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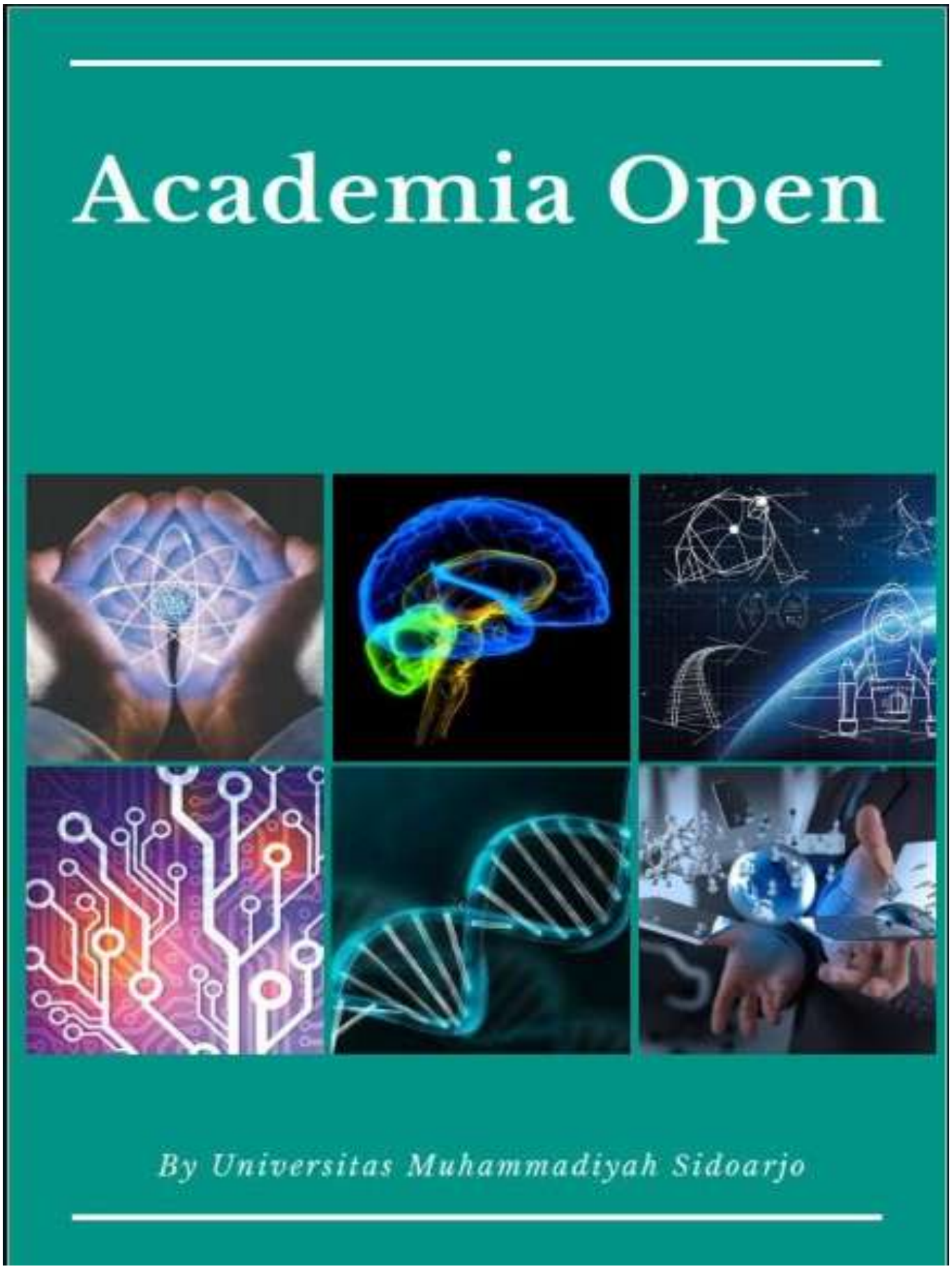

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Cultivating Competence: Bridging Professional Gaps in Bandung's Buruan SAE Urban Farming Program: Membangun Kompetensi: Menjembatani Kesenjangan Profesional dalam Program Pertanian Perkotaan SAE Buruan, Bandung

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Abstract

General Background Urban farming programs require adaptive human resource competencies to support food security and communityempowerment in complexenvironments. **Specific Background** This study examines agricultural extension workers within an urban farming program, focusing on competency alignment with role demands across different job levels. **Knowledge Gap** Limited evidence exists on how competency gaps are systematically mapped and translated into operational development strategies in urban agriculture contexts. **Aims** The study aims to identify competency gaps and formulate a structured competency development framework based on empirical findings. **Results** Findings reveal consistent gaps where competency achievement falls below importance levels, particularly in agribusiness management, agroprocessing, commercialization, institutional development, and technology facilitation, while communication and leadership competencies remain relatively strong. These gaps vary by job level, with higher-level roles demonstrating more complex deficiencies.Importance–PerformanceAnalysishighlightspriority competenciesrequiringimmediate attention. **Novelty** The study integrates job-level competency gap mapping with Importance–Performance Analysis and operationalizes the results into a 70:20:10 learning framework for targeted capacity development. **Implications** The findings suggest that competency development must be differentiated by role complexity and prioritize strategic technical skills through experiential, social, and formal learning to support sustainable urban farming programs.

Highlights
- Strategic technical competencies show the largest performance gaps
- Priority skills cluster in agribusiness, processing, and technology facilitation
- Development strategy aligns learning modes with competency gap structure

Keywords
Agricultural Extension; Competency Gap; Urban Farming; IPA Analysis; Learning Model

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INTRODUCTION

The quest to ensure food self-sufficiency is considered to be an essential factor in national security and economic growth in many countries, especially in developing economies like Indonesia [1] [2]. When considered in relation to urban settings, the "Buruan SAE" program in Bandung City can be considered a strategic innovation directed towards ensuring food security in addressing nutritional problems like stunting through integrated urban farming practices in residential areas. However, before intervening in agricultural practices in Indonesia and shifting to new and technologically driven urban farming models like SAE, there is a need to develop a human resource base capable of addressing the complexities of urban metabolisms [3]. Although such programs concentrate on noble causes in ensuring that nutritional problems like stunting in Indonesia are addressed constructively, it has often resulted in poor outputs due to policy implementation that does not align with the needs of the participants, indicating an improved need to mediate through human resources.

Agricultural extension service workers serve as a vital link between the governmental policies regarding the provisions of food security and the actual productivity of the farming community [4] [5]. Investigations have pointed out the results of these extension service workers, based on the specific dimensions of facilitating activities as well as technical knowledge supply, as a determining aspect of the participation level of the farming community. Extension services from the viewpoint of meeting the needs of the farming community are considered to contribute favorably towards the actual productivity of the farming community, thereby promoting the self-sufficiency of the region regarding the provisions of foodstuffs. However, there are challenges to the effectiveness of these service workers.

The increasing disconnection between the theory of human resource management frameworks and application in the field is a glaring indicator that a critical competency is still lacking [6] [7]. Though the theory of human resource development (HRD) is accepted for the purpose of greater organizational and individual efficiencies [8], the reality is that HRD, by virtue of application, often exists in a vacuum without connection to the particular skills that need to be developed to prepare for the future [9] [10]. This is particularly the case for the agricultural sector, for which a movement exists between the traditional training methodologies for extension agents and the emergent needs of the urban farmer[11], who requires unique competencies to engage in technology and participatory planning. In the absence of a generic but scientific approach to a competency framework, weighted ratings remain elusive.

Thus, intending to revitalize the Buruan SAE program and foster sustainability, it becomes critical to execute a strategy towards the development of human resources in the region. Under the "Theory of Change," Bandung City can be able to determine what needs to be in place to ensure the workforce is effective. This way, the competency gap in extension workers can be easily understood, and developing a strategy to bridge the gap can be facilitated. For instance, through effective training and career development opportunities, the agricultural extension workforce of Bandung City can be transformed into a high-performance workforce. Notably, the emphasis of the competency gap is not only a necessity but a strategic importance in realizing the potential of urban farming in the pursuit of food independence and social justice.

The implementation of the Buruan SAE Program across various areas of Bandung City directly involves local communities through the establishment of garden groups at the Rukun Warga level as part of an urban food management empowerment initiative [12] [13]. The Buruan SAE program still lacks consistency in mentoring, strength in implementation coordination, and capacity of human resources involved in group management and mentoring activities. The successful implementation of the program is linked to the role of agricultural extension workers as the primary actors in mentoring urban communities. To ensure the sustainability of the program, technical skills are required in cultivation mentoring, group facilitation, communication, planning, coordination, and decision-making.

Because of the differences in role complexity, it warrants an examination of agricultural extension workers at Level 3 and Level 6. Extension workers on Level 3 focuses on the technical execution of operational assistance of a group level, while Level 6 extension workers focuses more on strategic functions such as program planning, cross-stakeholder coordination, and oversight of the Buruan SAE Program implementation. These role distinctions imply corresponding differences in the competency requirements expected at each job level. Variations in competency requirements across job levels, therefore, require a clear standards-based reference to assess the adequacy of agricultural extension worker competencies. The classification of agricultural extension worker job levels is regulated under the Indonesian National Qualification Framework (KKNI) for agricultural extension, which defines role levels, responsibilities, and task complexity according to job level [5] [11]. In parallel, the Indonesian National Work Competency Standards (SKKNI) for Agricultural Extension specify competency units, competency elements, and performance criteria as objective measures of extension workers' capabilities in carrying out their mentoring functions.

However, it remains unclear to what extent the competencies of agricultural extension workers meet national competency standards in supporting a sustainable implementation of the program. This means that a job-level-based analysis of competency is crucial to assess the gap between actual and expected competencies in supporting the sustainability of the Buruan SAE Program in Bandung. In the program, field-level mentoring is done by agricultural extension workers with varying roles and responsibilities, this indicates differing competency requirements. Therefore, the capacity and competencies of agricultural extension workers at each level warrant systematic review to support the sustainability of the Buruan SAE Program. Insufficient competence in performing these functions may result in activities stagnating at the early stages of group formation and failing to develop into sustainable practices.

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Figure 1. *Retention Rate of Buruan SAE Program*

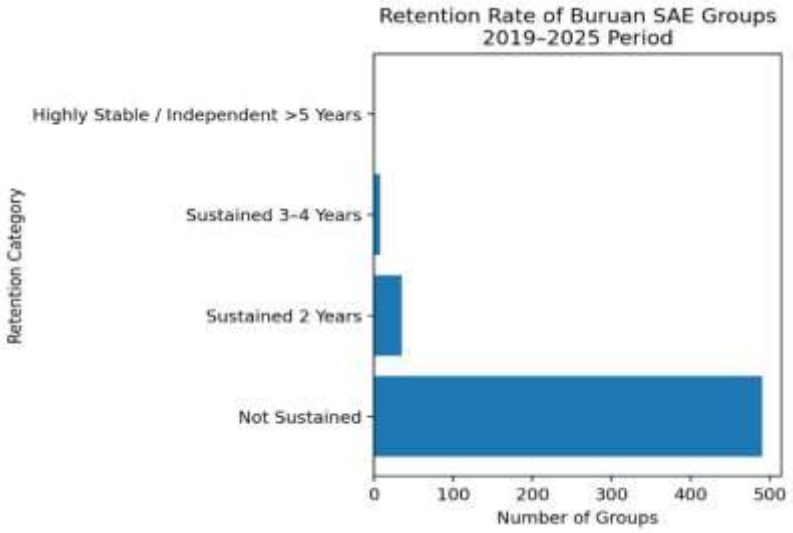

Figure 1 shows the retention rate of Buruan SAE groups in Bandung City during the 2019–2025 period [2]. Of all groups formed, most were unable to sustain their activities beyond two years. Only a very small number of groups reached the highly stable or independent category with sustainability exceeding five years. Descriptively, these data indicate that the sustainability of Buruan SAE groups remains a challenge in program implementation. The relatively high level of group formation in the initial phase was not followed by the groups' ability to maintain activities over the medium and long term.

The competency analysis approach was selected because competency represents an individual's professional capability, encompassing the knowledge, skills, and work attitudes required to perform roles and responsibilities in accordance with job requirements [6] [14]. Unlike performance, which may be influenced by various external factors, competency can be measured more objectively against established standards. Therefore, competency assessment constitutes an appropriate approach for evaluating the alignment between the capacities of agricultural extension workers and the implementation demands of the Buruan SAE Program. This competency analysis focuses on Level 3 and Level 6 agricultural extension workers involved in the implementation of the Buruan SAE Program in Bandung City, to evaluate the alignment between their competencies and the demands of their field-level mentoring roles, as well as to support the formulation of a competency development strategy oriented toward program sustainability.

This study offers a unique contribution by applying a standards-based competency gap analysis across job levels of agricultural extension workers using IPA mapping and linking the priority gap results directly to a structured competency development strategy. While previous competency studies that primarily focus on measurement, this research integrates SKKNI-based indicators, job-level differentiation, and IPA prioritization into an operational 70:20:10 development framework.

Method

This study employs a mixed methods approach using a sequential explanatory design [15], which was implemented through two main stages: a quantitative stage followed by a qualitative stage. This approach is intended to identify competency gaps among agricultural extension workers and to formulate competency development strategies based on the results of both quantitative and qualitative in-depth analyses. The first stage aims to measure the level of competency gaps among agricultural extension workers by comparing the level of competency importance with the level of competency achievement.

The research subjects comprised all Level 3 and Level 6 agricultural extension workers involved in the Buruan SAE Program in Bandung City, using a total sampling technique. The data was collected using a five-point Likert scale questionnaire developed based on the Indonesian National Work Competency Standards (SKKNI). The study variables consist of two main variables: competency importance (importance) and competency achievement (performance). The research instrument was tested for empirical validity using corrected item–total correlation and the Cronbach's Alpha coefficient to ensure internal consistency. Items were evaluated using a corrected item-total correlation threshold of 0.30. Even though several items showed coefficients below this statistical cutoff, they were retained because they were directly derived from nationally standardized SKKNI competency indicators, which preserves content validity.. Reliability testing produced very high Cronbach's Alpha coefficients, namely 0.979 (achievement Level 3), 0.988 (achievement Level 6), 0.983 (importance Level 3), and 0.988 (importance Level 6), indicating strong internal consistency of the instruments. Quantitative data were analyzed descriptively by calculating mean scores, conducting gap analysis, and performing Importance–Performance Analysis (IPA) mapping, which was used in previous studies [16–18], and based on the context of this study, IPA is used to determine competency development priorities.

The second stage (qualitative) was conducted to further deepen and explain the results of the quantitative analysis, particularly for competency indicators that showed high gaps and were classified within the priority quadrant of the Importance–Performance Analysis (IPA). Qualitative data were collected through in-depth interviews and document review involving purposively selected informants. The qualitative data were analyzed through stages of data reduction, data display,

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and conclusion drawing. The results of the qualitative analysis were then used to formulate a competency development strategy for agricultural extension workers based on the 70:20:10 learning framework [16] [17]. The competency gap was calculated using the following formula:

$$GAP\ i = C\ i - K\ i$$

Information:

GAP_i= competency gap for indicator *i*

C i = competency achievement value for indicator *i*

K i = competency importance value for indicator *i*

The validity of qualitative data was ensured through the application of trustworthiness principles, including credibility, transferability, dependability, and confirmability. The study subjects consisted of agricultural extension workers involved in the implementation of the Buruan SAE Program in Bandung City, comprising Level 3 and Level 6 extension workers in accordance with the provisions of the Indonesian National Qualification Framework (KKNI) in the field of agricultural extension [5] [11] [18]. Differences in job level reflect differences in task complexity, responsibilities, and required competencies in the implementation of extension activities. The program is implemented across various locations within the area of Bandung, which is characterized by diverse social and environmental conditions. These conditions need agricultural extension workers to possess contextual technical and non- technical competencies, which includes community mentoring abilities, extension communication skills, and participatory activity management capabilities. Out of the 21 extension workers under the coordination of the Bandung City Food Security and Agriculture Service in this study, 20 of them are agricultural extension workers. All respondents completed the research questionnaire, which formed the basis for the competency level and competency gap analysis conducted in the subsequent stage.

Results and Discussion

A. Competency Gap of Agricultural Extension Workers in the Buruan SAE Program

The quantitative analysis results indicate that competency gaps constitute a consistent phenomenon in the implementation of the Buruan SAE Urban Farming Program. For most of the measured competency indicators, the achievement level is below that of the required importance level. These r esults indicate that although these competencies are rated as important for supporting the effectiveness of extension workers' roles, their mastery level is not optimal. From a scientific point of view, this competency gap indicates that there is an unbalance between role demands and individual capacity, which is a phenomenon often noted in organizations that work within rapidly changing work environments [22, 23]. The Buruan SAE Program places agricultural extension workers within complex working environments that include urban agriculture settings with limited land availability, diverse social groups, and sustainability challenges. These working environments have created a need for adaptive competencies, although development of competencies has not kept pace. demands. These conditions increase the need for adaptive and contextual competencies, while competency development practices have not fully kept pace with these dynamics.

B. Determination of Priority Competencies for Development Based on Importance–Performance Analysis (IPA)

The mapping using the Importance-Performance Analysis (IPA) method provides a visual illustration of each of the competencies' indicators based on their importance and achievement levels. The result of the analysis revealed that some of the indicators are located in the top priority quadrant of the IPA matrix, indicating that these are critical areas for extension tasks' implementation. The competencies are critical for the effectiveness of the Buruan SAE program; however, these have not been adequately developed. Consequently, gaps in these priority competencies directly affect the quality of mentoring, coaching, and community capacity-building activities.

These findings support the principle that competency development should be conducted selectively based on priority gaps [19] [20]. IPA mapping helps identify competencies that generate the greatest performance leverage for extension workers [21]. Consistent with prior extension and community empowerment studies already cited in this paper, strategic and adaptive competencies tend to show the highest gap positions. The detailed IPA mapping results are presented in Table 1.

Table 1. *Importance–Performance Analysis (IPA) Mapping Results*

IPA Quadrant	Quadrant Characteristics	Dominant Competency Groups	Development Implications
Quadrant I (Top Priority)	High importance – Low achievement	Agribusiness, agroprocessing, agribusiness commercialization, institutional development, technology facilitation	The primary focus of competency development is on the most significant gaps and their direct impact on program effectiveness.
Quadrant II (Maintain Performance)	High importance – High achievement	Extension communication, leadership, work networking, and integrity	Competencies are well-developed and should be maintained through continuous strengthening
Quadrant III (Low Priority)	Low importance – Low achievement	Specific technical planning and evaluation competencies	Development can be carried out gradually in accordance with organizational needs

Quadrant IV (Optimal / Excessive)	Low importance – High achievement	Specific technical–operational competencies	Development resources should be adjusted to focus more on priority competencies.

Based on the results of the Importance-Performance Analysis (IPA) mapping shown in Table 1, some strategic competencies are located in Quadrant I, where importance is high and achievement is low, which include agribusiness, agroprocessing, agricultur commerce, institutional development, and technology facilitation. This indicates a competency gap in areas that have a direct impact on the effectiveness of the Buruan SAE Program. The competencies include the expanded role of agricultural extension workers in urban agriculture. However, current competency achievement in these areas remains relatively low, indicating limited capacity to support agribusiness-oriented urban agriculture transformation.

This gap condition is closely related to the higher complexity of urban agriculture compared to rural contexts, including land constraints, social diversity, and policy integration demands. This pattern is consistent with prior studies showing that urban extension roles require multidimensional competencies that are often not fully supported by conventional capacity development systems [11] [5] [4].

C. Competency Gap Patterns and Trends

The competency gap pattern shows that strategic technical competencies tend to exhibit higher gap levels than non-technical competencies. Domains related to agribusiness, agroprocessing, commercialization, and technology facilitation demonstrate lower achievement relative to their importance levels. This pattern reflects a mismatch between existing competency development emphasis and expanded role demands in urban agriculture, where extension workers are expected to support value addition, institutional strengthening, and technology adoption. Similar patterns have been reported in prior extension competency studies [3] [18] [22]. A summary of competency gap levels is presented in Table 2.

Table 2. *Summary of Agricultural Extension Worker Competency Gaps in the Buruan SAE Program*

Competency Group	Gap Level	Scientific Findings Characteristics	Implications for Program Implementation
Agribusiness & Agribusiness Commercialization	High	Competency achievement is lower than the corresponding importance level	Constrains value-added strengthening, marketing performance, and the sustainability of urban agricultural enterprises
Agroprocessing	High	Product processing skills are not yet aligned with program requirements	Limits product diversification potential and improvements in community income
Farmer Institutional Development	High	Group facilitation and organizational strengthening capacities remain limited.	Target group independence and sustainability are difficult to achieve
Innovation & Technology Facilitation	High	Adoption of urban agricultural technology remains uneven	Technical innovation has not been fully implemented at the community level
Extension Communication & Networking	Low	Competency levels are relatively good and aligned with importance levels	Supports the effectiveness of mentoring and community interaction
Leadership & Professional Ethics	Low	Non-technical competencies are well developed	Strengthens social capital in field-level program implementation

Based on the competency gap summary in Table 2, the most pronounced gaps are concentrated in strategic technical competencies, particularly agribusiness, agroprocessing, agricommerce, institutional development, and technology facilitation. These areas are directly related to value-added development, business sustainability, and transformation of the urban agriculture system, but the mastery of these areas by extension workers remains limited. This technical competency of extension workers is closely related to the complexity of urban agriculture, which not only calls for the extension worker to provide guidance on cultivation but also to act as a business developer, innovator, and institution builder. The capacity development systems that exist are not contextual enough, which affects the extension worker's ability to translate programs and policies into practice. On the contrary, non-technical competencies like extension communication, leadership, and professional ethics have relatively low gap levels, which indicate sufficient interpersonal and relational competencies among extension workers. Such strengths in mentoring continuity and building community trust in the Buruan SAE Program would not entirely mitigate the strategic technical competency gaps.

This differentiated gap pattern between technical and non-technical competencies supports prior findings that urban extension roles require more integrated and adaptive competency development approaches [13], [14], [15]. Accordingly, these results emphasize that capacity development strategies should strengthen not only soft skills but also strategic technical competencies aligned with urban agriculture and regional policy demands.

D. Competency Gaps Based on Job Level

The results show clear differences in competency gap patterns between Level 3 and Level 6 extension workers, reflecting variations in role complexity, responsibilities, and performance expectations. Higher job levels are associated with more strategic functions and correspondingly more complex competency gaps. This indicates that uniform competency development approaches are unlikely to be optimal, and development strategies should be aligned with job level to better address actual role demands. This pattern is consistent with career-level–based competency development frameworks that emphasize differentiated development strategies according to responsibility levels [23] [19] [6].

E. Synthesis of Quantitative Findings

Overall, the quantitative results show that competency gaps among Buruan SAE extension workers can be systematically identified and prioritized using IPA-based analysis [12] [13]. The findings confirm that competency development should focus on high-importance–low-achievement areas while accounting for job-level differences. Quantitative results form the basis for the next phase, which is qualitative, focusing on the underlying causes, as well as the design of contextual and sustainable competency development strategies.

F. Qualitative Findings on the Implementation of Agricultural Extension Worker Competencies

The qualitative study revealed that the implementation of agricultural extension worker competencies in the Buruan SAE Program was affected by individual capacity, program demand, and structural-organizational factors. All informants emphasized that communication competency is the most frequently applied skill in extension practice and serves as the primary basis for engaging diverse urban communities and delivering technical guidance. These competencies are largely strengthened through field experience.

In institutional development and community empowerment, informants reported that farmer group and urban farming community strengthening requires facilitation, managerial, and leadership competencies. Although, these are considered essential, Their development is often limited by time constraints, workload, and limited structured capacity building.

With regard to agribusiness and agroprocessing management competence, the informants indicated that these competencies cannot be optimally applied in urban agriculture settings because of limited market access, capital, and technology. Additionally, they cannot be applied because extension workers's roles in these contexts are facilitative rather than technical-operational. Therefore, the chances to develop these competencies in urban agriculture settings are limited. The interview results also indicated that digital technologies have been increasingly used to share information and facilitate coordination. However, their integration in program planning, monitoring, and evaluation is limited. The informants also pointed out structural/institutional factors that affect the implementation of extension duties. Administrative workload, time constraints, and limited policy support were identified as key barriers to comprehensive competency application. These findings indicate that competency development must be addressed within broader organizational and policy system contexts.

G. Synthesis of Quantitative and Qualitative Results

The integrated analysis of quantitative and qualitative findings shows consistent competency gap patterns across measurement results and field experience. Gap and IPA mapping results on both Level 3 and Level 6 Extension Workers show that there are identified priority competencies that have high importance and low achievement. These priority competencies are mostly those included in Quadrant I and some in Quadrant III that are yet to be optimally realized in Extension Work.

Qualitative interview results also affirm the gap results quantitatively that some priority competencies have yet to be optimally implemented in practice. Informants at Level 3 reported that extension activities are still dominated by basic technical assistance and community communication, limiting the development of managerial and strategic competencies. This aligns with the measured gaps in agribusiness management, institutional development, and technology facilitation.

At Level 6, larger competency gaps appear in agribusiness development, agroprocessing, and strategic planning domains. The findings from the interviews reveal a link between the gaps in the identified areas and structural constraints at the community level, which include limited market access, institutional support, and resources, as well as the facilitative and coordinative role of extension workers. These factors can be linked to the gap level in the strategic competencies, as revealed in the measurement results.

On the other hand, the findings from the IPA mapping reveal a high level of importance and achievement in the communication, leadership, and integrity competency areas, as indicated in Quadrant II. The findings from the interviews also reveal a high level of application of the identified competency areas in interactions with the community, as indicated in the findings. The lower priority competency areas, as revealed in Quadrants III and IV, indicate a low level of development, mainly due to time constraints and administrative work..

Overall, the integrated findings show that competency gaps among Buruan SAE extension workers are not only technical but also structural and contextual. While basic operational competencies are relatively well developed, strategic, managerial, and agribusiness competencies require strengthening through more integrated and context-responsive capacity development.

H. Basis for Formulating Competency Development Strategies

The 70:20:10 model [16] [17] was adopted as an implementation-oriented framework aligned with the learning characteristics of agricultural extension workers. The competency development strategy employed in this study was developed through an integration of the results of the quantitative gap analysis, IPA mapping, and qualitative interview analysis. The analysis of the results of the study indicates that there are priority competency gaps at the Level 3 and Level 6 extension worker levels. This analysis provides an empirical base for developing a differentiated competency development strategy depending on the position of the competency gaps and the role demands.

The interview analysis indicates that there are underlying causes of competency gaps, including limited practice exposure, lack of a structured learning environment, and limited collaborative learning for extension workers. This indicates that the competency development practice has not yet fully aligned with the role demands at the field level. This evidence justifies the need for a differentiated competency development strategy for Level 3 and Level 6 extension workers. According to the interview analysis, the competency development practice has largely been formalized, with experiential learning not yet fully structured. Informants reported that significant competency gains often occur through field practice, mentoring by senior extension workers, and peer knowledge sharing. These patterns align with the multi-mode learning structure of the 70:20:10 model [12], which combines experiential, social, and formal learning approaches.

1. Work Experience–Based Competency Development Strategy (70%)

Competencies in Quadrant IV show relatively strong achievement or lower priority gaps and can be further strengthened through experiential reinforcement. Significantly negative differences in agribusiness, institutional development, strategic planning, and technology facilitation competencies at both Level 3 and Level 6 of the GAP and IPA have been established. Since there is a need for conceptual clarity, standardization, and technical frameworks in these areas, experiential learning strategies are emphasized. This corresponds to the 70% experiential learning component of the 70:20:10 model [19,20].

2. Social Learning–Based Competency Development Strategy (20%)

Competencies in Quadrants II and III show moderate-to-adequate achievement but still require reinforcement and alignment with role demands. Interview findings indicate that extension workers frequently strengthen these competencies through peer interaction, mentoring, and collaborative problem solving, although these mechanisms are not yet systematically organized. Development strategies in these quadrants therefore emphasize structured social learning through mentoring and coaching systems, communities of practice, focused group discussions, and peer knowledge-sharing forums. This aligns with the 20% social learning component of the 70:20:10 model [16] [17].

3. Formal Learning Based Competency Development Strategy (10%)

Competencies in Quadrant I demonstrate high importance but low achievement and therefore require structured strengthening. Interview evidence shows that sustained competence in these areas is maintained through continuous field practice and role execution. Accordingly, development strategies emphasize formal learning through expanded technical training, applied workshops, and structured learning programs.

This reflects the 10% formal learning component of the 70:20:10 model [19,20], where competence is reinforced through targeted formal development.

This formulation shows that the proposed competency development strategy is empirically grounded and field-based. It differentiates development focus by job level, with Level 3 emphasizing technical and operational competencies and Level 6 emphasizing strategic, managerial, and agribusiness-oriented competencies. The 70:20:10 model [16] [17] therefore functions as an implementation framework for delivering contextual and adaptive competency development aligned with field needs.

To develop a competency planning process for Buruan SAE extension workers, a more innovative extension training process, based on the 70:20:10 learning framework, should be considered. In this framework, the experiential learning components of extension worker competency development will include a focus on structured on-the-job assignments, projects, and problem-solving activities related to urban farming.

The 20% social learning components of the framework will focus on strengthening the collaborative competency development process. The research has identified that extension worker competency development, through a process of mentoring, peer discussion, and shared problem-solving, has a strong likelihood of occurring, but this process has not been well-structured. The strategy will, therefore, focus on developing a more structured mentoring process.

The 10% formal learning component of the framework will provide a more focused process for addressing priority competency gaps identified through GAP and IPA analysis. The focus of formal learning will be on developing a more structured process related to technical training, updated standards, digital extension, and performance management. This will provide a more direct correlation between formal learning content and the competency gaps that need to be addressed.

Conclusion

The results demonstrate a clear mismatch between evolving role demands and current competency achievement among agricultural extension workers involved in urban farming programs. Importance–Performance Analysis shows that interpersonal and communication competencies are relatively strong, while substantial gaps persist in strategic technical competencies, particularly in agribusiness development, commercialization, and innovation facilitation. These gaps are shaped by individual capability limitations and structural and capacity-building patterns that remain mostly oriented towards conventional rural technical models. Differences in gap patterns between Level 3 and Level 6 indicate that competency needs increase with how complex the role is. These findings validate that uniform professional development approaches are not enough for high-complexity urban agriculture contexts. Competency development should then be differentiated by job level and gap priority, combining experiential, social, and targeted formal learning using a gap-based 70:20:10 framework. This approach supports the gradual strengthening of extension workers' roles from primarily technical advisors towards more strategic program facilitators. Future research should evaluate the impact of gap-based experiential and social learning

interventions on extension practice outcomes and further examine the contribution of digital extension systems and updated competency standards in urban agricultural settings.

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