



## Reframing Agricultural Extension in Urban Sustainability: The Role of Extension Agents in Strengthening Women-Led Urban Farming Institutions

Unang<sup>1\*</sup>, Tedi Hartoyo<sup>2</sup>

Agribusiness Department Siliwangi University Indonesia

**Corresponding Author:** Unang [uatmaja@gmail.com](mailto:uatmaja@gmail.com)

---

### ARTICLE INFO

*Keywords:* Agricultural Extension, Institutional Development, Women-Led Institutions, Urban Agriculture, Urban Sustainability

*Received:* 18, December

*Revised:* 19, January

*Accepted:* 28, February

©2026 Unang, Hartoyo: This is an open-access article distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/).



### ABSTRACT

This study examines how agricultural extension contributes to institutional development in a women-led urban farming group, using KWT Sahabat Sampah in Bekasi City as a case study. The group integrates waste management and hydroponic vegetable production, illustrating an emerging model of community-based urban sustainability. A descriptive quantitative approach was employed, with all 35 members participating through census sampling. Data were collected via structured questionnaires, field observation, and interviews with the assigned extension agent. Results indicate that extension support was consistently rated high across six dimensions, particularly facilitation. Institutional development indicators were likewise strong, though economic sustainability remains constrained. Spearman's rank correlation ( $\rho = 0.678$ ,  $p < 0.01$ ) shows a substantial association between extension intensity and institutional development. These findings suggest that participatory, context-sensitive extension approaches are well-suited to urban settings and can strengthen women's organizations as local sustainability actors.

---

## **INTRODUCTION**

Rapid urbanization in developing countries has exposed the limitations of agricultural extension models historically designed for rural production systems. Urban areas face mounting environmental pressures, particularly from unmanaged household waste, which strains municipal services and threatens public health. In Bekasi City, Indonesia, approximately 1,800 tons of household waste are generated daily, with nearly 70 percent not reaching formal recycling facilities (Leng & Arif, 2022). Similar patterns have been observed in other rapidly growing urban areas, where inadequate collection systems and limited community participation hinder effective waste management (Bremer, 2020; Ferronato et al., 2023; Singh et al., 2014).

Although Indonesia's Waste Management Law (No. 18/2008) promotes the 3R principles—reduce, reuse, recycle implementation at the local level remains uneven. Weak institutional coordination and limited civic engagement hinder the effective implementation of regulatory frameworks into sustained practice. Within this context, women's farmer groups (Kelompok Wanita Tani, KWT) have begun expanding their roles beyond household food production toward environmental action, combining food security, resource recovery, and neighborhood engagement.

Initially focused on backyard cultivation and food processing, many KWT groups have diversified into waste reduction and small-scale recycling initiatives. As noted by Alfiyani et al. (2024), women-led farmer organizations can serve as entry points for environmentally responsible practices within communities. KWT Sahabat Sampah in Bekasi illustrates this shift. Established in 2019, the group transformed a former illegal dumping site into a functioning waste bank and hydroponic growing space. Members separate recyclable materials, compost organic waste, and cultivate vegetables for local markets. Their activities link environmental management with income generation, positioning the group as both a social and ecological actor.

Conventional extension systems have concentrated on improving agricultural productivity in rural settings. Urban environments, however, require a broader skill set. Extension agents must navigate spatial constraints, overlapping regulatory regimes, and diverse stakeholders while addressing cross-sectoral concerns such as sanitation and public health. Leeuwis and Van den Ban (2021) emphasize participatory approaches that shift extension from one-way technical transfer toward collaborative learning. Such methods align more closely with the informal and self-organized character of urban community groups.

From an institutional perspective, extension can be interpreted as a form of institutional work. Lawrence and Suddaby (2006) describe institutional work as the purposive actions undertaken by actors to create, maintain, or transform institutions. In urban community settings, where rules and organizational routines are still emergent, extension agents may contribute not only technical expertise but also normative stabilization. Through repeated facilitation, coordination, and recognition, extension engagement helps consolidate collective practices into durable institutional arrangements.

Institutional development in this study is approached not merely as organizational performance, but as an ongoing process through which shared rules, roles, and expectations are negotiated. Following participatory development perspectives, institutions are sustained not only by formal structures but by repeated interaction, mutual trust, and the perceived fairness of decision-making procedures. This perspective allows institutional capacity to be read not simply as efficiency, but as the durability of collective commitment.

## LITERATURE REVIEW

Despite growing interest in urban agriculture, empirical research still concentrates largely on rural productivity outcomes (Tamrin, 2022; Tumbel et al., 2024). The interaction between women-led institutions, environmental management, and extension services in urban contexts remains underexplored. By situating urban extension within institutional work and collaborative governance perspectives, this study contributes to extension scholarship by reframing extension as an actor in local institutional consolidation rather than merely a technical advisory service. This study addresses that gap by examining how extension engagement relates to institutional development in an urban KWT integrating agriculture and waste management.

The research pursues three objectives:

- (1) To assess the multidimensional role of the extension agent;
- (2) To evaluate the institutional development of KWT Sahabat Sampah, and
- (3) To test the association between extension engagement and institutional development.

## METHODOLOGY

### Study Design and Site

A descriptive quantitative design with a single-case focus was employed. The case was selected for its analytical relevance rather than statistical representativeness. KWT Sahabat Sampah, located in Harapan Jaya Village, North Bekasi District, represents an established women-led urban farming group integrating waste management and agricultural production under active extension involvement. The group was purposively chosen based on three criteria: sustained engagement with extension services, integration of agricultural and waste-management activities, and the presence of a structured organizational system. It consists of 35 members, primarily homemakers, who manage a waste bank and hydroponic facility on converted public land.

### Sampling and Data Collection

Given the small population, all 35 members were included through census sampling. Data were collected between February and March 2025 using three methods: structured questionnaires, participant observation, and semi-structured interviews with the extension agent. The questionnaire applied a three-point Likert scale to measure perceptions of extension performance and institutional functioning.

## **Measurement**

Two constructs were assessed. The extension agent's role was measured using six dimensions derived from Van den Ban and Hawkins (1999): education, information dissemination, facilitation, consultation, supervision, and evaluation. Institutional development followed Mardikanto and Soebiato (2017), covering decision-making participation, program implementation, monitoring and evaluation, and benefit utilization.

Validity was confirmed through expert review and item-total correlations (0.52–0.79). Reliability testing produced Cronbach's alpha values of 0.89 for the extension role and 0.86 for institutional development.

## **Analysis**

Descriptive statistics were used to summarize scores. Categories were defined as low (1.00–1.66), moderate (1.67–2.33), and high (2.34–3.00). Spearman's rank correlation tested associations between variables at a 0.05 significance level (Hartoyo, 2025; Hartoyo et.al., 2025).

## **RESULT AND DISCUSSION**

### **Extension Agent Performance**

All six extension dimensions were rated in the high category, with facilitation receiving the highest mean score ( $M = 2.74$ ). Consultation scored lowest yet remained strong ( $M = 2.49$ ). Overall perception of extension performance was positive ( $M = 2.56$ ).

The prominence of facilitation suggests that extension in this setting functions less as directive authority and more as negotiated coordination. The agent convened meetings, connected the group with municipal waste programs, and assisted in securing access to public land, enabling members to make decisions suited to local conditions. Rather than prescribing solutions, the extension process redistributed decision-making authority within the group. Such a role challenges conventional hierarchies embedded in state-led extension systems and aligns more closely with collaborative and participatory governance approaches (Leeuwis & Aarts, 2011).

Education scores were similarly high, though with greater variation. Training sessions on composting and hydroponic production were conducted regularly, yet absorption varied across members. Limited time for individualized guidance likely contributed to this dispersion, a common constraint in multi-group extension settings (Nettle et al., 2018).

### **Institutional Development**

Institutional indicators also fell within the high category. Decision-making participation and program implementation achieved the strongest scores, followed closely by monitoring and evaluation. Benefit utilization ranked slightly lower, indicating modest economic returns despite strong organizational cohesion.

Members actively debated crop selection and revenue allocation during meetings, reinforcing shared ownership. Leadership rotation further distributed authority and strengthened accountability.

Beyond internal governance dynamics, the fact that institutional strengthening occurred within a women-led collective is not incidental. Women's groups often occupy an ambiguous position within development policy recognized rhetorically yet under-supported structurally. In this case, extension engagement appears to legitimize the group's activities in the eyes of municipal authorities, thereby expanding its operational space. Institutional development, therefore, is intertwined with gendered recognition in local governance arenas.

However, income from vegetable sales primarily covered operational costs, limiting reinvestment capacity. Access to credit or municipal procurement schemes could enhance financial sustainability.

### **Association Between Extension and Institutional Development**

Spearman's analysis revealed a significant positive correlation between extension role and institutional development ( $\rho = 0.678$ ,  $p < 0.01$ ). While the cross-sectional design does not permit causal inference, the finding suggests that sustained extension engagement is associated with stronger organizational capacity within the group.

Urban community organizations operate within dense regulatory and social environments where access to land, permits, and institutional recognition often determines sustainability. In this case, the extension agent supported permit acquisition, facilitated linkages with municipal waste authorities, and connected the group to external training opportunities. These forms of coordination extended the group's operational space beyond its internal structure and positioned it more firmly within local governance networks.

Such dynamics can be interpreted through a collaborative governance perspective (Ansell & Gash, 2008), in which state and non-state actors interact within shared arenas of decision-making. Extension agents in this setting function as boundary actors who mediate between informal community initiatives and formal administrative systems. By translating local practices into administratively recognizable forms, extension engagement reinforces institutional legitimacy while reducing coordination gaps across sectors.

Beyond coordination effects, the observed relationship reflects processes that resemble institutional work. From an institutional perspective, extension activities resemble institutional work (Lawrence & Suddaby, 2006), involving purposive actions that stabilize shared norms, reinforce procedural routines, and consolidate emergent organizational arrangements. Through repeated facilitation and recognition, extension contributes to the gradual embedding of collective practices into durable institutional structures.

Reframing extension for urban sustainability therefore requires acknowledging its institutional character. When extension operates as a facilitator of collective action rather than solely as a transmitter of technical advice, it strengthens governance capacity at the community level. The

effectiveness of urban extension appears to depend not only on agronomic expertise but also on the ability to nurture stable, participatory, and legitimate institutional arrangements.

Limitations include the single-case design and reliance on self-reported perceptions. Future research may incorporate longitudinal approaches and objective performance indicators to further clarify the causal pathways linking extension engagement and institutional development.

## CONCLUSION AND RECOMMENDATION

This study demonstrates that extension services can contribute meaningfully to institutional development in women-led urban farming groups. Facilitation emerged as the most influential function, reinforcing participatory governance and external linkages. Although institutional indicators were strong, financial sustainability remains a challenge.

Urban extension requires competencies that extend beyond technical crop advice. Agents must navigate municipal systems, coordinate stakeholders, and support grassroots organizations. Strengthening women's groups engaged in integrated waste and food production can simultaneously advance environmental management and local economic resilience.

Policy measures should therefore include urban-oriented training modules, cross-sectoral collaboration between extension and waste management authorities, and accessible financing mechanisms to support organizational growth.

Urban sustainability ultimately depends not only on infrastructure and regulation, but also on capable community institutions. Extension services that adapt to this reality can play a strategic role in supporting neighborhood-level transitions toward more sustainable practices.

## REFERENCES

- Alfiyani, A., Sutarto, S., & Wijaya, R. (2023). Peran Kelompok Wanita Tani dalam peningkatan ekoliterasi masyarakat: studi kasus di perkotaan. *Jurnal Pemberdayaan Masyarakat*, 12(2), 145–160.
- Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4), 543–571. <https://doi.org/10.1093/jopart/mum032>
- Bremer, C. (2020). Not (B)interested? Using Persuasive Technology to Promote Sustainable Household Recycling Behavior. *Lecture Notes in Computer Science*, 195-207. [https://doi.org/10.1007/978-3-030-45712-9\\_15](https://doi.org/10.1007/978-3-030-45712-9_15)
- Ferronato, N., Maalouf, A., Mertenat, A., Saini, A., Khanal, A., Copertaro, B., ... & Mohandas, V. J. (2023). A review of plastic waste circular actions in seven developing countries to achieve sustainable development goals. *Waste Management & Research the Journal for a Sustainable Circular Economy*, 42(6), 436-458. <https://doi.org/10.1177/0734242x231188664>

- Hartoyo, T. (2025). Parametric and Nonparametric Statistical Tests. In Elmizen, G., H (Ed.). *Mathematical Statistics for Data Analysis* (Page: 163 - 198). Mawadra Lestari Enterprise.
- Hartoyo, T., Bambag, S. & Deasy, W. (2025). *Pengantar Metode Statistik*. Getpress Indonesia.
- Lawrence, T. B., & Suddaby, R. (2006). Institutions and institutional work. In S. R. Clegg et al. (Eds.), *The SAGE handbook of organization studies* (2nd ed., pp. 215–254). Sage Publications.
- Lawrence, T. B., Suddaby, R., & Leca, B. (Eds.). (2009). *Institutional work: Actors and agency in institutional studies of organizations*. Cambridge University Press.
- Leeuwis, C., & Aarts, N. (2011). Rethinking communication in innovation processes: Creating space for change in complex systems. *Journal of Agricultural Education and Extension*, 17(1), 21–36.
- Leeuwis, C., & Van den Ban, A. W. (2021). *Communication for rural innovation: Rethinking agricultural extension* (3rd ed.). Wiley-Blackwell.
- Leng, Y. Y. and Arif, A. M. M. (2022). E-Waste Recycling Behaviour with Reference to Consumers in Kuantan City. *International Journal of Academic Research in Business and Social Sciences*, 12(12). <https://doi.org/10.6007/ijarbss/v12-i12/16019>
- Mardikanto, T. E., & Soebianto, Y. (2017). Kerangka kelembagaan partisipatif untuk pemberdayaan petani. *Jurnal Agribisnis*, 10(1), 37–52.
- Nettle, R., Davis, K., & Klerkx, L. (2018). Knowledge systems brokers in agricultural innovation: A review. *NJAS - Wageningen Journal of Life Sciences*, 86–87, 64–76. <https://doi.org/10.1016/j.njas.2018.05.001>
- Singh, R. K., Yabar, H., Mizunoya, T., Higano, Y., & Rakwal, R. (2014). Potential Benefits of Introducing Integrated Solid Waste Management Approach in Developing Countries: A Case Study in Kathmandu City. *Journal of Sustainable Development*, 7(6). <https://doi.org/10.5539/jsd.v7n6p70>
- Tamrin, T. (2022). Efektivitas penyuluhan dalam meningkatkan produktivitas usahatani: meta-analisis. *Jurnal Penyuluhan*, 14(1), 65–80.
- Tumbel, P., Lumban, R., & Asnawi, M. (2024). Pemberdayaan KWT melalui penyuluhan pertanian partisipatif. *Jurnal Pembangunan Pertanian*, 15(1), 23–39.

*Unang, Hartoyo*

Van den Ban, A. W., & Hawkins, H. S. (1999). *Agricultural extension* (2nd ed.). Blackwell Science.