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Collaborating for Social Impact: Enhancing Food Security Through Participatory Action Research

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ABSTRACT

Background: The food security for better health (FSBH) project is a collaboration between Mangosuthu University of Technology (MUT) and primary schools in Umlazi township, KwaZulu-Natal, South Africa, aimed at combating food insecurity and malnutrition. Although South Africa is largely food secure, many households still experience hunger.

Methods: Using a community-based participatory research (CBPR) approach, MUT's community extension department partnered with internal and external stakeholders to establish vegetable gardens in five primary schools. Schools provided land, water and security, while MUT offered expertise. Twenty learners per school participated, with ongoing progress monitoring. Data collection involved observations, interviews and record analysis. Thematic analysis highlighted the project's success, driven by proactive engagement from MUT staff and strong participation from schools.

Result: The project supported school feeding programmes by producing and utilising vegetables while sparking interest in similar initiatives. The success of FSBH shows the value of stakeholder collaboration, education and capacity building in addressing food insecurity and promoting sustainable local food systems.

Key words: Collaborative community engagement, Experiential learning, Food security, Malnutrition, Sustainable agriculture.

INTRODUCTION

The intersection of food security, nutrition and sustainable agriculture is crucial to achieving global development objectives, including the Sustainable Development Goals (SDGs). Despite ongoing efforts, undernourishment is projected to rise globally (Food and Agriculture Organization [FAO], International Fund for Agricultural Development [IFAD], United Nations Children's Fund [UNICEF], World Food Programme [WFP] and World Health Organization [WHO], 2020). SDG 2 emphasises the urgency of ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture (FAO, IFAD and WFP, 2016). Addressing these challenges requires integrated approaches that link these key areas (Mollier *et al.*, 2017). Considering growing population pressures and increasing food demand, Pampori and Sheikh (2023) emphasised the urgent need for sustainable and efficient food production systems. Addressing these challenges requires a comprehensive understanding of food security, which, as Ighodaro *et al.* (2021) outlined, encompasses four key dimensions: availability, referring to an adequate supply of food; access, relating to individuals' ability to obtain food; stability, which involves the consistent and sustainable provision of food; and utilisation, concerning the nutritional quality and safe consumption of food.

In South Africa, townships like Umlazi face persistent public health crises due to poor nutrition, highlighting the need for interdisciplinary action (Tuomala and Grant, 2022). Cost-related barriers to healthier diets necessitate interventions that improve access to nutritious food in marginalised communities (Drimie *et al.*, 2013). Triyono *et al.* (2025) argued that ensuring food security requires focused attention on food production, its quality and the surrounding environmental conditions. The prevalence of food insecurity calls for collaborative governance and community-led initiatives to tackle hunger and malnutrition at their roots (Mkhize *et al.*, 2023).

This paper examines the partnership between Mangosuthu University of Technology (MUT) and schools in Umlazi Township, Durban, to enhance food security and

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nutrition through vegetable gardening. Integrating sustainable agriculture and nutrition education into school activities can help address food insecurity and malnutrition. School gardening programmes not only supplement meals but also improve academic performance, encourage healthy eating and promote environmental sustainability (Araya *et al.*, 2020; Berezowitz *et al*., 2015).

Background of the project

The Food Security for Better Health (FSBH) Project began in 2018 after discussions with a primary school in Umlazi Township, where the principal highlighted the need for a vegetable garden to support the school's feeding scheme. Officially launched as a Mangosuthu University of Technology (MUT) initiative in 2022, the project expanded to include Bavumile, Inkonkoni, Zimisele and Ngqayizivele primary schools, as well as Masibambane Day Care Centre. These schools were selected based on their willingness to participate following a consultative meeting.

A collaboration between MUT's Community Extension Department, the Community Engagement and Development (CEAD) Directorate, school principals, educators and learners, the project aims to enhance food security, deepen agricultural and nutritional knowledge and improve school feeding schemes. The initiative promotes experiential learning while increasing the quality and quantity of produce available for student nutrition.

Registered with MUT's CEAD Directorate in 2022, the project continues to expand in response to the demand for school vegetable gardens in Umlazi. Key activities include stakeholder engagement, resource procurement, land preparation, planting, weed and pest control, irrigation and bi-monthly monitoring and evaluation.

Purpose of this paper

This paper evaluates the FSBH Project as a model of university-community collaboration addressing food insecurity and malnutrition. It examines how the project aligns with principles of effective community engagement, emphasises the role of stakeholder commitment in its success and assesses its impact as an ongoing partnership between the university and the community.

MATERIALS AND METHODS

This study utilised a qualitative research design to evaluate the FSBH project. Data were collected through interviews, participant observations and archival records, using both primary and secondary sources. Primary data were obtained from interviews and observations, while secondary data came from archived documents. Participant observation, a key component of community-based participatory research (CBPR) and participatory action research (PAR), was integral to the study (MacDonald, 2012).

Participants included principals, educators and learners from Zimisele Primary School, Bavumile Primary School, Inkonkoni Primary School, Ngqayizivele Primary School and Masibambane Day Care Centre. Initially, 20 to 25 learners per school took part, except at Masibambane Day Care, where learners faced mental or physical challenges. However, during the interviews, some participants were unavailable. Interviews aimed to capture experiences and assess the project's impact. Encouraging open discussions allowed for a more in-depth understanding than surveys. With participants' consent, interviews were audio-recorded to ensure accurate documentation and analysis.

The interview schedule included sessions with principals, educators and learners across the five schools, with a total of 67 participants. Data were transcribed and verified before thematic analysis, following Braun and Clarke's, (2006) approach. This method, recognised for its ability to capture theoretical and epistemological insights (Kiger and Varpio, 2020), facilitated the identification of key patterns and themes (Naeem *et al.*, 2023). Table 1 presents the coding system used in the study.

RESULTS AND DISCUSSION

Characteristics of study participants

Sixty-seven participants were interviewed, including 61 learners (Grades 4-7) and six adults: Three principals, two teachers and one gardener from Masibambane day care centre. The adults, evenly split by gender, averaged 45 years old. Four had tertiary education, while two completed Grades 11-12. Their practical and academic experience provided important perspectives for the study. As the learners were children, data collection did not focus on their personal characteristics.

Alignment of the FSBH project with community collaboration principles

This study assessed how the FSBH project aligns with principles of effective community collaboration. University-community partnerships, such as MUT's engagement with Umlazi schools, are crucial for advancing education and

Table 1: Participant's identifiers.

Participating schools	Principal	Educator/gardener	Learners
Zimisele primary school	Z1	Z2	ZL
Bavumile primary school	B1	B2	BL
Inkonkoni primary school	I1	I2	IL
Ngqayizivele primary school	N1	N2	NL
Masibambane day care centre	M1	M2	ML

community development (Jackson and Marques, 2019). The FSBH project enhances food security through school-based vegetable gardening, integrating institutional support with local participation. Its alignment is examined through four key aspects: Adherence to CBPR principles, CEAD Directorate's framework, willingness of participants and stakeholder perspectives.

Alignment of the FSBH project with CBPR principles

The FSBH project aligns closely with the principles of CBPR by promoting collaboration between MUT and Umlazi schools to address food security and malnutrition in the community. CBPR prioritises active partnerships, knowledge co-creation and empowering marginalised communities to develop their own solutions (Ford *et al.*, 2012; Wood and McAteer, 2017). MUT lecturers and local schools collaborate with government departments such as Agriculture and Environmental Affairs, which provide seeds and seedlings. The project integrates sustainable agriculture and nutrition education into outdoor activities, equipping learners and educators with essential skills. Community extension students contribute by sharing practical knowledge, reinforcing experiential learning and capacity building. This hands-on, participatory approach ensures meaningful community engagement in addressing local challenges (Goins *et al.*, 2011; Huffman, 2017).

Emphasis on willingness in the FSBH project

The FSBH project prioritised schools that voluntarily participated, aligning with CBPR principles of collaboration, shared goals and mutual benefit. MUT provided expertise, tools and transport, while schools contributed land, water and garden management. Twenty learners per school, selected from Grades 3 to 6, cultivated vegetables such as cabbage, spinach, beetroot, onions, kale, green pepper, brinjal, tomatoes, lettuce and green chillies, under an educator's supervision. MUT and CEAD officials conducted regular monitoring. This approach underscores the project's commitment to community involvement, sustainability and education, reinforcing CBPR's focus on meaningful, community-led outcomes.

Participants' perspectives on the FSBH project

MUT staff engaged schools early, identifying gardening sites and assessing interest. Participant B2 recalled:

"MUT staff visited our school to show us how to grow fresh produce. They asked where we could garden and after we showed them, they promised to return to prepare the land. They explained the project and we were happy to participate."

This reflects MUT's commitment to collaboration, aligning with PAR principles of mutual agreement (Hawkins, 2015). Burns and Worsley (2015) emphasised that involving participants ensures relevance and ownership. Participant N1 confirmed: "We were consulted and invited to a meeting where project goals were shared," while Participant Z1 added: "We were invited to Mangosuthu University for a briefing before the project started."

MUT staff provided land preparation, training and ongoing support. Participant N1 stated: "MUT showed us how to do everything and assisted every time they came," and Participant I2 noted: "If I have questions, I contact them." This aligns with the view that universities can significantly support community projects (Bhagwan, 2018).

At Masibambane Day Care Centre, Participants M1 and M2 highly rated MUT's involvement. The project also fostered collaboration, as Participant B2 shared: "We visited other schools to see their progress and encourage each other." Educators were dedicated, with Participant N1 highlighting a volunteer educator's passion for agriculture and Participant I2 noting shared responsibilities. Overall, the FSBH project strengthened food security and university-school partnerships through effective collaboration.

Commitment as a key factor in collaborative initiatives

Commitment and active participation are essential for achieving project goals. Cen *et al.* (2021) defined commitment as a willingness to act for oneself or others. The experience at Bavumile Primary School highlights that success depends on the dedication of school staff, learners and external partners. Participant B2 noted the collective effort of MUT staff, the principal, teachers and learners: "We were happy to participate." This enthusiasm led to active learner engagement, as Participant B2 observed: "The learners watered the garden themselves and enjoyed it." However, challenges such as theft emphasised the need for external support and security. Participant B2 expressed frustration: "The only issue was with the community. They stole all the crops." This highlights that internal commitment must be complemented by external support and security measures for sustainability.

Bonow and Normark (2018) found that successful garden projects rely on participant commitment, with larger groups often struggling due to lower commitment levels. Therefore, dedicated participation is key to the long-term viability of garden projects. Participant N1 stressed the importance of school and MUT collaboration: "I love the project. Sometimes I was hands-on with the learners, assisting them with irrigation and other tasks." Teachers also showed dedication, volunteering due to their passion for agriculture. Project coordinator Participant I2 played a key role in garden management: "My deputy principal appointed me to lead this project. I was happy to take on this role." Strong school-MUT collaboration reinforced project success, with Participant I2 rating MUT staff a "10." While learner participation was significant, consistency was a challenge, as Participant I2 noted: "I give them a 9, because some could not always be on time."

Participant Z1's personal commitment exemplifies the role of individual dedication: "I decided to run with it myself, as I also like agriculture." High MUT staff involvement, rated "10 out of 10," further underscores the importance of external support. Bonow and Normark (2018) found that bottom-up initiatives thrive when participants take ownership.

The experience at these schools reinforces that long-term success depends on both internal dedication and external collaboration, ensuring sustainability despite challenges.

Impact of the FSBH project as a university-community collaboration

This paper's third objective is to assess the FSBH project's achievements as a university-community collaboration, focusing on improving school nutrition and promoting a food gardening culture among learners.

Contribution to school feeding schemes

The study found that the FSBH project successfully enhanced vegetable production and utilisation. At Bavumile Primary School, despite theft challenges, the garden provided fresh produce for meals and generated income. Participant B2 noted, "We used some vegetables for learners' meals and sold some to teachers". Similarly, Ngqayizivele Primary School benefited significantly. Participant N1 stated, "We use green peppers from our garden since the department does not supply them". Participant M1 added, "Whenever I need green peppers for cooking, I go to the garden". This integration improved meal quality. In South Africa, where the National School Nutrition Programme (NSNP) serves over 9 million learners, yet fewer than half of schools have gardens (Devereux *et al.*, 2018), initiatives like FSBH address this gap.

School-based vegetable gardens supplement nutrition programmes, combat hidden hunger and promote dietary diversity (Araya *et al.*, 2020). Participant I2 reported multiple harvests: "We've had about three to four harvests." Participant M1 added, "We harvest regularly, using or selling the produce. With the money, we buy bread and other essentials." Participant M2 noted, "The project not only benefits the school but also equips us with skills to share with our communities. Instead of buying food, we use our garden's produce." Participant Z2 highlighted that chilies and spinach were given to children, directly benefiting their nutrition. According to Food and Trees for Africa (FTFA, 2024), school gardens improve learners' nutrition, health, concentration and academic performance. The FSBH project is an effective tool for enhancing school meal quality and promoting healthier eating habits.

The FSBH project: Empowering young learners

The FSBH Project has successfully equipped learners with gardening skills and fostered a gardening culture in schools. Participant B2 noted, "Learners have shown interest and learned they can have their own gardens at



(a) (b)

Fig 1: Planting of seedlings at inkonkoni primary school/watering of plants.



Fig 2: An educator harvesting fresh vegetables at inkonkoni primary school.

home," demonstrating its impact beyond school. At Inkonkoni Primary School, learners were actively involved in both the planting of seedlings and watering of plants (Fig 1). Participant I2 observed particular enthusiasm among girls, who not only enhanced their gardening knowledge but were also inspired by female educators serving as role models. These educators actively participated in the project, reinforcing learners' confidence and motivation, with one pictured harvesting fresh vegetables at Inkonkoni Primary School (Fig 2).

At Masibambane, the project's success was evident in the cabbages cultivated in the garden and the harvested crops (Fig 3 and 4). Participants BL described these hands-on experiences in planting and harvesting, while Participants NL reported starting home gardens. Participant Z1 stated, *"The project makes learners develop a love for agriculture,"* reinforcing its effectiveness. Gardening is increasingly recognised as a valuable health promotion tool for children and adolescents (van Lier *et al.,* 2017).



Fig 3: Cabbages grown at masibambane.



Fig 4: Harvested crops at masibambane

Critical lessons from the project

The collaboration between MUT and primary schools in Umlazi offers key lessons for tackling food insecurity and malnutrition through community engagement:

Stakeholder engagement and collaboration

Inclusive planning

Involving diverse stakeholders, including university departments, local schools, government entities and the community, ensures a comprehensive understanding of needs and resources, promoting ownership.

Shared goals

Establishing common objectives aligns efforts and resources. In this project, the shared goal of tackling food insecurity created unity.

Resource pooling

Combining expertise and resources, such as MUT's technical support and schools' land, water and manpower, enhanced the project's capacity and addressed resource constraints.

Collaborative efforts between MUT and Umlazi schools demonstrate how combining academic expertise with community resources effectively addresses local challenges. Clear roles and responsibilities ensured smooth operation, showcasing the FSBH Project as a model of university-community collaboration and effective teamwork.

Selection and commitment of participating entities

Willingness to participate

Selecting schools ready to engage ensures higher commitment and active participation, crucial for success. This reflects CBPR's focus on mutual benefit and collaboration, alongside MUT CEAD Directorate's policy of 'reciprocity and equality'.

Terms and engagement

Clear engagement terms manage expectations and responsibilities. The agreement between MUT and the schools established a strong project foundation.

Schools with dedicated educators and committed learners showed better results, emphasising the importance of active participation. Variations in commitment levels across schools highlighted the need for consistent support to achieve success. The FSBH project demonstrates that the collective commitment of all parties is critical for the success of collaborative initiatives.

Sustainability and community involvement

Active Participation

Involving learners and teachers in garden management during the project team's absence fosters responsibility

and ownership, crucial for sustainability.

Capacity Building

Training learners, teachers and community members in agricultural practices strengthens local capacity, ensuring long-term benefits. Educating and empowering participants with agricultural skills has been vital for the project's continued success.

Monitoring and evaluation

Continuous observation

Regular monitoring by the project team and CEAD officials ensures the project stays on track, addressing issues promptly. Documenting growth and assessing learner understanding through observations and photos aids in evaluating impact.

Baseline data

Collecting initial data from learners enables the measurement of progress and outcomes, which is essential for assessing effectiveness and making adjustments.

Education and awareness

Agriculture and nutrition education

Involving learners in gardening activities enhances their understanding of food production and healthy eating.

Community education

Raising awareness in the broader community about the FSBH project promotes support, encouraging a movement towards better food security and health.

Implications for agricultural extension/community engagement

Enhanced stakeholder collaboration

The FSBH project highlights the value of partnerships among universities, communities and key stakeholders. Extension services can harness such collaborations to pool resources, share expertise and address community issues more effectively.

Focus on education and capacity building

Integrating agricultural education into school activities raises awareness from a young age. Extension services can develop programmes in partnership with educational institutions to teach practical skills and promote farming careers. Providing training to community members, especially educators and learners, builds local capacity and empowers individuals to sustain agricultural projects.

Promoting food security and nutrition

Extension services can connect agricultural practices with nutritional outcomes, ensuring food security efforts also address malnutrition. Strengthening local food systems through community-based projects enhances resilience to food insecurity, particularly in vulnerable communities.

Documentation and knowledge sharing

Documenting and sharing success stories from projects like FSBH can guide similar efforts. Extension services can create platforms for knowledge sharing and replicating successful models.

CONCLUSION

The FSBH project has successfully demonstrated the impact of collaboration between MUT and Umlazi schools.

The project has enhanced food security and self-sufficiency through vegetable gardening, combining institutional support with local engagement. It demonstrates the potential of university-community partnerships in achieving educational and community goals.

The project's success lies in its collaborative nature, with active participation from MUT staff and schools providing a strong foundation. This partnership has facilitated the transfer of gardening skills to learners, extending practical knowledge beyond the classroom. Tangible outcomes include the production and use of vegetables in school feeding programmes, highlighting the project's effectiveness. Commitment from all parties, including school staff, learners and MUT representatives, has been key in overcoming challenges such as theft and logistical issues. The support from internal and external stakeholders has been crucial in sustaining the project's success.

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Disclaimers

The views and conclusions expressed in this article are solely those of the authors and do not necessarily represent the views of their affiliated institutions. The authors are responsible for the accuracy and completeness of the information provided, but do not accept any liability for any direct or indirect losses resulting from the use of this content.

Informed consent

All data were obtained from human participants, following approved protocols. Ethical clearance was granted by the MUT Research Ethics Committee (REF: RDI/10/2024).

Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this article. No funding or

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