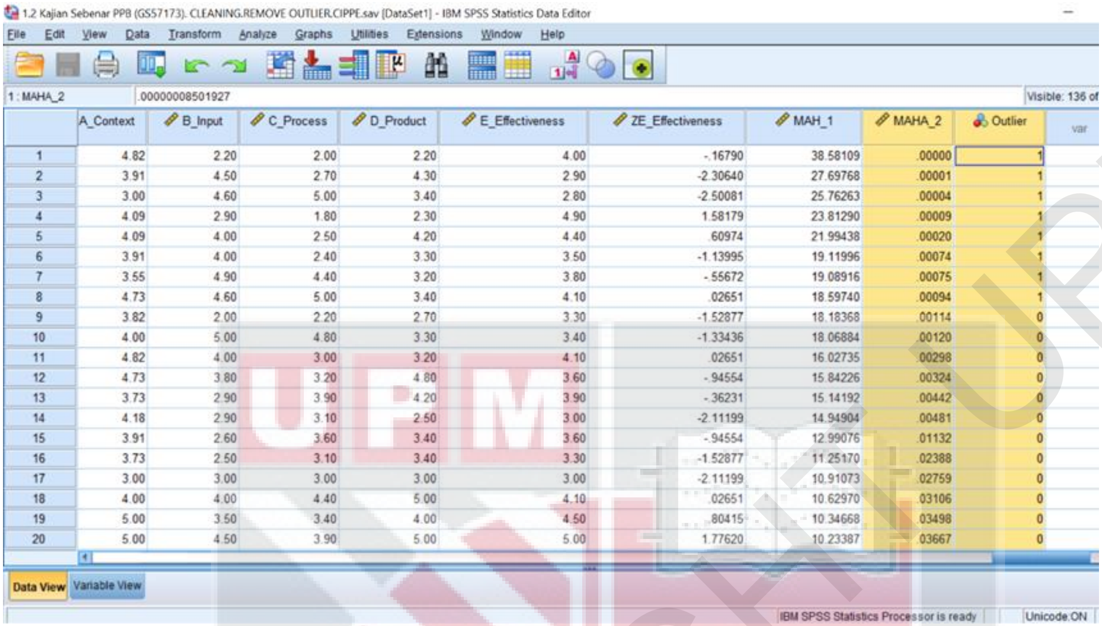
Normality used website : https://webpower.psychstat.org/models/kurtosis/

APPENDICES

Multivariate (Mahalanobis) – 8 outliers


1.2 Kajian Sebenar PPB (GS57173). CLEANING.REMOVE OUTLIER.CIPPE.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

1 : MAHA_2 .00000008501927 Visible: 136 of

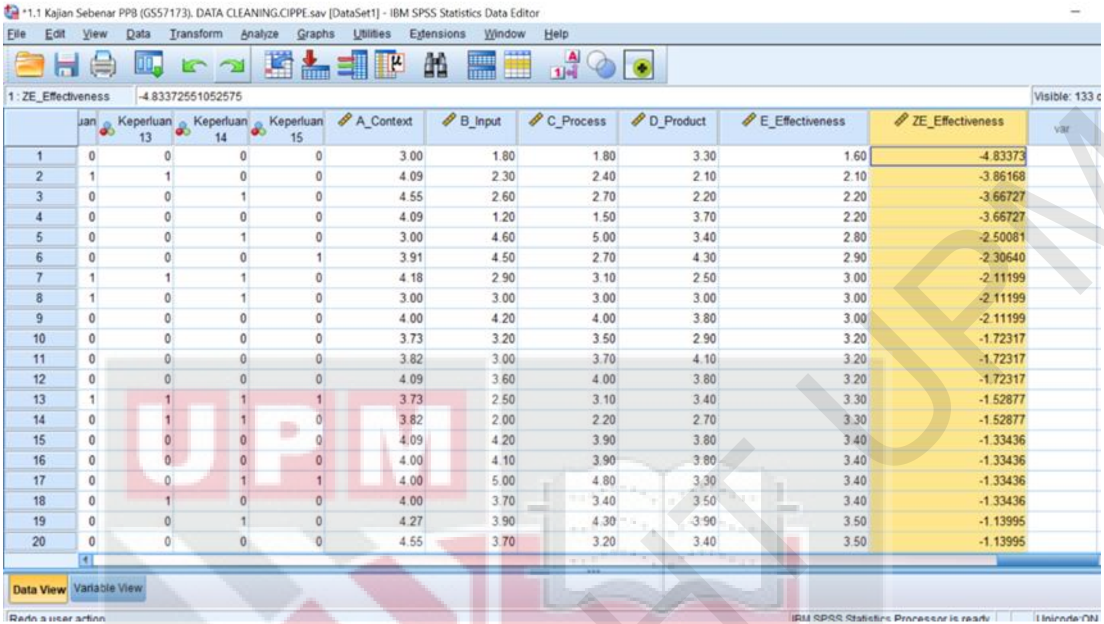
	A_Context	B_Input	C_Process	D_Product	E_Effectiveness	ZE_Effectiveness	MAH_1	MAHA_2	Outlier	var
1	4.82	2.20	2.00	2.20	4.00	-.16790	38.58109	.00000	1	
2	3.91	4.50	2.70	4.30	2.90	-2.30640	27.69768	.00001	1	
3	3.00	4.60	5.00	3.40	2.80	-2.50081	25.76263	.00004	1	
4	4.09	2.90	1.80	2.30	4.90	1.58179	23.81290	.00009	1	
5	4.09	4.00	2.50	4.20	4.40	.60974	21.99438	.00020	1	
6	3.91	4.00	2.40	3.30	3.50	-1.13995	19.11996	.00074	1	
7	3.55	4.90	4.40	3.20	3.80	-.55672	19.08916	.00075	1	
8	4.73	4.60	5.00	3.40	4.10	.02651	18.59740	.00094	1	
9	3.82	2.00	2.20	2.70	3.30	-1.52877	18.18368	.00114	0	
10	4.00	5.00	4.80	3.30	3.40	-1.33436	18.06884	.00120	0	
11	4.82	4.00	3.00	3.20	4.10	.02651	16.02735	.00298	0	
12	4.73	3.80	3.20	4.80	3.60	-.94554	15.84226	.00324	0	
13	3.73	2.90	3.90	4.20	3.90	-.36231	15.14192	.00442	0	
14	4.18	2.90	3.10	2.50	3.00	-2.11199	14.94904	.00481	0	
15	3.91	2.60	3.60	3.40	3.60	-.94554	12.99076	.01132	0	
16	3.73	2.50	3.10	3.40	3.30	-1.52877	11.25170	.02388	0	
17	3.00	3.00	3.00	3.00	3.00	-2.11199	10.91073	.02759	0	
18	4.00	4.00	4.40	5.00	4.10	.02651	10.62970	.03106	0	
19	5.00	3.50	3.40	4.00	4.50	.80415	10.34668	.03498	0	
20	5.00	4.50	3.90	5.00	5.00	1.77620	10.23387	.03667	0	

Data View Variable View

IBM SPSS Statistics Processor is ready Unicode:ON

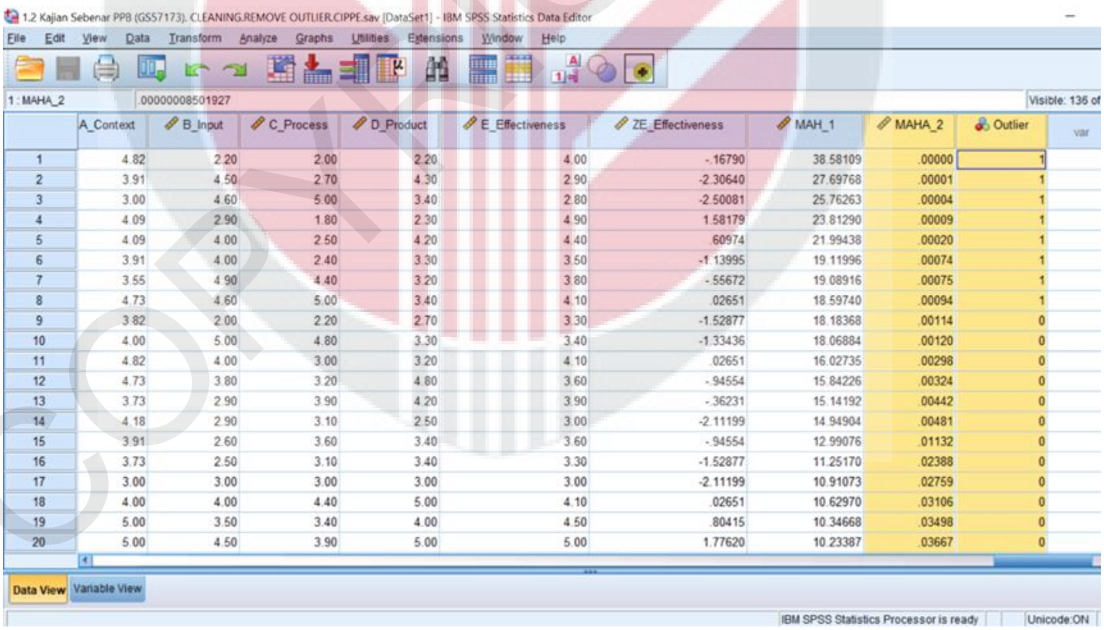
APPENDIX A

Univarite (Z score) – 4 outliers



	uan	Keperluan 13	Keperluan 14	Keperluan 15	A_Context	B_Input	C_Process	D_Product	E_Effectiveness	ZE_Effectiveness	var
1	0	0	0	0	3.00	1.80	1.80	3.30	1.60	-4.83373	
2	1	1	0	0	4.09	2.30	2.40	2.10	2.10	-3.86168	
3	0	0	1	0	4.55	2.60	2.70	2.20	2.20	-3.66727	
4	0	0	0	0	4.09	1.20	1.50	3.70	2.20	-3.66727	
5	0	0	1	0	3.00	4.60	5.00	3.40	2.80	-2.50081	
6	0	0	0	1	3.91	4.50	2.70	4.30	2.90	-2.30640	
7	1	1	1	0	4.18	2.90	3.10	2.50	3.00	-2.11199	
8	1	0	1	0	3.00	3.00	3.00	3.00	3.00	-2.11199	
9	0	0	0	0	4.00	4.20	4.00	3.80	3.00	-2.11199	
10	0	0	0	0	3.73	3.20	3.50	2.90	3.20	-1.72317	
11	0	0	0	0	3.82	3.00	3.70	4.10	3.20	-1.72317	
12	0	0	0	0	4.09	3.60	4.00	3.80	3.20	-1.72317	
13	1	1	1	1	3.73	2.50	3.10	3.40	3.30	-1.52877	
14	0	1	1	0	3.82	2.00	2.20	2.70	3.30	-1.52877	
15	0	0	0	0	4.09	4.20	3.90	3.80	3.40	-1.33436	
16	0	0	0	0	4.00	4.10	3.90	3.80	3.40	-1.33436	
17	0	0	1	1	4.00	5.00	4.80	3.30	3.40	-1.33436	
18	0	1	0	0	4.00	3.70	3.40	3.50	3.40	-1.33436	
19	0	0	1	0	4.27	3.90	4.30	3.90	3.50	-1.13995	
20	0	0	0	0	4.55	3.70	3.20	3.40	3.50	-1.13995	

Multivariate (Mahalanobis)-8 outliers



	A_Context	B_Input	C_Process	D_Product	E_Effectiveness	ZE_Effectiveness	MAH_1	MAHA_2	Outlier	var
1	4.82	2.20	2.00	2.20	4.00	-.16790	38.58109	.00000	1	
2	3.91	4.50	2.70	4.30	2.90	-2.30640	27.69768	.00001	1	
3	3.00	4.60	5.00	3.40	2.80	-2.50081	25.76263	.00004	1	
4	4.09	2.90	1.80	2.30	4.90	1.58179	23.81290	.00009	1	
5	4.09	4.00	2.50	4.20	4.40	.60974	21.99438	.00020	1	
6	3.91	4.00	2.40	3.30	3.50	-1.13995	19.11996	.00074	1	
7	3.55	4.90	4.40	3.20	3.80	-.55672	19.08916	.00075	1	
8	4.73	4.60	5.00	3.40	4.10	.02651	18.59740	.00094	1	
9	3.82	2.00	2.20	2.70	3.30	-1.52877	18.18368	.00114	0	
10	4.00	5.00	4.80	3.30	3.40	-1.33436	18.06884	.00120	0	
11	4.82	4.00	3.00	3.20	4.10	.02651	16.02735	.00298	0	
12	4.73	3.80	3.20	4.80	3.60	-.94554	15.84226	.00324	0	
13	3.73	2.90	3.90	4.20	3.90	-.36231	15.14192	.00442	0	
14	4.18	2.90	3.10	2.50	3.00	-2.11199	14.94904	.00481	0	
15	3.91	2.60	3.60	3.40	3.60	-.94554	12.99076	.01132	0	
16	3.73	2.50	3.10	3.40	3.30	-1.52877	11.25170	.02388	0	
17	3.00	3.00	3.00	3.00	3.00	-2.11199	10.91073	.02759	0	
18	4.00	4.00	4.40	5.00	4.10	.02651	10.62970	.03106	0	
19	5.00	3.50	3.40	4.00	4.50	.80415	10.34668	.03498	0	
20	5.00	4.50	3.90	5.00	5.00	1.77620	10.23387	.03667	0	

APPENDIX B

Full Collinearity

	CONTEXT	INPUT	PROCESS	PRODUCT	PROGRAM EFFECTIVENESS
VIF	1.792	2.964	2.964	1.886	3.095

Reliability

Context

Reliability Statistics

Cronbach's Alpha	N of Items
.849	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
A1	42.74	14.814	.476	.841
A2	42.72	13.905	.587	.832
A3	42.52	15.019	.534	.837
A4	42.50	14.932	.528	.837
A5	42.65	14.386	.629	.829
A6	42.74	14.124	.531	.837
A7	42.53	15.063	.460	.842
A8	42.58	14.760	.586	.833
A9	42.63	14.322	.539	.836
A10	42.43	15.180	.434	.844
A11	42.54	14.695	.594	.832

Input

Reliability Statistics

Cronbach's Alpha	N of Items
.884	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B1	37.37	21.659	.556	.877
B2	37.11	23.044	.352	.889
B3	37.20	21.881	.557	.878
B4	37.28	19.723	.710	.866
B5	37.31	20.118	.693	.867
B6	37.52	18.364	.688	.870
B7	37.57	18.971	.645	.873
B8	37.15	20.549	.699	.868
B9	37.12	21.103	.690	.870
B10	37.11	21.297	.667	.871

Process

Reliability Statistics

Cronbach's Alpha	N of Items
.890	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C1	37.18	19.809	.647	.878
C2	37.43	17.888	.584	.889
C3	37.19	18.793	.737	.871
C4	37.03	19.921	.720	.874
C5	37.11	20.013	.654	.878
C6	37.21	20.064	.559	.883
C7	37.16	19.620	.606	.880
C8	37.10	19.121	.705	.873
C9	37.14	19.553	.664	.876
C10	37.03	20.750	.525	.885

Product

Reliability Statistics

Cronbach's Alpha	N of Items
.828	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
D1	36.80	18.298	.503	.814
D2	37.16	15.897	.513	.818
D3	37.10	15.938	.641	.797
D4	36.91	17.626	.539	.810
D5	36.79	17.301	.503	.813
D6	37.24	16.141	.520	.815
D7	36.76	18.122	.579	.809
D8	36.66	18.758	.478	.817
D9	36.68	18.218	.544	.811
D10	36.73	18.248	.493	.815

Effectiveness

Reliability Statistics

Cronbach's Alpha	N of Items
.858	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
E1	37.27	15.202	.476	.853
E2	37.10	15.002	.636	.839
E3	37.16	14.930	.634	.839
E4	37.08	15.714	.525	.848
E5	37.22	14.808	.703	.834
E6	37.14	15.605	.563	.845
E7	37.16	14.808	.663	.837
E8	37.14	14.909	.593	.842
E9	37.43	14.221	.456	.863
E10	37.19	14.921	.555	.845

Normality test

Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
A_Context	230	3.00	5.00	4.2597	.37996	.318	.160	-.204	.320
B_Input	230	2.00	5.00	4.1417	.50196	-.679	.160	1.609	.320
C_Process	230	2.20	5.00	4.1287	.48834	-.189	.160	.517	.320
D_Product	230	2.50	5.00	4.0983	.45982	-.072	.160	.389	.320
E_Effectiveness	230	3.00	5.00	4.1322	.42715	.108	.160	.069	.320
Valid N (listwise)	230								

PLS-SEM

Path Coefficients

Mean, STDEV, T-Values, P-Values | Confidence Intervals | Confi

	Original ...	Sample ...	Standard ...	T Statistic...	P Values
A_CONTE...	0.217	0.213	0.052	4.147	0.000
B_INPUT -...	0.200	0.203	0.077	2.600	0.010
C_PROCE...	0.228	0.230	0.079	2.905	0.004
D_PROD...	0.330	0.332	0.070	4.717	0.000

Construct Crossvalidated Redundancy

Total | Case1 | Case2 | Case3

	SSO	SSE	Q^2 (=1-S...
A_CONTE...	1380.000	1380.000	
B_INPUT	2300.000	2300.000	
C_PROCE...	2300.000	2300.000	
D_PROD...	1150.000	1150.000	
E_EFFECTI...	1380.000	885.097	0.359

Construct Crossvalidated Communality

Total | Case1 | Case2 | Case3

	SSO	SSE	Q^2 (=1-S...
A_CONTE...	1380.000	940.810	0.318
B_INPUT	2300.000	1409.163	0.387
C_PROCE...	2300.000	1341.948	0.417
D_PROD...	1150.000	821.131	0.286
E_EFFECTI...	1380.000	871.489	0.368

R Square

Matrix | R Square | R Square Adjusted

	R Square	R Square Adjusted
E_EFFECTI...	0.668	0.662

f Square

Matrix | f Square

	A_CONTE...	B_INPUT	C_PROCE...	D_PROD...	E_EFFECT...
A_CONTE...					0.087
B_INPUT					0.041
C_PROCE...					0.056
D_PROD...					0.183
E_EFFECTI...					

Importance-Performance Map [E_EFFECTIVENESS] (constructs, unstandardized effects)

Construct Total... | Construct Perfo... | Copy to Clipboard: Excel Format | R Format

	Performances
A_CONTE...	71.271
B_INPUT	74.660
C_PROCE...	75.680
D_PROD...	74.961

Importance-Performance Map [E_EFFECTIVENESS] (co

Construct Total... | Construct Perfo... | Copy

	E_EFFECT...
A_CONTE...	0.223
B_INPUT	0.189
C_PROCE...	0.218
D_PROD...	0.327

Pre-Testing

PRE-TESTING/PRA UJI

Lokasi: Kebun Komuniti Bangi Seksyen 3

MAKLUMAT PENGKAJI

Nama Pelajar	:	Munifah Siti Amira Bt Yusuf
Penyelia Utama	:	Prof Madya Dr. Norsida Man
Penyelia Bersama	:	Prof. Dr. Ismi Arif Bin Ismail
		Dr. Nur Bahiah Mohamed Haris
Tajuk Kajian	:	**Penilaian Program Pertanian Bandar Jabatan Pertanian Malaysia**

Tujuan prauji adalah untuk:

a) Memastikan soalan-soalan dalam soal selidik difahami dengan baik oleh responden.
b) Mengenalpasti bahagian soalan yang bermasalah (contoh: laras bahasa sukar difahami, kurang pilihan jawapan, soalan berulang, soalan sensitive, skala yang tidak seragam, susunan pilihan jawapan yang kurang teratur, kurang ruang utk menjawab dll).
c) Mengenalpasti samaada responden sebenar telah menafsir/memahami soalan tersebut dengan betul.
d) Mengenalpasti samaada bilangan soalan yang disediakan terlampau membebankan responden.
e) Mengenalpasti tempoh masa yang diambil oleh responden untuk menjawab keseluruhan soalan.

Senarai semak perkara penting perlu di soal:

a) Tempoh masa yang diambil untuk siap memahami keseluruhan soal selidik
b) Arahan untuk menjawab soalan dinyatakan dengan jelas dan tepat
c) Adakah semua soalan perlu, bersesuaian dan berkaitan dengan maklumat yang ingin diperoleh?
d) Adakah soalan mengikut susunan bahagian yang telah ditetapkan?
e) Adakah soalan "direct" dan ringkas?
f) Adakah terdapat soalan yang responden rasa agak sensitif, tidak selesa, keliru, jengkel atau memalukan?
g) Adakah terdapat istilah dan Bahasa teknikal yang tidak perlu?
h) Adakah pilihan jawapan yang disediakan perlu dimasukkan?

Contoh cara merekod:

No. Responden	Tarikh	Masa	Komen/Isu
1	21 Ogos 2022	9 am-10am	- Soalan no 10 mengelirukan . - No 40 sukar difahami - Soalan 1 terlalu panjang
2	21 Ogos 2022	9 am-9.30am	-No 8 mempunyai aras yang tinggi
3	21 Ogos 2022	9 am-9.45am	-Soalan terakhir, mudahkan sikit laras bahasa -soalan 9 dan 14 seperti berulang

Pre-Testing

No.	Comment/Issue	Action Taken
Section A: Demographic Profile		
1.	Item 6 is not understandable	Has been improved.
2.	Item 6- Agriculture education is too specific. Not many have that education formally	Has been improved to the general education level.
3.	The questionnaires are too long	Remained closed-ended 20 items for this section.
4.	All the items can be understood but complicated	Has been improved to more specific and direct items.
5.	Item 8- No range of income	This has been improved by providing the range for a rough estimate of monthly income.
	Item 18 - Narrow down the range of vegetable expenses. It's too large; the vegetable expenses aren't that high.	Has been improved to a more reliable estimation of vegetable expenses.
	Item 20: Never attended an urban agriculture course.	This has been improved by adding "e. never attended any UA course" in Table item 20.
Section B: CIPPE Evaluation		
1.	Item A2 and A3 looks similar	Remained as the items are developed based on the UAP objectives.
2.	Section B: Items too long	Has been improved to be more specific and direct
3.	The input evaluation part cannot be understood	Has been improved by reducing the language level from high to lower.
4.	This section should have an option answer like "Yes or No"	Remained using 5 Likert scale as this section is to conduct inferential analysis.
Section C: Problems and Needs of Improvement		
	C1- c,d,k,l,m.j – not necessary, not clear	Has been improved from 18 items to 14 items.
	C2 – reduce items	Has been improved from 16 items to 15 items.

UPM
UNIVERSITI PUTRA MALAYSIA

BORANG PENGESAHAN INSTRUMEN KAJIAN

TAJUK KAJIAN:

PENILAIAN PELAKSANAAN PROGRAM PERTANIAN BANDAR, JABATAN PERTANIAN MALAYSIA MENGGUNAKAN MODEL PENILAIAN KIPP

Adalah di sahkan bahawa instrument kajian ini telah disediakan oleh Munifah Siti Amira Binti Yusuf (GS57173) daripada Jabatan Teknologi Pertanian, Universiti Putra Malaysia, Serdang.

Instrumen ini telah di semak oleh saya dan hasilnya adalah seperti berikut:

No.	Perkara	Sesuai	Tidak sesuai	Ulasan/cadangan penambahbaikan
1.	Fomat instrument kajian	✓		
2.	Ketepatan penggunaan konstruk	✓		
3.	Pembentukan item menepati kontrak yang di bina	✓		
4.	Kejelasan makna setiap item (rujuk instrument kajian)	✓		
5.	Kesesuaian item dalam soal selidik	✓		
6.	Penyusunan item dalam soal selidik	✓		
7.	Kesesuaian bahasa yang di gunakan	✓		
8.	Kesesuaian saiz tulisan	✓		
9.	Kejelasan tentang arahan yang di berikan	✓		
10.	Penggunaan jarak tulisan	✓		
11.	Petunjuk bagi skala pengukuran	✓		
12.	Kejelasan objektif instrumen	✓		

Ulasan Am:

Secara keseluruhan, instrumen kajian ini menepati dan selaras dengan objektif serta tujuan pelaksanaan Program Pertanian Bandar.

Tandatangan : Norhaina

Nama : NORHAINA BINTI ABD GHANI

Jawatan/Cop rasmi : Pendolong Pengarah, Bahagian Pertanian Bandar, Jabatan Pertanian

Tarikh : 30/9/22.

Ethical Approval

Ref. no: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)
Date: 26 August 2022

Dear Prof./Dr./Mr./Ms.,

APPLICATION FOR JKEUPM ETHICAL CLEARANCE: APPROVED

With reference to the above, I am pleased to inform you that your application for ethical clearance for the research project entitled **'AN EVALUATION OF URBAN AGRICULTURE PROGRAM BY DEPARTMENT OF AGRICULTURE (DOA) MALAYSIA USING CIPP MODEL'** has been approved.

The approval is valid from **26 AUGUST 2022 until 26 AUGUST 2023.**

Please note that the official letter of approval will be issued as soon as possible. However, the ethical clearance is considered effective from the date of this notification, and you may now proceed with your research.

Kindly remind the ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

Researchers should also complete a Study Final Report upon study completion. The form can be obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) website (http://www.tncpi.upm.edu.my/faildokumen).

If you have any enquiries, please contact at number 03-97691244/1602.

Note: Please use this reference number for any transaction:- **JKEUPM-2022-657**

Thank you.

Yours faithfully,

Prof. Dr. Zamberi Sekawi
Chair
Ethics Committee for Research Involving Human Subjects
Universiti Putra Malaysia

QUESTIONNAIRE

UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

No: _____

QUESTIONNAIRE
AN EVALUATION OF URBAN AGRICULURE PROGRAM (UAP), DEPARTMENT OF AGRICULTURE MALAYSIA

PhD Student:
Munifah Siti Amira Yusuf
017-2800993

Supervisor:
Professor Dr Norsida Man

This study was carried out to fulfil the requirement of graduating students with a Doctor of Philosophy Degree and involved the evaluation of the Urban Agriculture Program (UAP) implemented by the Department of Agriculture Malaysia in producing the development program implementation framework for the purpose of continuous improvement.

This questionnaire contains **TWO** (2) main parts:

- SECTION A : DEMOGRAPHICS OF RESPONDENTS
- SECTION B : EVALUATION OF URBAN AGRICULTURE PROGRAM OF PARTICIPANTS
  - ✓ **Evaluation of the CONTEXT Dimension**
  - ✓ **Evaluation of INPUT Dimension**
  - ✓ **Evaluation of PROCESS Dimension**
  - ✓ **Evaluation of PRODUCT Dimension**
  - ✓ **Effectiveness of UAP Implementation**
- SECTION C : PROBLEM AND IMPROVEMENT NEEDS OF THE PROGRAM

RESEARCH OBJECTIVES:

1. To evaluate the level of effectiveness of the **Context** dimension in terms of the appropriateness of the objectives and goals of the Urban Agriculture Program (UAP) among the program participants.
2. To evaluate the level of effectiveness of the **Input** dimension in terms of the quality of course support, Training, incentive resources (equipment and financial), extension services, exhibitions, and demonstrations provided in the extension activities among UAP participants.
3. To evaluate the level of effectiveness of the **Process** dimension in terms of implementation performance in achieving the UAP objectives.
4. To evaluate the level of effectiveness of the **Product** dimension in terms of actual UAP results.
5. To determine the contribution of the **Context, Input, Process, and Product (CIPP)** dimensions to the effectiveness of UAP implementation.
6. To develop a framework for improving UAP implementation.

All feedback is **CONFIDENTIAL** to help the researcher carry out this study successfully.

Name of Participant :
Community Garden :
Tel. No :

SECTION A: DEMOGRAPHIC PROFILE OF RESPONDENT

instruction: please mark (/) in the space provided and write the required information in the relevant column.

1. Age: ___________ years old

2. Gender: a. Male ( ) b. Female ( )

3. Race:
   a. Malay
   b. Chinese
   c. India
   d. Others (Specify):

4. Maritaltal Status:
   a. Single
   b. Married
   c. Single father
   d. Single mother

5. Education Level:

No.	Education Level	Choose (/)	No.	Education Level	Choose (/)
a.	Do not go to school		e.	Degree of Bachelor	
b.	Finished Primary School		f.	Degree of Master	
c.	Finished Secondary School		g.	Degree of Doctorate	
d.	SPM/STPM/Diploma		h.	Others Certificate:	

6. Main Occupation (**Note: Can choose more than one answer**)

No.	Main Occupation	Choose (/)	No.	Main Occupation	Choose (/)
a.	Government servant		c.	Retired	
b.	Private servant		d.	Housewife	
c.	Self-employed		e.	Others (Specify):	

7. Rough estimate of monthly income:

No.	Gross Income	Choose (/)	No.	Gross Income	Choose (/)
a.	Less than RM1000		c.	RM3001 - RM4000	
b.	RM1000 - RM2000		d.	RM4001 - RM5000	
c.	RM2001 - RM3000		e.	More than RM5000	

8. Number of households (including respondent): ____________ person (s)
9. Year of participation in the Community Urban Agriculture Program (UAP): ____________
10. Year of establishment of your urban garden: ___________

11. Ways of applying for participation: (**Note: Can choose more than one answer**)

No.	Application Ways	Choose (/)
a.	Apply on your own/Group initiative	
b.	The approach of the Department of Agriculture	
c.	Other ways of participation (Specify):	

12. Types of urban garden land ownership:

No.	Type of Land Ownership	Choose (/)
a.	Own Land	
b.	Land of City Council	
c.	Pioneer Land (eg.: TNB, JPS etc)	
d.	Others (Specify):	

13. Reasons for joining UAP: **(Note: Can choose more than one answer)**

No.	Reasons	Choose (/)
a.	Interests/hobbies/free time	
b.	Part-time work/extra income	
c.	Already retired	
d.	Have an area to cultivate	
e.	Family heirloom	
f.	Invited by friend	
g.	Recommended by the Department of Agriculture	
h.	Others (Specify)	

14. The scope or type of agricultural activities carried out in your urban garden: **(Note: Can choose more than one answer)**

No.	Scope/Type of Agricultural Activities	Choose (/)
a.	Vegetables (eg.: mustard, cabbage, tomato, cucumber, etc)	
b.	Fruits (eg.: rockmelon, watermelon etc)	
c.	Livestock (eg.: cow, goat, chicken, duck, stingless bees, etc)	
d.	Aquaculture (eg.: prawn, fish, etc)	

15. Type of cultivation systems in your garden: **(Note: Can choose more than one answer)**

No.	Cropping Systems	Choose (/)
a.	Conventional cropping system (eg.: on the land)	
b.	Fertigation cropping system (eg.: fertigation chilli etc)	
c.	Hydroponic cropping system (eg.: lettuce)	
d.	Aquaponic system	
e.	Others: (Specify)	

16. Agricultural practices being practised in your urban garden:

No.	Agricultural Practices	Choose (/)
a.	Fully organic	
b.	Partially organic (eg.: organic fertilizer + chemical pesticides)	
c.	Completely chemical	

17. Number of community members who are involved in your urban garden activities:

No.	Number of Community Members	Choose (/)
a.	Less than 5 people	
b.	1-5 people	
c.	6-10 people	
d.	11-15 people	

12. Types of urban garden land ownership:

No.	Type of Land Ownership	Choose (/)
a.	Own Land	
b.	Land of City Council	
c.	Pioneer Land (eg.: TNB, JPS etc)	
d.	Others (Specify):	

13. Reasons for joining UAP: **(Note: Can choose more than one answer)**

No.	Reasons	Choose (/)
a.	Interests/hobbies/free time	
b.	Part-time work/extra income	
c.	Already retired	
d.	Have an area to cultivate	
e.	Family heirloom	
f.	Invited by friend	
g.	Recommended by the Department of Agriculture	
h.	Others (Specify)	

14. The scope or type of agricultural activities carried out in your urban garden: **(Note: Can choose more than one answer)**

No.	Scope/Type of Agricultural Activities	Choose (/)
a.	Vegetables (eg.: mustard, cabbage, tomato, cucumber, etc)	
b.	Fruits (eg.: rockmelon, watermelon etc)	
c.	Livestock (eg.: cow, goat, chicken, duck, stingless bees, etc)	
d.	Aquaculture (eg.: prawn, fish, etc)	

15. Type of cultivation systems in your garden: **(Note: Can choose more than one answer)**

No.	Cropping Systems	Choose (/)
a.	Conventional cropping system (eg.: on the land)	
b.	Fertigation cropping system (eg.: fertigation chilli etc)	
c.	Hydroponic cropping system (eg.: lettuce)	
d.	Aquaponic system	
e.	Others: (Specify)	

16. Agricultural practices being practised in your urban garden:

No.	Agricultural Practices	Choose (/)
a.	Fully organic	
b.	Partially organic (eg.: organic fertilizer + chemical pesticides)	
c.	Completely chemical	

17. Number of community members who are involved in your urban garden activities:

No.	Number of Community Members	Choose (/)
a.	Less than 5 people	
b.	1-5 people	
c.	6-10 people	
d.	11-15 people	

e.	16-20 people	
f.	More than 21 people	

18. Estimated monthly vegetable expenses of your family **BEFORE** and **AFTER** joining UAP, Department of Agriculture.
Note: Choose (/) one answer for **BEFORE** and **AFTER**

No.	**Monthly Expenses**	**Vegetable Expenses**	
		Before	**After**
a.	Less than RM20 (Specify):		
b.	RM21 – RM40		
c.	RM41 – RM60		
d.	RM61 – RM80		
e.	RM81 – RM100		
f.	More than RM101 (Specify):		

19. Knowing UAP through **(Note: Can choose more than one answer)**

No.	**UAP Information Source From**	**Choose (/)**
a.	Friends	
b.	Family Members	
c.	Department of Agriculture/Agency under MAFI	
d.	Social Media (Specify):	
e.	Neighbourhood	
f.	Company	
g.	NGO	
h.	Others (Specify): ____________	

20. Courses or Training have been attended related to urban agriculture:
(Note: Can choose more than one answer)

No.	**Courses/Training Attended**	**Choose (/)**
a.	Introduction of crop types for urban gardens (theory)	
b.	Organic pest control management in the urban garden	
c.	Preparation of urban garden cropping site/plot	
d.	Cropping practice/planting methods	
e.	Never attended any urban agriculture course	
f.	Others (Specify):	

SECTION B: EVALUATION OF RESPONDENT TO THE URBAN AGRICULTURE PROGRAM (UAP)

A. Evaluation of Context Dimension
Instructions: Please mark (/) in the box provided according to your level of agreement.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

Notes:
1. "**Objective**" refers to a specific UAP objective by the Department of Agriculture
2. "**Purpose**" refers to the more general objectives of UAP.
3. "**UAP**" refers to Urban Agriculture Program.

No.	Relevance of the Objectives and Purposes of UAP	Scale				
		1	2	3	4	5
A1.	The objective of UAP is suitable to help in reducing the living cost among urban gardeners.					
A2.	The objective of UAP is suitable to help in creating community farming activities that produce enough food for families.					
A3.	The objective of UAP is suitable to help in creating community farming activities that produce quality and safe food.					
A4.	The objective of UAP is in line with the program's direction, which is to create social interaction in the community.					
A5.	The purpose of UAP is very relevant to support the guarantee of food supply (sufficient, easy access, availability of food, and others) at the household level.					
A6.	The purpose of UAP is very suitable to reduce the import of agricultural products from foreign countries.					
A7.	The purpose of UAP is suitable to instil the interest of citizens in cultivating crops.					
A8.	The purpose of UAP is relevant in implementing the production of sustainable food sources.					
A9.	The purpose of UAP is suitable to improve the economy of the participant's household.					
A10.	The purpose of UAP is relevant to create harmonious and prosperous community relations.					
A11.	The purpose of UAP is relevant to advancing the Malaysian agriculture sector.					

B. Evaluation of Input Dimension
Instructions: Please mark (/) in the box provided according to your level of agreement.

Strongly Disagree	Disagree	Not Sure	Moderately Agree	Strongly Agree
1	2	3	4	5

No.	Evaluation of Input Dimension	Scale				
		1	2	3	4	5
B1.	Appropriate technological facilities have been provided to assist the program participants.					
B2.	Incentives and assistance were provided to the program participants to start garden activities (eg.: financial, seeds, kits, fertilizers, etc).					
B3.	Extension services are provided continuously to the program participants to help them to solve crop problems.					
B4.	Urban agriculture training/courses have been organized to explain the theoretical knowledge and techniques related to crops, to the program participants.					
B5.	Demonstrations of agricultural methods have been shown to help the program participants in mastering the skills and knowledge of agriculture.					
B6.	Exhibitions related to agriculture were given to instil the interest of program participants in farming.					
B7.	Virtual and face-to-face exhibitions have been implemented to make it easier for program participants to obtain information about agriculture.					
B8.	Experienced and knowledgeable Agricultural Extension Officers are assigned to assist program participants.					
B9.	Agricultural Extension Officers skilled in communication are assigned to discuss the crop problems program participants faced.					
B10.	Active and highly committed Agricultural Extension Officers are assigned to provide guidance to program participants.					

C. **Evaluation of Process Dimension**

Instructions: Please mark (/) in the box provided according to your level of agreement.

Strongly Disagree	Disagree	Not Sure	Moderately Agree	Strongly Agree
1	2	3	4	5

No.	Evaluation of Process Dimension	Scale				
		1	2	3	4	5
C1.	Department of Agriculture and certain parties are often involved in monitoring to ensure that UAP activities run smoothly.					
C2.	Agricultural Extension Officers have explained the concept and method of producing downstream products from crops.					
C3.	Agricultural Extension Officers always plan the community garden activities to ensure UAP run well.					
C4.	Agricultural Extension Officers always recommend planting methods to help participants to improve crop performance.					
C5.	Agricultural Extension Officers always encourage participants to practise sustainable agriculture.					
C6.	Agricultural Extension Officers monitor the farm records of participants periodically to evaluate their performance.					
C7.	Agricultural Extension Officers always involve the participants during agricultural methods demonstrations.					
C8.	Agricultural Extension Officers recommend the type of technology and crops that are suitable for the characteristics of the garden area.					
C9.	Agricultural Extension Officers always carry out UAP activities with participants through various methods. (eg.: social media or face-to-face)					
C10.	Agricultural Extension Officers always give clear feedback to help the participants understand agriculture-related matters.					

D. **Evaluation of Product Dimension**

Instructions: Please mark (/) in the box provided according to your level of agreement.

Strongly Disagree	Disagree	Not Sure	Moderately Agree	Strongly Agree
1	2	3	4	5

No.	Evaluation of Product Dimension	Scale				
		1	2	3	4	5
D1.	I understand more about the method to produce crops that are safe to eat.					
D2.	I understand the method of producing downstream products from crops after participating in the program.					
D3.	I have mastered managing vegetable expenses efficiently after participating in the program.					
D4.	I am able to teach my friends again about the agricultural knowledge gained through participation in UAP.					
D5.	I have managed to reduce the amount of household spending on buying vegetables after participating in UAP.					
D6.	I have successfully earned a side income through UAP.					
D7.	I become easier to communicate with the gardeners about agricultural activities after participating in UAP.					
D8.	My relationship with my fellow gardeners became closer after participating in UAP.					
D9.	I am more concerned and easier to do charity after participating in UAP.					
D10.	My health improved after participating in UAP.					

E. Effectiveness of Urban Agriculture Program Implementation
Instructions: Please mark (/) in the box provided according to your level of agreement.

Strongly Disagree	Disagree	Not Sure	Moderately Agree	Strongly Agree
1	2	3	4	5

No.	Effectiveness of Implementation	Scale				
		1	2	3	4	5
E1.	UAP has opened an opportunity for a local citizen to become a successful farm entrepreneur.					
E2.	UAP has successfully applied sustainable farming practices that are safe for the environment (eg: avoiding soil erosion, water pollution and others).					
E3.	UAP has given early exposure to agricultural education to the youth to participate in the agriculture field.					
E4.	UAP has increased the access of the population to food crop sources.					
E5.	UAP has increased in terms of number (eg.: the number of urban gardens)					
E6.	UAP becomes more systematically through the monitoring of agency (eg.: urban garden management)					
E7.	UAP has increased the agricultural production in the city (eg.: increased urban garden production)					
E8.	Efforts of the government and various parties to help in food security at the household level have been achieved through UAP.					
E9.	Program participants understand the concept of crops and downstream products introduced by the Department of Agriculture and agricultural agencies.					
E10.	UAP has been successfully promoted and recognized by various parties and age groups.					

SECTION C: PROBLEMS AND IMPROVEMENT NEEDS OF URBAN AGRICULTURE PROGRAM BY PARTICIPANT

1. State your main problem when carrying out urban garden activities.
   Note: Can choose (/) more than one answer.

No.	Problem	(/)
a.	Lack of garden equipment.	
b.	Lack of suitable infrastructure to carry out garden activities (eg: stores, cottages, greenhouses, irrigation systems, etc).	
c.	It is easy to lose/theft crops.	
d.	Crops are easily infected by diseases and attacked by pests.	
e.	Lack of crop management knowledge.	
f.	Lack of understanding between urban gardeners.	
g.	There is no leader or head of the garden to guide the participants.	
h.	Geographical features problems in cropping area.	
i.	Lack of participation and involvement of members from the local people.	
j.	Program activities organized/promoted by Agricultural Extension Officers are difficult for participants to follow (eg: distance, inconvenient time, paid, etc.).	
k.	Agricultural Extension Officers do not come to monitor and give advice.	
l.	Lack of water resources.	
m.	Extreme rain.	
n.	Other problems faced (Specify):	

2. UAP improvement needs:
   Note: Can choose (/) more than one answer.

No.	Improvement Needs	(/)
a.	Agricultural courses should be given free of charge by various parties.	
b.	Farm equipment, fertilizer, and seeds for the garden should be provided by a specific sponsor (eg: water pump, etc).	
c.	There is a need for continuous agricultural guidance and advice from all parties.	
d.	The number and area of urban gardens in the surrounding area should be increased.	
e.	Giving additional incentives to gardeners.	
f.	More Agricultural Extension Officers need to be assigned for the smoothness of UAP.	
g.	UAP promotion needs to be improved.	
h.	Incentives in the form of smart agricultural technology and equipment should be given to farmers under UAP.	
i.	The application process to work on UAP needs to be simplified (eg: faster land approval time, etc).	
j.	There is a need for continuous monitoring from agricultural agencies and various parties.	
k.	Agricultural Extension Officers who are committed and friendly with program participants are needed.	
l.	UAP should be made one of the agro-tourism locations for the community.	
m.	The involvement of the private sector and NGOs is needed to advance UAP.	
n.	Agriculture product marketing assistance should be implemented by agricultural agencies.	
o.	Other needs (Specify):	

Suggestions/comments:

If you are not satisfied (complaints, comments, suggestions, etc) with the Urban Agriculture Program, please state:

....

....

....

THANK YOU FOR YOUR COOPERATION
MAY GOD BLESS THIS PURE EFFORT

No: ______

SEMI-STRUCTURED INTERVIEW

AN EVALUATION OF URBAN AGRICULURE PROGRAM (UAP), DEPARTMENT OF AGRICULTURE MALAYSIA

Student:
Munifah Siti Amira Yusuf (0172800993)

Penyelia:
Prof. Madya Dr. Norsida Man

This study was carried out to fulfil the requirement of graduating students with a Doctor of Philosophy Degree and involved the evaluation of the Urban Agriculture Program (UAP) implemented by the Department of Agriculture Malaysia in producing the development program implementation framework for the purpose of continuous improvement.

This questionnaire contains **TWO (2)** main parts:

- **SECTION A : DEMOGRAPHICS OF RESPONDENTS**
- **SECTION B : EVALUATION OF URBAN AGRICULTURE PROGRAM OF PARTICIPANTS**
  - ✓ **Evaluation of the CONTEXT Dimension**
  - ✓ **Evaluation of INPUT Dimension**
  - ✓ **Evaluation of PROCESS Dimension**
  - ✓ **Evaluation of PRODUCT Dimension**
  - ✓ **Effectiveness of UAP Implementation**
- **SECTION C : PROBLEM AND IMPROVEMENT NEEDS OF THE PROGRAM**

RESEARCH OBJECTIVES:

1. To evaluate the level of effectiveness of the **Context** dimension in terms of the appropriateness of the objectives and goals of the Urban Agriculture Program (UAP) among the program participants.
2. To evaluate the level of effectiveness of the **Input** dimension in terms of the quality of course support, Training, incentive resources (equipment and financial), extension services, exhibitions, and demonstrations provided in the extension activities among UAP participants.
3. To evaluate the level of effectiveness of the **Process** dimension in terms of implementation performance in achieving the UAP objectives.
4. To evaluate the level of effectiveness of the **Product** dimension in terms of actual UAP results.
5. To determine the contribution of the **Context, Input, Process, and Product (CIPP)** dimensions to the effectiveness of UAP implementation.
6. To develop a framework for improving UAP implementation.

All feedback is **CONFIDENTIAL** to help the researcher carry out this study successfully.

Name of Participant :
Community Garden :
Tel. No :

SECTION A: DEMOGRAPHIC PROFILE OF RESPONDENT

Instruction: please mark (/) in the space provided and write the required information in the relevant column.

1. Age: ____________ years old

2. Gender: a. Male ( ) b. Female ( )

3. Race:
   a. Malay
   b. Chinese
   c. India
   d. Others (Specify):

4. Maritaltal Status:
   a. Single
   b. Married
   c. Single father
   d. Single mother

5. Education Level:

No.	Education Level	Choose (/)	No.	Education Level	Choose (/)
a.	Do not go to school		e.	Degree of Bachelor	
b.	Finished Primary School		f.	Degree of Master	
c.	Finished Secondary School		g.	Degree of Doctorate	
d.	SPM/STPM/Diploma		h.	Others Certificate:	

6. Year of participation in the Community Urban Agriculture Program (UAP): ______________

SECTION B: EVALUATION OF RESPONDENT TO THE URBAN AGRICULTURE PROGRAM (UAP)

No.	CONTEXT EVALUATION
1.	What are the main factors that motivated your participation in the UAP?
2.	Has your interest in gardening increased since joining the UAP?
3.	Have your objectives for joining the UAP been achieved?

No	INPUT EVALUATION
1.	What resources or inputs have you received as a participant in the UAP?
2.	Are the facilities and equipment provided by the DOA sufficient for the activities you've participated in within the UAP?
3.	Are the facilities and equipment provided by the DOA appropriate for the activities you've participated in within the UAP?
4.	Is the financial support and other assistance (e.g., advisory services) provided by the DOA sufficient for the UAP?

No	PROCESS EVALUATION
1.	Does the DOA regularly monitor the community garden areas?
2.	Are you satisfied with the knowledge provided on soil quality for urban farming?
3.	Do you voluntarily attend various courses to gain knowledge on planting activities?
4.	Does the community leader encourage members to gain technical knowledge, such as soil quality, fertilizers, and garden visits?

No	PRODUCT EVALUATION
1.	Are you satisfied with the implementation of the UAP so far?
2.	Are you satisfied with the additional income you've gained since joining the Urban Agriculture Program (e.g., savings on vegetable expenses)?
3.	Has your garden become more vibrant and cleaner since joining the Urban Agriculture Program?

No	UA PROGRAM EFFECTIVENESS
1.	Do you think the UAP should continue in the future? Can you suggest new elements to improve the program?
2.	How would you rate the overall UAP (stars)?
3.	Are you willing to continue your commitment to supporting the UAP? • Spend time • Promote the program to others • Are you willing to collaborate with external agencies? • Continue supporting and encouraging other family members to get involved

Thank You

BIODATA OF STUDENT

Munifah Siti Amira Bt Yusuf is a doctoral candidate in the Department of Agriculture Technology at the Faculty of Agriculture, Universiti Putra Malaysia (UPM). Born on March 15, 1992, in Alor Star, Kedah, Malaysia, she is the sixth of seven siblings in her family. She is the daughter of late Yusuf Bin Yeop and Maznah Bt Youb from Jitra Kedah, a small municipality in the state.

Munifah educational journey began at Sekolah Kebangsaan Sultan Ahmad Tajuddin, followed by her secondary education at MRSM Gerik, Perak, for her lower secondary years and MRSM Beseri, Perlis, for her upper secondary studies. She continued her academic path at UPM Serdang, enrolling in the Foundation of Agricultural Science program. With a scholarship from Jabatan Perkhidmatan Awam (JPA), she pursued and graduated with first-class honors in a Bachelor of Science in Horticulture from UPM in 2016. Motivated by a strong passion for research, Munifah embarked on her postgraduate studies, completing a Master's degree in Agricultural Extension at UPM between 2016 and 2018. Her academic pursuit continued with a Philosophy degree in Agriculture Extension at the same institution.

Throughout her years of success, Munifah has been grateful to be surrounded by positive individuals and an inspiring supervisor. She aims to contribute her knowledge to UPM, the nation, and the community through extension.

LIST OF PUBLICATIONS

Munifah, Y., Norsida, M., Bahiah, H., Ismi, A., Amar, M. (2024). Improvement Model Framework of Urban Agriculture Program in Malaysia: PLS-Sem Analysis. Sarhad Journal of of Agriculture (Scopus).

Munifah, Y., Norsida, M., Nur Bahiah, H., Ismi Arif, I., Amar, M., Aidi, A., Winoryantie, S. (2022). Examining the Trend of Social Science Research on Urban Agriculture: A Bibliometric Review. Central Asia and the Caucasus Journal (ERA).

Munifah, Y., Norsida, M., Nur Bahiah, H., Ismi Arif, I., Amar, M. (2022). Program Evaluation on Urban Agriculture Malaysia: A review of Evaluation Studies Using CIPP Evaluation Model Approach. International Journal of Special Education (ERA)

Munifah, **Y**., Norsida, M., Bahiah, H., Ismi, A., Amar, M. (2021). Evaluating Urban Agriculture Program Effectiveness Using CIPP Model: A Review. Paper presented in International Conference on Assessment and Development of Agricultural Innovation, Bogor, Indonesia. (Published in E-Proceedings (online) E3S Web of Conferences Forthcoming SCOPUS Indexed Proceeding).