

Performance Assessment of Public Funded School Food Gardens Projects in the Sedibeng District Municipality

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Abstract: Performance assessment forms part of the performance management function in organisations. This research study was aimed at assessing the performance of public funded school food garden projects to determine their relevance and fulfilment towards poverty alleviation in Sedibeng District Municipality (SDM). The school food garden projects are led by the Gauteng Department of Agriculture and Rural Development (GDARD). The GDARD is responsible for agricultural affairs, environmental protection and nature conservation within Gauteng. The department has also established various projects in Gauteng. This study is prompted by the poor performance of some public funded community projects aimed to alleviate poverty and the creation of income earning opportunities. Some established projects are discontinued due to lack of participation. This study assesses the performance of school gardens projects in the selected schools. It also analyses the impact of these projects towards improving the lives of the community and enhancing food security. A qualitative research approach was used where a set of questionnaires containing open ended questions were designed and issued to the six selected schools in the SMD respectively to collect data. Literature review was considered to understand the concepts and a content of the study. The results show that there are different forms of performance measurement and assessments that can be used to assess school food gardens. The researchers found that performance assessment is vital to determine the relevance and fulfilment of objectives. We recommend a development of performance measurement systems and indicators for school gardens and integrating food gardens into the curriculum.

Keywords: Food security, Performance, Performance assessment, Programmes, Public funded, School gardens

1. Introduction

This research is located within the context of project performance management. The research focuses on the performance of public funded community food security projects. The research is a project performance assessment of the school garden projects established in Sedibeng District Municipality (SDM). The school food garden projects are led by the Gauteng Department of Agriculture and Rural Development (GDARD). The GDARD is responsible for agricultural affairs, environmental protection and nature conservation within Gauteng. The department has also established various projects in Gauteng. The study assesses the performance of public funded school garden projects to determine their relevance and fulfilment of project objectives in the SDM. This study is prompted by the poor performance of public funded community food security projects to fulfil project objectives, such as to alleviate poverty and create income earning opportunities (Mtshisazwe, 2018). Performance assessment of these projects is vital in promoting food security (Food and Agriculture Organisation (FAO), 2013).

Project funders tend to pose two key questions. Firstly, they might seek to ascertain whether their assets are performing. Secondly, sponsors might also need to find out whether there is value for money on the invested projects (World Bank, 2016). Hence, one of the aims of structured finance is to mitigate risk and improve liquidity (World Bank, 2016). All donor funded projects should be able to meet envisaged objectives, improve food security and increase income earning opportunities among beneficiaries (Mtshisazwe, 2018).

2. Background: Sedibeng District Municipality

The Executive Mayor for SDM Busisiwe Modisakeng, on 04 May 2016, addressed the masses on the plan the municipality has in improving lives in the area. According to the mayor, in 25 years, the population of the province will increase by double to 25 million people. The issue of food security will be a critical factor in the wellbeing of a growing society. How is this going to be achieved? She alluded to the fact that the answer lies in the vast open spaces

of Sedibeng and especially in Lesedi and Midvaal local municipality and parts of Emfuleni. She further alluded to the fact that SDM has a potential in all kinds of agriculture that includes livestock farming to small gardens for sustenance (Sedibeng District Municipality, 2018). The mayor alluded to the fact that SDM is confronted by poverty and high unemployment levels that cannot be addressed overnight. She further stated that SDM shall double their efforts to ensure that established agriculture associates join them to strengthen their potential to halve poverty and unemployment. She concluded that agriculture sector is the best hope for economic survival and for future progress for SDM community (Sedibeng District Municipality, 2018).

3. Literature Review

School gardens are less documented in Southern Africa and at times must face the challenge of not being institutionalised in official school curricula. Several studies were undertaken to assess the performance of school gardens. A study by Demarco, Relf & McDaniel (1999:1) examined the factors essential for school garden success as perceived by teachers and found that student ownership and integration with other subjects were most often chosen by the survey participants. The study undertaken by Diaz, Warner & Webb (2018:143) utilized the Delphi approach with a panel of 74 experts to identify consensus on 38 outcomes that should be used to inform program development and evaluation efforts. A pilot study of a school gardening project involving a mixed method quasi-experimental design was undertaken in Oman with several Grade 7 classes (Ambusaidi, Al-Yahyai, Taylor & Taylor, 2018). The quantitative findings of this study indicated that employing school gardens as an educational resource might improve learning outcomes in the area of science skill development (Ambusaidi et al., 2018).

Lyons & Dlamini (2013:3) and Malberg Dyg & Wistoft (2018:11) identified following seven indicators applied for assessing school food security projects in South Africa.

- Number of students who benefit from the garden disaggregated by type of benefit (instruction, school feeding, take vegetables home).
- Number of hours of instruction time per week, disaggregated by subject.

- Quantity of production disaggregated by crop.
- Number of households who ate or sold produce from school gardens, disaggregated by level of vulnerability.
- Cropping intensity.
- Income generated from the garden sales.
- Percentage of beneficiary households who practice garden skills for a second year with little or no direct support (Lyons & Dlamini, 2013:3; Malberg Dyg & Wistoft, 2018).

The respective indicators are used to discuss the performance of school gardens.

4. Theoretical Context: Project Performance Assessment and School Garden

Project performance assessment is defined as a systematic and objective assessment of an on-going or completed project (Heyse, Zwitter, Witter & Herman, 2014). On-going assessments are undertaken to determine the relevance and fulfilment of project objectives, impact and sustainability. Project performance assessment provides information that is useful in order to incorporate new lessons learned into decisions and optimise performance. Project performance assessment promotes accountability and transparency for implementing departments (NDA, 2013). However, assessing performance of community food security projects remains a challenge in most institutions in South Africa (Mtshisazwe, 2018). The challenges associated with the performance of community food security projects cannot be ignored.

4.1 School Food Gardens

Food security projects are projects initiated by the government in order to help alleviate poverty (Nesengani, Mudau & Netshandama, 2016). A food garden is a garden that produces vegetables and fruits which are used for human consumption, and they are also referred to as kitchen gardens (Earl, 2011). Food gardens comprise of community food garden, household food garden and school food garden and are explained below. A school food garden is defined as "any garden where children are taught to grow vegetables while teaching the life

history of the plants" (Food Secured Schools Africa (FSSA), 2018). Malberg Dyg and Wistoft (2018:9) add that school food garden is "an innovative teaching tool and strategy that lets educators incorporate hands on activities in a diversity of interdisciplinary standards-based lessons".

5. Methodological Approach

The research examined the performance of public funded school gardens in Sedibeng District Municipality. A qualitative study was undertaken to gather data. A qualitative study was utilised to ensure the researcher gathers all relevant data for the success of this study. The samples were sourced from the three local municipalities within the SDM namely: Emfuleni, Lesedi and Midvaal. A total of twelve participants were interviewed, six school principals and six school garden managers, comprising of six school gardens that were observed. The six school principals and garden managers were interviewed and provided useable, reliable and verifiable information regarding the school garden. They gave information regarding the performance of school gardens and the elements crucial in sustaining these projects. Through their responses, the interviewer assessed the performance of school gardens in SDM. The six school gardens were observed, two from each local municipality in SDM. These school gardens were observed to authorise the observations which would assist in checking the reliability of the information provided by school principal and garden managers.

A questionnaire was used to collect data. In-depth interviews were conducted with the school principal and the garden managers in 2019. All the interviews were conducted face to face during 2019. Coding of names was done to adhere to the ethical considerations that were established to be relevant to this study. The responses were coded in the form of

numbers. These interviews assisted the researcher to establish and clarify the objectives of the research in terms of assessing the performance of the school gardens. The data gathered from the interviews allowed the researcher to obtain information on the performance of school gardens. The responses of the interviews enabled the researcher to ask in-depth questions and obtain relevant and thorough information relevant to this study. A total of six school principals and six school garden managers were interviewed and they were referred to as school interviewees (2-7).

6. Results

The results are presented in the section that follows.

6.1 Number of Learners Enrolled in a School

The school principals were required to provide the number of learners in the respective schools. The participating schools' learner enrolment is presented in the section that follows.

The participating schools enrolled both male and female learners who come from low-income households that are more likely to have food insecure learners. The results in Table 1 show that schools enrolled an almost equal number of male and female students. These schools were identified as being susceptible to hunger or being food insecure by the Department of Basic Education.

6.2 Learners Participating in the Garden

Participants were asked to provide the number of learners who were participating in the gardens. The results in Table 1 shows that only two schools [Interviewee 2 (69%) and interviewee 5 (67%)] had learners participating in school gardens.

Table 1: Number of Learners in School

Value	Female	Male	Learner's Participating in the Garden
Interviewee 2 (991 learners)	483	506	690 (69%)
Interviewee 3 (553 learners)	295	258	0 (0%)
Interviewee 4 (1817 learners)	925	892	0 (0%)
Interviewee 5 (912 learners)	466	446	618 (67%)
Interviewee 6 (1311 learners)	663	648	0 (0%)
Interviewee 7 (509 learners)	258	251	0 (0%)

Source: Authors

Interviewee 7 indicated that grade 7 learners from the school had participated in the school garden project only discontinuing after EPWP officials had taken to assisting the school with the project. Based on the responses, it is evident that schools would prefer having workers in the projects rather than having learners participating.

6.3 Number of Hours per Week Working in the Garden

A follow up question required participants to provide information about the extent of the learner's participation. Participants were asked about the number of hours utilised per week working in the garden. Only two responses were received for the posed question in line with the number of schools where there were learners participating in school garden projects. The responses from the two schools participating in the garden projects show that only an hour was utilised per week to engage in garden work as part of life orientation and natural science subject work. Based on the responses it is evident that some schools consider the garden projects as peripheral to their curriculum.

6.4 Existence of Feeding Scheme Programme in Schools

The participants were asked to specify if there were feeding programmes in the schools. A follow-up question required the school to indicate if the harvested crops are used in the feeding programmes. The school garden projects are supposed to supplement the feeding programme with vegetables and fruits. All six schools (Interviewee 2-7) reported that there is a school feeding programme in their respective schools. The participants further indicated that the crops harvested are used when the food is cooked in the respective schools. However, participants indicated that the supply from the school food gardens was unreliable although the food they served helped learners to be food secure. The crops harvested in school gardens are incorporated to the school feeding programme as it is cooked as per menu planned for learners.

6.5 Selling of Harvested Crops

In this section, the participants from the schools were asked to indicate if produce from the gardens were sold for commercial purposes and what the proceeds were used for. The response indicated

that only four schools (interviewee 2-5) were able to sell the produce grown in the garden. Whilst the other two schools (interviewee 6-7) informed that the crops are not sold. Interviewee 6-7 further informed that selling of garden produce depends on the crops produced from the garden. In this instance if the gardens have enough produce the school will be able to sell some of the produce and if the garden does not have enough produce it won't be able to sell. In terms of the harvested crops, Interviewee 2 informed that the crops are only for needy learners. Interviewee 3 further indicated that the crops produced benefit learners and the clinic.

The performance of the garden is vital in determining if the garden can generate income opportunities. Interviewee 2-7 indicated that the money generated supplement the buying of seeds and tools for sustaining the garden and this ensures that the garden has enough seed to plant for every season. Furthermore, it was stated that the money raised serve to pay stipends for people who assist in the gardens. It is crucial to ensure that opportunities such as these are utilised especially in communities experiencing poverty and unemployment. In a sense, it is possible to have self-sustainable school food garden projects as is indicated by the data.

6.6 Number of Learners Taking Harvested Crops Home

Another question was meant to establish if the interviewed schools had learners who take items grown in the garden home. Interviewee 2-7 indicated that all learners take veggies home. It is evident that most of the students eat food supplied from the school gardens. These schools are mostly located in low-income areas found in rural areas, farms and townships. Thus, most of these schools have learners that are susceptible to food insecurity because they come from poverty-stricken families. Moreover, Interviewee 2-7 informed that the learners are issued with vegetables to share with their families every Friday afternoon. The veggies given weekly allow the learners and their families to eat during the weekend.

6.7 School Holidays and Coordinating the Maintenance of School Garden

The question posed under this section sought to gain understanding of what happens to school garden during school holidays. The schools were also asked

to indicate who coordinates the maintenance of the school garden. All the participating schools indicated that the projects continue to function during school holidays. Furthermore, four of the participants indicated that the school garden projects were attended to by the Expanded Public Works Programme (EPWP) officials. Two schools indicated that the gardens are managed by the Community Work Programme (CWP) members. Participants indicated that the South African government employs EPWP and CWP officials to clean the school and manage environmental activities in the schools. The officials help with the project's upkeep especially when schools are closed and during holidays.

6.7.1 Maintenance and Responsibilities of Garden Coordinators

The schools were also asked to indicate who coordinates the maintenance of the school garden and to identify the responsibilities of such coordinators. All participants alluded to the fact that the maintenance of school gardens is vital for the project performance. The role of external help is more urgent during school holidays when teachers and learners are not available to maintain the school garden. If the school garden is not taken care of, the performance of the garden will be negatively affected. The respondents also indicated that EPWP and CWP workers make it possible to maintain the gardens. The maintenance of these projects is crucial to ensure that the school garden performs to its potential. The presence of EPWP and CWP officials during holidays also ensure that gardens are safe since garden may be susceptible to theft. The school garden coordinator is responsible to ensure that the activities for implementing and maintaining school gardens are properly performed. The responses show that it is vital for every school garden to have a maintenance coordinator who will ensure that the school garden is performing to its potential.

6.8 Garden Based Professional Development

The question in this section required beneficiaries to indicate if they received garden based professional development. Most of the schools had received professional training on gardening. Two participants had not received any training. Interviewee 3 indicated that it received training from GDARD. The training provided by GDARD was accompanied by the provision of garden tools. Interviewee 2 and 3 indicated that they received training from Arcelor Mittal in 2017, a local company in its corporate social

responsibility program. Two schools (Interviewee 5 and 7) indicated that training was received but did not indicate who provided training. A nearby clinic also provided training to (Interviewee 3). Based on these results, it is evident that both the private and public sector is playing a role in supporting the school garden project.

6.9 Assessment and Issues Concerning Sustainability of School Gardens

The schools were asked to identify the types of assessment conducted and to describe issues that concern sustainability of the school garden project. Interviewee 2-7 reported that the schools do not conduct assessments. The assessments of school gardens were conducted by GDARD. However, Interviewee 3 informed that the only assessment activity done is when they check around the school gardens in the early morning (8am) and afternoons for disease and pests on the crops. This is done twice a week. Interviewee 5 reported that an assessment was done once in 2019. A relaxed approach to assessments means that the performance of school garden projects takes a back sit, and the projects may be done to tick a box without deliberate expectations of an improvement in the outcomes. One of the ideal outcomes would be to drive the garden projects to sustainability.

7. Issues Concerning Sustainability of School Gardens

There are various ways to initiate and manage a school garden. In terms of the six schools interviewed the following are the issues as it concerns to sustainability of projects:

7.1 Commitment

The schools alluded to the importance of permanent and committed gardeners, a lack of commitment and passion can have negative effect on the performance of the garden. Interviewee 2 indicated that the people working in a project must be committed whereby the manager does not need to run after them. Interviewee 3 mentioned that a project must have dedicated people since the projects are intended to uplift the standard of food insecure communities. Interviewee 5 indicated that passionate people are required for developing the community especially in the schools. It is important to clarify objectives and scope so that team

members can be guided accordingly as to what is expected from them.

7.2 Capacity Building and Appointment of School Garden Coordinators

Interviewee 2 indicated that permanent gardeners will work to attain the sustainability of the garden. Interviewee 5 mentioned that it was crucial to train garden participants.

7.3 Resources Allocation

Based on the response from the six schools that were interviewed, five schools (Interviewee 2-6) indicated that school gardens require adequate space to be properly implemented. The other challenge that seemed to cut across all the six schools was the issue of water supply. Water is perceived to be the engine for the school gardens to perform. Interviewee 4 identified lack of water for plant production and believes that government needs to intervene in assisting schools to acquire boreholes for their crops. Interviewee 2 indicated that mistreatment by the leaders and co-workers can result in gardeners not coming to the garden anymore and there will be no one to maintain the garden. To the effect, staff development aimed at improving working relations is a relevant resource for garden projects. Interviewee 5 stated that a frequent monitoring system for school gardens and water supply in the form of irrigation system can boost sustainability.

7.4 Support Structures and Ethics

Interviewee 2 to 7 perceived that support structures were important in any organisation. They also indicated that the support from the school administrators, teachers, learners and the community would boost the morale for garden coordinators. This then shows that school garden projects are important and have value towards attaining food security. However, the participants raised concerns which call for a review in the recruitment of additional staff to enhance sustainable school gardens. It is evident that a lot of investments are required to ensure sustainable food security.

7.4.1 Performance Assessment of Public Funded School Food Gardens Projects

The authors found that performance assessment is vital to determine the relevance and fulfilment of

objectives. This was confirmed to be true through literature provided. It is highly important to assess the performance of food security project to determine if a project is yielding the desired outcomes, failure to assess the performance of the project will result in failure to detect if these projects are performing to the purpose they were established for.

8. Discussion

School gardens are not a new phenomenon (Diaz, Warner, Webb & Monaghan, 2017). School gardens have played an increasingly important role in engaging students in the natural environment and promoting the health benefits of eating fresh vegetables and fruit (Garwood *et al.*, 2016:4). Past experiences with school gardening have demonstrated that there is an abiding appreciation for its benefits but not enough sustainability in the practice to make school gardens a permanent feature of basic education on a national level (Yu, 2012). A sustainable agriculture is crucial to ensure food security. The literature shows that while there are specific curriculum links being made, school garden programs elicit a multitude of benefits in addition to enhancing student performance (Diaz, Warner, Webb & Monaghan, 2017).

8.1 Number of Students Who Benefit From the Garden Disaggregated by Type of Benefit

School gardens are poised to become a more integral part of learners' health and well-being (Yu, 2012). There is inclusion of the schools coming from low-income locations and this benefits learners who reside in food insecure households. The enrolment data is adequate to ensure that learners benefit for food security programmes. The results show that the school gardens are incorporated into the feeding schemes. There is evidence that learners are given vegetables to take home. Even though the results above shows that only two participating schools had learners participating in the school garden projects.

8.2 Income Generated From the Garden Sales

The results show that income is generated from the produced crops. However, the income is insufficient. The schools do not have the sales experience for selling their crops. The respondents also indicated that the income raised is used to run errands and miscellaneous requirements and for stipends.

8.3 Percentage of Beneficiary Households Who Practice Garden Skills

Little is known about the household who practice garden skills in their homes. We are aware that the department established the Household Food Security projects in respective communities. Growing school gardens may benefit the households in order to have food consumption on weekends and during school holidays.

8.4 Analysis of the Role Players and Mechanism Employed to Assess Performance

There are different forms of performance measurement and assessments. The researchers found that performance assessment is vital to determine the relevance and fulfilment of objectives. It is evident that schools do not conduct any formal assessments of the school gardens, since the assessments are mostly conducted by the Department of Agriculture (GDARD). The study found that there are dedicated personnel who manage the establishment of school garden throughout South African provinces. The identified officials included the Food Security Senior Adviser and the extension officers who are based in Vereeniging satellite office of the GDARD. The food security senior advisers are responsible for provision of extension services, managing and monitoring the school food gardens established in the SDM. Some officers are spread throughout the Gauteng province. The researchers discovered that there is no standard measure and indicators in place to assess the performance of public funded school food garden projects. The absence of performance indicators creates gaps in the performance of school food security projects. As a result, managers are unable to detect faults and they cannot see to it that school gardens attain their objectives. Performance indicators are vital, useful, provide informative information and most importantly, can create and detect opportunities that will improve the performance of school garden projects (Ossovski, de Lima & Da Costa, 2013:3).

School-based participatory vegetable gardens are a long-term strategy that complements supplementation and food fortification programmes to address hidden hunger. The success of school garden is dependent on existing political commitment and national policies that support and provide an enabling environment for the development and implementation of garden activities in schools (Araya, Araya, Amoo, Mofokeng, Makgato, Laurie

& du Plooy, 2020). Running a school garden also requires not only horticultural knowledge but also enthusiasm, organizational capacity and ability to mobilize parents and people in the area.

9. Recommendations

There is a growing interest in food system solutions to promote socio-economic and educational status of communities. Based on the results above, it is important to examine avenues towards a sustainable food security in order to impede hindering factors affecting the performance of school gardens. Therefore, the following recommendations are based on improving the performance of school gardens.

9.1 Develop and Review of Performance Measurement Systems and Indicators

Project assessment is crucial for project sustenance. The institution may develop performance measurement indicators which will assist in assessing project performance. Indicators will also help to detect faults and rectify them timely. For this, six steps were identified through literature review for the success of the organisation's performance:

Step 1: Define the desired performance measures based on departments mission, goals and objectives.

Step 2: Assess each performance measures?

Step 3: Selecting key performance measures to be reported to external customers, stake holders, and policy makers.

Step 4: Determine information needs.

Step 5: Clearly define each performance measures so that all users can easily understand.

Step 6: Establish the performance targets.

A performance measurement system must be carefully developed. This can be complemented by establishing guidelines to comply with the principles.

9.2 The Integration of School Garden Programs into Educational Curriculum

The authors recommend for the integration of school gardens into educational curriculum to ensure that school gardens are part of class activities.

Gardening has many proven benefits and incorporating it into the classroom can help bring all these benefits to the students. It will also help to inspire new ideas of learning and enabling learners to solve new problems.

9.3 Strategic Planning

The management of food security projects requires an intense plan of action that can contribute to long-term programme sustainability. A strategic plan allows school garden organizers to handle major obstacles. Some projects are discontinued, and the strategic plan would potentially lessen the challenges of recruiting a consistent volunteer base and help to distribute garden maintenance responsibilities.

9.4 Support and Partnership

Closer collaboration between agricultural organizations could potentially help bridge the gap between those with the gardening knowledge and interested teachers who have little or no personal experience in gardening. Partnership may enhance a sense of ownership among community members and the school. Furthermore, school garden projects produce a variety of vegetable and fruits, and the produce may be sold to local retail shops for income generation.

10. Conclusion

Assessing the performance of school gardens projects needs an effective performance measurement system. The government of South Africa must employ a performance measurement system that constitute of important and appropriate elements that are SMART. It is the government's duty to ensure that every citizen has access to food as it is stated in the South African Constitutional Law of 1996, section 26 and 27. Moreover, the bill of rights prescribes that "every citizen has the right to have access to sufficient food, water and social security". Thus, it is important for school gardens to perform for the government to realise this right. However, due to the lack of performance measures in SDM, proper tracking of the progress of school gardens is not done. It has been established in the literature that the lack of performance measures is linked to the lack of performance assessments and that this will lead into limited growth and poor performance of school food gardens projects. The

SDM must develop, implement and monitor a performance measurement system to assist with the assessments of the performance of school gardens.

Assessing the performance of school gardens is a challenge in the whole world. Thus, scholars and researchers are still developing performance measures that can assess the performance of school gardens and other food security projects. There has been a consensus among numerous researchers that the assessment of the performance of food security projects must involve and assess the four dimensions of food security: food availability, food accessibility, food utilisation and food stability according to the FAO definition of food security. The study concludes that school gardens are not performing to the best of their potential. However, they are still playing a pivotal role in combating hunger, food insecurity, promotion of nutritious food intake and income opportunities.

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