OKUL YÖNETİMİ
SCHOOL ADMINISTRATION JOURNAL [SAJ]
Cilt 6, 2026, ss. 1-15
İZ: https://izlik.org/JA99NR89UD

Araştırma Makalesi / *Research Article*

From plate to soil: Evaluating food waste through the bokashi method within a campus sustainability framework

Sabri Öz[*] [1] Serap Öztürk[**] Betül Gür[***]

[*]İstanbul School of Technology, İstanbul [**]Sabahattin Zaim University, Istanbul [***] İstanbul Ticaret University

ABSTRACT

This study examines the Bokashi method as a decentralized food-waste management practice within a university campus sustainability context. Based on a qualitative case study, it analyzes a 15-day pilot at İstanbul Ticaret University using observation, field notes, process documentation, and participant feedback. Findings indicate that the pilot failed to reach the intended fermentation outcome mainly due to excessive sawdust use, weak process standardization, and insufficient monitoring of moisture, sealing, and leachate formation. The study concludes that Bokashi can support circular campus practices when implemented through training, standardized protocols, and institutionally supported, context-sensitive design.

KEYWORDS: *Bokashi method; campus management; campus sustainability; circular economy; food waste.*

Tabaktan toprağa: Kampüs sürdürülebilirliği çerçevesinde bokashi yöntemiyle gıda atıklarının değerlendirilmesi

ÖZ

Bu çalışma, bir üniversite kampüsü sürdürülebilirlik bağlamında, merkezi olmayan bir gıda atığı yönetim uygulaması olarak Bokashi yöntemini incelemektedir. Niteliksel bir vaka çalışmasına dayanarak, İstanbul Ticaret Üniversitesi'nde 15 günlük bir pilot uygulama, gözlem, saha notları, süreç dokümantasyonu ve katılımcı geri bildirimleri kullanılarak analiz edilmiştir. Bulgular, pilot uygulamanın esas olarak aşırı talaş kullanımı, zayıf süreç standardizasyonu ve nem, sızdırmazlık ve sızıntı oluşumunun yetersiz izlenmesi nedeniyle amaçlanan fermantasyon sonucuna ulaşamadığını göstermektedir. Çalışma, Bokashi'nin eğitim, standartlaştırılmış protokoller ve kurumsal olarak desteklenen, bağlama duyarlı tasarım yoluyla uygulandığında döngüsel kampüs uygulamalarını destekleyebileceği sonucuna varmaktadır.

ANAHTAR KELİMELER: *Bokashi yöntemi; kampüs yönetimi; kampüs sürdürülebilirliği; döngüsel ekonomi; gıda atığı.*

[1] **İLETİŞİM** Sabri Öz ✉ soz.iticu@gmail.com

Geliş: 23.02.2026 **Kabul:** 20.05.2026 **Yayın:** 23.05.2026

Atıf: Öz, S., Öztürk, S., ve Gür, B. (2026). From plate to soil: Evaluating food waste through the bokashi method within a campus sustainability framework. *Okul Yönetimi (SAJ)*, *6*, 1-15.
İZ:https://izlik.org/JA99NR89UD

Introduction

The global rise in food waste has emerged as a major challenge to sustainable development due to its adverse effects on resource efficiency, climate stability, and biodiversity (Wang et al., 2020; Manisa et al., 2025). According to the Food and Agriculture Organization (FAO), almost one-third of all food produced globally is wasted, amounting to over 1.3 billion tons annually. A substantial share of this waste is ultimately disposed of in landfills, where anaerobic decomposition generates methane, a greenhouse gas with a significantly higher warming potential than carbon dioxide over the short term (Valeria & Mazzanti, 2012). Accordingly, the development of effective and context-sensitive food waste treatment strategies has become central to circular economy transitions and to the reduction of environmental burdens associated with organic waste streams.

Among various composting techniques such as hot composting, cold composting, and Oxigen-Required Aerobic Composting, the Bokashi method is a suitable, low-cost, low-technology, and odor-minimizing alternative for urban households, educational institutions, and decentralized communities (Pata et al., 2023). Originating in Japan, the term bokashi is commonly associated with the fermentation of organic matter. Derived from Japanese agricultural practices and developed with modern microbiological knowledge, Bokashi fermentation uses Effective Microorganisms (EM) to anaerobically degrade organic matter (Evcim & Gümüş, 2022). Unlike traditional aerobic composting, the Bokashi method allows for a wider range of organic inputs, including cooked foods, dairy products, and meat residues, making it particularly relevant in institutional environments such as school and university cafeterias (Destek et al., 2023).

However, the successful implementation of Bokashi systems depends not only on their technical properties but also on user behavior, the balance of input materials, training processes, and ongoing monitoring. These factors become even more critical in collaborative environments like university campuses, where large-scale adoption requires coordination, paticipant awareness, and methodological consistancy. Against this background, the present study is based on a Bokashi implementation workshop conducted within a Jean Monnet Project on circular economy and sustainability at İstanbul Ticaret University. The workshop served both as a practical pilot initiative and as an awareness-raising activity on campus (Yoleri, 2012). The project involved faculty, students, and sustainability volunteers collecting food waste from the campus cafeteria, layering it with Bokashi bran and sawdust in a closed container (fermentation bucket), and monitoring its transformation over time.

During the implementation, a major operational problem emerged: sawdust was used in excessive amounts as a substitute for Bokashi bran, disrupting microbial balance and preventing the fermentation process from progressing as intended.

Rather than obscure this situation, the current article treats it as a learning opportunity, analyzing what went wrong, what could be improved, and how bokashi systems could be better adapted to institutional settings. This approach aligns with the spirit of pragmatic sustainability research, where partial or unsuccessful interventions are equally valuable in identifying implementation barriers and improving policy frameworks.

In addition to the case study, the article provides a conceptual discussion of the Bokashi method and outlines its theoretical relevance within the fields of waste management and soil ecology. It also examines the role of composting in campus sustainability initiatives.

While the environmental benefits of Bokashi have been increasingly recognized, less attention has been paid to the practical difficulties of implementing Bokashi systems in institutional settings, particularly when user training, material balance, and process monitoring are insufficient. This study addresses that gap by examining a campus-based implementation experience and drawing lessons from an incomplete fermentation outcome.

To situate the case within the broader literature, the study reviews 38 international and national publications on Bokashi, including studies accessible through DergiPark and selected articles indexed in international citation databases. This literature points to a growing yet still fragmented body of knowledge on Bokashi practices, particularly in institutional and urban contexts. The findings from the Jean Monnet workshop are presented as a case study and are subsequently discussed in terms of practical limitations, participant behavior, and system-level adjustments required for more effective implementation.

Ultimately, the study offers recommendations to academia, public institutions, and private sector stakeholders to promote decentralized composting, reduce food waste at the source, and support soil regeneration through local organic cycles. In doing so, it contributes to the emerging literature that reconceptualizes food waste not as an endpoint of consumption, but as a resource that can help close local ecological and nutrient cycles.

Bokashi Composting: Conceptual and Technical Framework

Originating in Japanese agricultural practice, Bokashi has evolved into a fermentation-based organic waste treatment method that is increasingly discussed in relation to sustainable waste management. Unlike conventional aerobic composting, Bokashi is based on a predominantly anaerobic process and relies on effective microorganisms (EM) to ferment organic waste in sealed conditions. This microbial process helps reduce odor, enables the treatment of diverse food residues, and produces a pre-composted material that can later be incorporated into soil or secondary composting systems. Because of these

characteristics, Bokashi is often regarded as a promising option for small-scale and decentralized waste management in urban and institutional settings.

Core Principles, Materials, and Applications

This section outlines the required materials for Bokashi composting and explains the implementation process.

The Bokashi process is based on the interaction of three core elements: organic waste, microbial inoculants, and carbon-rich absorbent materials. Organic waste includes both raw and cooked food residues, such as vegetable scraps, dairy products, and meat remains, which constitute the primary substrate for fermentation. Bokashi bran, typically produced from wheat or rice bran inoculated with effective microorganisms and molasses, functions as the main microbial activator that initiates and sustains anaerobic decomposition. Additional absorbent materials such as sawdust, shredded paper, or similar carbon-rich inputs may be used in limited amounts to regulate moisture and improve texture, although their proportion must be carefully controlled.

In standard practice, these materials are added in layers to an airtight container and compressed to minimize air pockets. The fermentation period generally lasts around 10–14 days, depending on ambient conditions and the composition of the waste stream (Öztürk, 2025). During this phase, liquid leachate may accumulate at the bottom of the container, while the solid fraction becomes a fermented pre-compost material. After fermentation, this material is typically buried in soil or transferred to a secondary composting stage for maturation (Öztürk, 2025).

Bokashi composting typically requires an airtight container, fermented bran inoculated with effective microorganisms, and a regular supply of segregated organic kitchen waste. In standard practice, food residues are added in layers, compressed to reduce air exposure, covered with inoculated material, and sealed to maintain anaerobic conditions. Under suitable moisture and temperature conditions, fermentation begins within the first days of storage, and leachate may form depending on the water content of the waste. Once the fermentation stage is completed, the material is usually incorporated into soil or transferred into a secondary composting process for stabilization and humification.

Environmental Benefits

The Bokashi method offers several environmental and agronomic advantages compared to conventional composting techniques. Because the process is carried out in sealed conditions, Bokashi is often associated with reduced odor and better suitability for dense urban or institutional environments. It can also accommodate a broader range of food residues, including cooked and protein-rich waste streams that are often more difficult to manage through conventional

composting. In addition, the fermented output can contribute to soil improvement by supporting microbial activity and nutrient availability after soil incorporation. These characteristics make Bokashi relevant not only as a waste reduction tool but also as a component of localized circular resource management. Recent studies have suggested that Bokashi may contribute to the reduction of organic waste volumes and may support soil-related benefits when the fermented material is properly matured and applied (Fruet-Cardozo et al., 2025).

Limitations and Implementation Risks

Although Bokashi is often presented as a simple and accessible method, its successful operation depends on a relatively delicate balance between material composition, moisture conditions, microbial activity, and procedural consistency. Excessive use of absorbent materials, insufficient inoculation, poor sealing, and inconsistent layering practices may disrupt fermentation and reduce process stability. Likewise, inadequate training, weak monitoring routines, and inconsistent user participation can turn a technically feasible system into an unsuccessful institutional application (Pata et al., 2023; Gao et al., 2024).

For this reason, Bokashi should be understood not merely as a biological treatment technique, but as a socio-technical practice whose effectiveness depends on operational discipline, user capability, and institutional support. This issue becomes particularly visible in campuses and other collective-use environments, where participation, coordination, and standardization directly influence outcomes.

In decentralized composting systems, technical adequacy alone does not guarantee successful implementation. User capability, access to appropriate materials and infrastructure, and sustained motivation for procedural compliance all shape process outcomes. For this reason, Bokashi implementation in institutional environments can be interpreted not only through biological parameters, but also through behavioral and organizational conditions that affect whether the system is applied consistently and correctly.

Food Waste and Circular Economy in Institutional Contexts

Institutional settings such as universities, hospitals, and large public facilities generate considerable volumes of food waste on a daily basis. At the same time, these settings also provide important opportunities for the practical application of circular economy principles. Universities, in particular, function as small-scale socio-technical systems that combine food service operations, green spaces, administrative structures, and user communities. This makes them especially suitable for experimenting with waste reduction, organic waste valorization, and sustainability-oriented behavioral change (Jacyna-Gołda et al., 2025).

The Circular Economy and Organic Waste Valorization

Circular economy frameworks aim to close resource loops, minimize waste, and regenerate natural systems. Within this paradigm, organic waste is reframed not as a disposal burden, but as a biological resource that can be reintroduced into local ecological cycles (Duman et al., 2025). Practices such as composting, anaerobic digestion, and Bokashi fermentation enable food residues to be converted into soil amendments, thereby reducing disposal pressures and supporting more regenerative forms of resource use.

Universities that adopt circular economy principles often combine operational measures with educational objectives. Organic waste separation, composting activities, campus gardens, and sustainability-oriented workshops can transform everyday waste flows into learning opportunities. In this way, campuses function not only as consumption sites, but also as living laboratories in which resource recovery practices can be tested, observed, and improved.

Bokashi's Fit for Campus Environments

Bokashi is particularly compatible with campus-based sustainability initiatives due to its compact design, odor control, and ability to process mixed food residues generated in institutional dining environments. Its small-scale and low-tech character makes it suitable for pilot applications in universities, where both operational feasibility and educational value can be assessed simultaneously In addition to reducing the volume of food waste sent to disposal, Bokashi-based activities can support experiential learning by allowing students and staff to engage directly with processes of waste segregation, fermentation, and soil regeneration. For this reason, Bokashi has growing relevance within campus sustainability programs that seek to combine circular resource management with environmental awareness and participatory learning. Although the number of documented university-based Bokashi applications remains limited, existing examples suggest that campuses provide a promising environment for testing decentralized composting practices in both operational and educational terms (Akgül, 2025; Tanoğlu, 2025; Duman, 2025).

Challenges in Institutional Adoption

Despite its apparent simplicity, the implementation of Bokashi in institutional settings is shaped by multiple interrelated technical, behavioral, and organizational conditions. A major challenge lies in limited user awareness and insufficient training, both of which can lead to inappropriate material handling and deviations from fermentation protocols. In institutional environments, inconsistencies in waste separation and variation in input quality may further reduce microbial stability and process reliability. In addition, weak monitoring routines and limited feedback mechanisms make it difficult to identify operational errors at an early stage. At the organizational level, the absence of

standardized procedures and long-term ownership can undermine continuity, especially in pilot-based sustainability initiatives.

These risks are particularly visible in campus-based applications, where a technically feasible process may still fail if participation is inconsistent, materials are not properly calibrated, and corrective action is not taken in time. For this reason, successful Bokashi implementation in institutions requires not only technical knowledge, but also procedural discipline, monitoring capacity, and institutional commitment.

Research Method

Research Design

This study employed a qualitative single-case study design to examine the implementation of the Bokashi method within an institutional campus setting. A case study approach was considered appropriate because the research focused on a real-life, context-dependent intervention shaped by technical, behavioral, and organizational variables. Rather than testing Bokashi under laboratory-controlled conditions, the study aimed to understand how the method functioned when applied in a collective-use educational environment. In this sense, the research was designed to identify implementation conditions, operational disruptions, and lessons for future institutional adaptation.

Study Setting and Pilot Context

The study was conducted at İstanbul Ticaret University during the spring term of 2024 within the context of a campus-based sustainability workshop. The Bokashi pilot was designed as a small-scale practical intervention focusing on the treatment of post-consumer cafeteria food waste through decentralized fermentation. The implementation took place in an institutional environment where participant interaction, procedural consistency, and material management directly affected the process. In addition to its operational objective, the workshop also served an educational purpose by promoting awareness of circular resource use and food waste valorization. The activity was implemented within a broader university sustainability initiative supported by a Jean Monnet framework.

Data Sources and Data Collection

Data were derived from direct observation during the workshop and follow-up period, implementation-related field notes, process documentation concerning material use and fermentation conditions, and reflective participant feedback collected during and after the pilot. The data collection process covered the preparation, implementation, and post-implementation reflection stages of the pilot. During these stages, particular attention was paid to layering practices, material balance, sealing consistency, odor formation, and leachate

development. Where available, observational records were supported by notes on the approximate quantities of food waste, Bokashi bran, and absorbent material used during the pilot. These materials were not used for statistical testing; rather, they were used to reconstruct the process and identify the main sources of implementation difficulty.

The research process unfolded in three stages. First, preparatory activities were conducted, including material preparation and workshop organization. Second, the implementation stage involved the layering of food waste, inoculated material, and absorbent inputs in sealed containers and the observation of fermentation-related indicators over a 15-day period. Third, an evaluation stage was conducted in which the observed outcomes were compared with standard Bokashi expectations and relevant literature.

Analytical Strategy

The qualitative material was analyzed through thematic coding in order to identify recurring implementation problems and interpret the factors that contributed to process failure. The coding structure was organized around three analytical dimensions: technical implementation conditions, behavioral compliance and participation, and institutional support mechanisms. This analytical framework allowed the study to move beyond a purely descriptive account and to examine how technical and non-technical variables interacted during the pilot. The analysis combined deductive and inductive reasoning: the three main dimensions were defined in advance, while specific operational disruptions and participant-related observations were identified through repeated reading of the field material.

Ethical Considerraations

The study was based on non-invasive observational documentation of a workshop conducted within an institutional sustainability activity. No sensitive personal data were collected, and no identifiable participant information is reported in the manuscript. Participant-related reflections were used only at an aggregate and non-identifiable level to support the interpretation of implementation dynamics. On the other hand, under the rules of project, participants were informed that the implementation process would be documented for research and educational evaluation purposes.

Case Study: Bokashi Pilot at İstanbul Ticaret University Cafeteria

A Bokashi pilot was conducted during the spring term of 2024 at İstanbul Ticaret University as part of a campus-based sustainability initiative. The activity was implemented within a broader university sustainability framework supported by a Jean Monnet initiative.

Project Design and Objectives

The project team—comprising faculty members, graduate students, and sustainability office staff—designed a pilot Bokashi implementation as part of a workshop series.

The project consisted of several sequential steps, including the collection of post-consumer food waste from the cafeteria, the preparation of Bokashi bran using wheat bran and effective microorganisms, the layering of organic waste with carbon-rich materials in airtight containers, and the monitoring of fermentation indicators over a 15-day period.

The goal was not only to test the method but also to raise awareness among participants and document the feasibility of on-campus decentralized composting. Process of the study is given in.

Table 1

Planned and Observed Bokashi Process During the 15-Day Campus Pilot

Day/Phase	Expected process	Observed process
Day 1–3	Layering and sealing	Inconsistent layering
Day 4–7	Early fermentation / mild acidic smell	Excessive dryness / no stable fermentation
Day 8–10	Leachate formation expected	Limited or stagnant leachate
Day 11–15	Progressive fermentation	Process instability / imbalance persisted

Observations and Outcomes

The pilot did not produce the intended fermentation outcome under the observed implementation conditions.

Observaations of the implementation process revealed several interrelated operational problems. First, sawdust was used in excessive amounts relative to the intended balance of the mixture, which appears to have weakened microbial activity and disrupted fermentation conditions. Second, layering practices were not fully consistent throughout the pilot, reducing process uniformity within the container. Third, moisture conditions were not systematically controlled, and no continuous measurement protocol was applied for variables such as temperature or pH. In addition, inconsistencies in sealing practices may have allowed partial air exposure during the process.

As a result of these combined conditions, the material did not progress through fermentation as expected, and leachate development remained limited.

Lessons Learned

Despite the unsuccessful fermentation outcome, the pilot generated several practical insights for future institutional applications.

The experiment generated several critical insights regarding the practical requirements of successful Bokashi implementation. Excessive reliance on

carbon-rich absorbents, such as sawdust, without adequate moisture calibration was found to inhibit anaerobic fermentation and weaken microbial performance. The findings also indicate that clear instructional materials and visual guidelines are essential for novice users to ensure procedural consistency. Moreover, effective Bokashi systems require a structured preparation phase, including material testing and participant training, rather than relying solely on on-site implementation. Finally, continuous monitoring of key indicators such as pH levels, temperature, and volume reduction was identified as a necessary condition for early detection of process deviations and timely corrective intervention.

These findings echo the concerns highlighted in previous studies and strengthen the case for institutional protocols and micro-training modules for Bokashi adopters. Although the intended technical result was not achieved, the pilot still enabled participants to observe the practical complexity of Bokashi implementation and to reflect on how small procedural deviations can affect the entire process.

Summary of Empirical Findings

The empirical findings of this study can be summarized under three main dimensions. First, technical failures primarily resulted from material imbalance, particularly excessive sawdust use and insufficient microbial inoculation. Second, behavioral factors such as inconsistent participation and limited training negatively affected process stability. Third, institutional limitations, including inadequate monitoring mechanisms and lack of standardized protocols, constrained successful implementation.

Taken together, these findings indicate that Bokashi implementation in campus settings depends on the interaction of technical accuracy, user discipline, and institutional coordination.

Discussion: Implementation Gaps, Learning Outcomes, and Scaling Potential.

The findings of the campus pilot provide insight into the practical challenges of implementing Bokashi as a low-tech circular economy practice in institutional settings. Although the environmental and operational advantages of Bokashi are frequently emphasized in the literature, the case presented here suggests that implementation outcomes depend not only on the method itself, but also on the way the process is organized, monitored, and collectively performed. In this respect, the pilot highlights the importance of understanding Bokashi not merely as a biological technique, but as a socio-technical practice shaped by materials, users, and institutional routines.

Implementation Gaps: What Went Wrong?

The pilot indicates that the unsuccessful fermentation outcome cannot be attributed to a single error. Rather, the process was affected by multiple interconnected implementation gaps. The first of these was material imbalance, particularly the excessive use of sawdust, which appears to have disrupted the intended fermentation environment. A second problem involved the lack of procedural standardization, including the absence of simple operational controls such as visual guidance, consistency checks, or routine monitoring practices. A third gap concerned participant-related variation, as the pilot relied on users with limited prior experience in Bokashi-specific procedures. Finally, the implementation environment itself lacked the degree of infrastructural and process support required to stabilize the intervention over time.

These issues parallel findings from both international (Duman et al., 2025; Miao et al., 2024) and national studies (Gürel, 2024), which emphasize the need for pre-implementation planning, resource adaptation, and capacity building in any Bokashi-based intervention.

When compared with existing studies, the findings of this research are largely consistent with previous evidence emphasizing the sensitivity of Bokashi systems to material ratios and user discipline (Pata et al., 2023). However, unlike laboratory-based experiments, this study demonstrates that institutional environments introduce additional behavioral and organizational variables that intensify implementation risks. Similar to Fruet-Cardozo et al. (2025), this research confirms that community engagement is a critical success factor, yet it further highlights that insufficient procedural standardization can override high motivation levels. The findings therefore suggest that high motivation or general environmental awareness alone is insufficient; without procedural standardization, even well-intentioned sustainability initiatives may fail to achieve their intended outcome.

From a broader implementation perspective, the case suggests that decentralized composting initiatives depend on three interacting conditions: users must know what to do, institutions must provide the conditions that make correct practice possible, and participants must remain engaged throughout the process. When one of these conditions weakens, technical feasibility alone is rarely sufficient for success.

Lessons Learned: Turning Failure into Pedagogy

Despite its shortcomings, the experiment fulfilled an essential pedagogical function.

By participating in the Bokashi process, students and staff members gained a more concrete understanding of how fermentation depends on the interaction

between moisture balance, microbial inputs, sealing conditions, and procedural consistency. The pilot also strengthened systems-oriented thinking by making visible the links between food consumption, waste generation, biological treatment, and soil regeneration. In addition, the post-implementation reflections encouraged participants to discuss not only what had failed, but why the failure occurred and how future applications could be redesigned more effectively.

This shift from "hands-on" to "minds-on" learning is valuable in education for sustainability, aligning with literature that supports experiential failure as a mode of deep learning.

Scaling Potential: Is Bokashi Viable Beyond the Pilot?

When supported by appropriate technical and organizational conditions, Bokashi appears to have considerable potential as a decentralized sustainability practice in urban and institutional settings. Its limited space requirements, low energy dependence, and compatibility with mixed food residues make it particularly attractive for campuses, residential environments, and small-scale collective-use facilities. In this regard, Bokashi may serve not only as a waste treatment option, but also as a visible and participatory sustainability instrument.

At the same time, the present case confirms that Bokashi should not be treated as a plug-and-play solution. Scaling requires context-sensitive implementation tools, user-oriented training, routine monitoring mechanisms, and reliable access to appropriate microbial and absorbent materials. Moreover, long-term adoption depends on whether institutions are able to integrate the practice into everyday operational structures rather than treating it as a one-time workshop activity. Accordingly, the scalability of Bokashi depends not only on technical simplicity, but on the strength of the socio-technical infrastructure that sustains participation, coordination, and adaptive learning.

Conclusion and Policy Recommendations

This study examined the possibilities and limitations of implementing the Bokashi method for food waste management within a university campus setting through a qualitative case-based analysis. While the fermentation process did not reach completion due to material imbalance and procedural missteps, the experience generated valuable practical and educational insights into circular food systems, decentralized composting, and behavioral patterns in sustainability initiatives.

The findings suggest that Bokashi can be a meaningful tool for institutional food waste management when technical conditions, user practices, and organizational support are aligned. More broadly, the study contributes to the sustainability and waste management literature by showing that decentralized composting systems

should be evaluated not only in technical terms, but also in relation to behavioral compliance and institutional coordination. In this respect, the case demonstrates that implementation failures, when systematically documented, can provide valuable evidence for redesigning future practice.

This study contributes to sustainability and waste management literature by demonstrating that decentralized composting systems such as Bokashi require not only technical adequacy but also institutional coordination and behavioral alignment. The findings reveal that implementation failures can generate valuable learning outcomes when systematically documented and analyzed.

Several practical implications emerge from the study. For academic institutions, successful Bokashi implementation requires structured training, simple visual protocols, and routine monitoring tools to ensure procedural consistency. For public authorities, small-scale composting practices should be more clearly integrated into local waste management strategies and supported through guidance on quality standards and safe implementation. For the private sector, there is scope to develop affordable and user-friendly Bokashi kits, starter materials, and support tools tailored to institutional users.

These recommendations point to the need for a broader implementation perspective in which technical design is accompanied by educational support, process standardization, and institutional ownership. In other words, the long-term viability of Bokashi in campus environments depends not only on the method itself, but on the organizational conditions under which it is introduced and maintained.

The study has several limitations. First, it is based on a single institutional case and therefore does not allow broad generalization. Second, the analysis relies primarily on qualitative process documentation rather than on controlled experimental measurements. Third, the short duration of the pilot limits the ability to assess longer-term fermentation performance and post-application soil effects.

Future research may build on this study by comparing Bokashi applications across multiple campuses, extending the observation period, and incorporating more systematic technical indicators such as temperature, moisture, pH, and material ratio tracking. Comparative studies may also help clarify how organizational culture, participant training, and institutional support affect implementation outcomes in different settings.

Contribution Rate Statement

Each researcher have equal percentage contribution to this study.

Acknowledgement

This study was written as an outcome of a workshop within the scope of the Jean Monnet Chair project being carried out at Istanbul Ticaret University. In this context, the aforementioned campus cafeteria project was funded by the European Union.

Conflict of Interest

There is no conflict of interest in the research.

AI Use Disclaimer Statement

Gemini and QuillBox application are used for language editing.

KAYNAKÇA

Akgül, Ü. (2025). *Evaluation of circular economy in relation to bread waste: AHP analysis in Istanbul*, [Master Thesis, İstanbul Ticaret University]. YÖK Tez Merkezi. https://tez.yok.gov.tr/UlusalTezMerkezi/

Destek, M. A., Oguz, I. H., & Okumus, N. (2023). *Do trade and financial cooperation improve environmentally sustainable development?* A distinction between de facto and de jure globalization. MPRA Paper No. 117735, https://mpra.ub.uni-muenchen.de/117735

Duman, H., H., Öz, S., & Köksal, C. (2025). A bibliometric analysis of the relationship between the green deal and foreign trade terformance. *Journal of International Trade, Logistics and Law*, *11*(2), 377-385.

Duman, H. H. (2025). *The effects of protectionist policies implemented within the scope of the green deal on export performance: A Türkiye analysis*, [PhD Thesis, Istanbul Ticaret University], YÖK Tez Merkezi. https://tez.yok.gov.tr/UlusalTezMerkezi/

Evcim, Ş. H., & Gümüş, İ. (2022). The Significance of bokashi compost obtained from beneficial microorganisms on sustainability and waste disposal. *Selcuk Journal of Agriculture and Food Sciences, 36*(4), 95-99. https://izlik.org/JA64CT43KH

Fruet-Cardozo, V., Valverde-Roda, J., López del Río, L. C., & Brito-Guerrero, R. (2025). Sustainable development and foreign trade: Evaluating macro-economic indicators in the MENA region. In A. D'Auria & J. Sanchez-Rivas Garcia (Eds.), *İn Strategies for Sustainable Territorial Development* (pp. 69-88). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-7081-0.ch004

Gürel, S. (2024). Gıda atığı kompostu ile kimyasal gübre uygulamasının marul ve ıspanak yetiştirilen vertisol grubu toprakların verimliliğine etkileri. *Türk Tarım ve Doğa Bilimleri Dergisi 11*(2): 396–408. https://doi.org/10.30910/turkjans.1433803

Jacyna-Gołda, I., Shmygol,N., Sembiyeva, L., Cherniavska, O., Burtebayeva, A., Uskenbayeva, A., & Salwin, M. (2025). Modeling sustainable development of transport logistics under climate change, ecosystem dynamics, and digitalization. *Applied Sciences, 15*(7593). https://doi.org/10.3390/app15137593

Manisa, K., Koltukoğlu, B., Koçulu, A. & Topçu, M.S. (2025). Model proposal for a portable rooftop greenhouse: Improving middle school students' environmental consciousness and attitudes. *New Design Ideas, 9*(1), 195-226. https://doi.org/10.62476/ndi.91.195

Miao, X., Yao, T., Dong, C. et al. (2024). Global, regional, and national burden of non-communicable diseases attributable to occupational asbestos exposure 1990–2019 and

prediction to 2035: worsening or improving? *BMC Public Health 24*, 832. https://doi.org/10.1186/s12889-024-18099-4

Öztürk, S. (2025, 19-20 June). Bokashi technique and its applications, [Summer School Presentation] JM chair EU's circular economy policies and sustainability, İstanbul, Türkiye.

Pata, U. K., Olasehinde-Williams, G., & Ozkan, O. (2023). Carbon efficiency in China: Should we be concerned about the shadow economy and urbanization?. *Geological Journal, 58*(10), 3646-3658. https://doi.org/10.1002/gj.4777

Tanoğlu, E. (2025). *Digital Health Technologies Applications from the Circular and Green Economy Perspectives.* [PhD Thesis, Istanbul Ticaret University], YÖK Tez Merkezi. https://tez.yok.gov.tr/UlusalTezMerkezi/

Valeria, C., & Mazzanti, M. (2012). On the green and innovative side of trade competitiveness? The impact of environmental policies and innovation on EU exports. *Research Policy, 41*(1), 132-153. https://doi.org/10.1016/j.respol.2011.08.004

Wang, L., Vo, X. V., Shahbaz, M., & Ak, A. (2020). Globalization and carbon emissions: is there any role of agriculture value-added, financial development, and natural resource rent in the aftermath of COP21? *Journal of Environmental Management*, 268, 110712. https://doi.org/10.1016/j.jenvman.2020.110712

Yoleri, S. (2012). Çocuk ve çevre: Okul öncesi çocuklar arasında çevre bilinci oluşturma. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi*, *34*, 100-111. https://izlik.org/JA88WM79PJ