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# Incorporating Capacity Building as a Pathway to Environmental Stewardship for Public Schools in Kenya

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ABSTRACT

Education has been touted as a major driver toward the achievement of Sustainable Development Goals (SDGs). However, environmental stewardship takes a peripheral position in the pre-service and in-service training of teachers. As a result, most teachers and school heads that are supposed to champion stewardship activities in schools remain poorly equipped to undertake such activities. More so, a review of the literature finds glaring gaps in research in that most studies have only concentrated on student performance, teacher-student ratio, student discipline, etc. This study, therefore, sought to survey to establish the rationale for incorporating capacity building as a pathway to environmental stewardship in public schools in Kenya. The study sampled 260 public school teachers in the Githunguri Sub-county of Kiambu County in Kenya. Data from the teachers was collected using a structured questionnaire while 15 principals were also interviewed. Secondary data was collected through desktop reviews. The study established that the majority of the teachers had neither received pre-service (88.8%) nor in-service (90.4%) training on issues around environmental stewardship. A correlational analysis also established positive linear associations for capacity building, leadership roles, and stewardship activities ($R$ = 0,803) and ($R$ = 0,874) respectively. As a consequence, this hampered stewardship activities in schools within the study locality. For instance, the study established that most of the schools did not have a proper waste management system (88.1%) or even an environmental policy (75%). This study will inspire policy frameworks for future training of teachers to ensure that Kenya meets her SDG targets.

## INTRODUCTION

Environmental stewardship has its roots in the writings of Aldo Leopold who was an American scholar, author, environmentalist, and philosopher (Lopez, 2020). It entails taking actions on behalf of the environment either collectively or individually which is inspired by an understanding of the right relationship between man and the natural world and an altruistic and moral concern for current and future generations (Cockburn et al., 2018; Chan et al., 2016). It entails employing behaviors and technologies that are deliberately aimed at protecting, restoring, and sustainably using environmental resources (Bennett et. al., 2018).

The concept of stewardship in schools lays its foundation on UNESCO's Education for Sustainable Development (ESD). The ESD strategy was to reorganize the traditional functioning of schools in the areas of infrastructure, management and consumption of resources, teaching and extra-curricular activities as well as curriculum towards sustainability (Schröder, Wals and Koppen, 2020; Nyatuka, 2020; Gough, Lee, and Tsang, 2020). Since its inception, ESD has gained momentum globally and so stewardship of school environments under different names in different countries such as Green Schools (USA, Mexico, China, Taiwan, Hong Kong, Israel); Sustainable Schools (Mexico, Australia, United Kingdom); Resource Smart Schools (Australia); Eco-schools (Germany, France, Kenya, South Africa, India, Mexico, Turkey, Western Indian Ocean, United Kingdom). However,

despite the initiation of stewardship efforts in schools in Kenya that began on a pilot program in 2003, the program has faced numerous challenges including a poorly coordinated legal framework; lack of understanding of the ESD program; limited resources for the implementation of programs; overloaded curriculum; uncoordinated strategies and policies; inadequate pre-service and in-service training for teachers; lack of skills and capacity-building among others (Otieno, Wandabi and Dixon, 2020; MoE, 2017; Evans et al., 2016).

It is not in question that school leadership plays a crucial role in the success of any school program and so in environmental stewardship and the creation of eco-schools (Wong and Ng, 2021; Ebrahim, 2018). However, research has shown that most school heads remain ecologically illiterate or poorly equipped in handling environmental issues. This situation is greatly attributed to a lack of capacity building (Bopape, Mudau, and Msezane, 2021; Zachariou et al., 2013). As a consequence, most studies have emphasized capacity-building if stewardship activities and the development of green/eco-schools are to succeed (Wandabi, 2019a; MoE, 2018; UNESCO, 2018; MoE, 2017).

Capacity building entails the development of skills, attitudes, and knowledge in an individual or a workforce to boost performance and governance and ultimately achieve objectives and accomplish the mission (Castle, Tan, and LaGro, 2015;). Many studies have placed capacity building at the heart of the successful implementation of environmental stewardship programs in schools through the whole-institution approach (Mongar, 2022; Larri and Colliver, 2020; Alvarez-García et al., 2018; Ashmann and Franzen, 2015). As such, many studies and global conferences have emphasized the need to infuse environmental issues into pre-service as well as in-service teacher training programs (UNESCO, 2016; Álvarez-García et al., 2015). While efforts have been made to enhance pre-service training of teachers around environmental issues, studies reviewed showed that pre-service teachers in Israel, Canada, Turkiye, and Australia all exhibited a low understanding of environmental issues. All the studies further recommended the introduction of environmental matters in the training of future teachers (Álvarez-García et al., 2015; Yavetz et al., 2014; Tuncer et al., 2014).

Capacity building for teachers and educational leaders in Kenya, through in-service training, is tasked of Kenya Education Management Institute (KEMI) and the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) which are government institutions (MoE, 2017). Additionally, non-governmental organizations such as African Fund for Endangered Wildlife in Kenya and Kenya Organization for Environmental Education (KOEE) have also been involved in capacity-building among communities, students, and teachers as well as preparing training manuals, handbooks, and teachers' guides aimed at guiding stewardship activities in schools (Nyatuka, 2020; Wandabi, 2019b). The government has already spent Ksh 2.5 million in capacity building among teachers on ESD and has since reached out to 39 teachers in 6 schools and 3 colleges (RoK, 2021). Despite the efforts made, there has been slow progress which has been attributed to a lack of policy framework, lack of vision, awareness, and funding compounded with an overloaded and exam-oriented curriculum (Wandabi, 2019b; Opanda, 2013).

A capacity building shall play a crucial role in establishing eco-schools and enhancing environmental stewardship in schools in Kenya and beyond. However, it is apparent that Kenya as in many developing countries has remained behind in enshrining capacity building in in-service and pre-service teacher training programs and as such many teachers and school leaders remain ignorant when it comes to stewardship of school environments. Research also remains scanty in the area of capacity-building for environmental stewardship of school environments. No study was found to interrogate capacity building for environmental stewardship among teachers in Githunguri Sub-county. It is based on these gaps that this study sought to give insight into my second objective: to evaluate capacity building as a pathway to environmental stewardship in public secondary schools in Kenya.

## MATERIALS AND METHODS

### Conceptual Framework

This study was guided by a model adopted by Seng (2008). The model outlines three stages

involved in the creation of stewardship behaviours as shown in Figure 1.

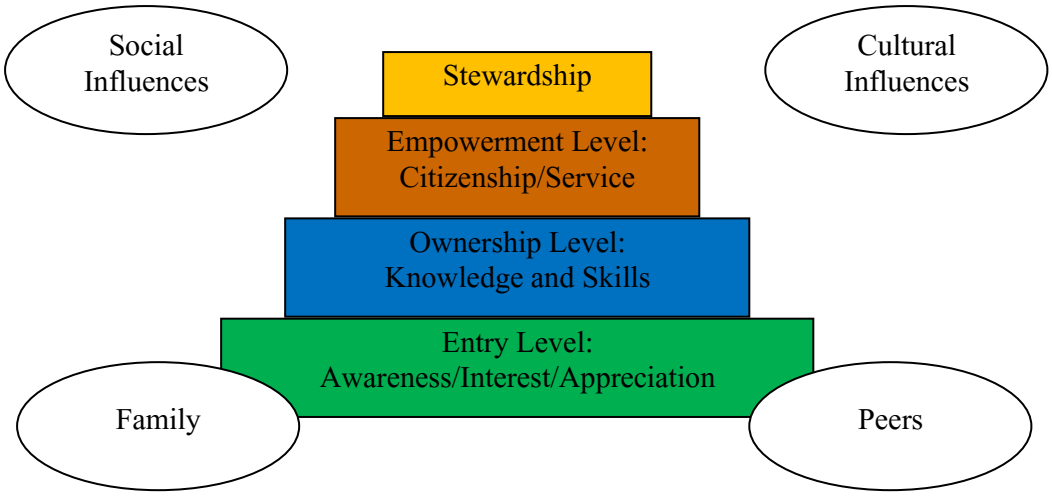


Figure 1. Progression toward Environmental Stewardship Behaviour
Source: Adopted from Seng (2008)

According to Seng's model, the pathway toward the creation of environmental stewardship behavior comes in three stages. The first stage is what he refers to as the entry-level. According to the model, this stage involves one having the knowledge of ecological issues and developing sensitivity to the environment. Seng's reasoning resonates with the thought in the Norm Activation Model (NAM). The model establishes a causal relationship where problem awareness comes first in the process of pro-environmental behavior. People must first be aware of environmental problems before they can take any other action to solve the problem (Steg and Nordlund 2018; Otto & Kaiser 2014). Seng therefore, asserts that in the case that individuals have limited knowledge and sensitivity to the environment, then deliberate efforts must be made to provide them with the required information. It is evident from Seng's model that knowledge of environmental issues that need our attention is the first step in the creation of stewards. Where the knowledge is amiss, Seng calls for capacity building (Seng, 2008). Seng's ideas resonate with a wide variety of studies that justify capacity building for teachers to attain success. For instance, empirical research has established a direct relationship between the years used to train teachers and their performance as teachers (Wang et al., 2014). Generally, the issue of capacity-building has been emphasized as a prerequisite for attaining all other SDGs. Target 9 of Goal 17 affirms the need for targeted capacity-building especially in developing countries to enhance national plans aimed at attaining the SDGs (Sondermann & Ulbert, 2021). His calls are in tandem with the views of this study on the importance of the capacity building.

Despite being aware of an ecological problem, people may or may not take up stewardship activities (Bennett et al., 2018). The people need to take ownership and personalize environmental problems. This is likely to create beliefs, ethics, and morals which have been argued to constitute an intrinsic motivation to act as stewards (Bennett et al., 2018). Individuals can then invest their energy, time, and even resources in addressing environmental problems (Seng, 2008). Arguments in Seng's model are in tandem with Schwartz's Norm Activation Model (NAM) of 1977 (Steg and Nordlund 2018). Schwartz's model refers this to as an ascription of responsibility and argues that personal norms for environmental stewardship grow stronger when people feel responsible for ecological problems without having to blame others (Steg and Nordlund 2018). Indeed, intrinsic motivation has been argued to yield more durable results in environmental actions as compared to extrinsic motivation (Cetas and Yasué 2017; Cecere et al. 2014).

The last stage before one becomes a true steward of the environment is the empowerment level. Seng argues that this level is characterized by intentions to act, assumption of personal responsibility as well as having knowledge of action

strategies. The intentions to act are, however, made strong when people feel that their actions can help solve environmental issues. This, in the NAM, is referred to as outcome efficacy (Steg and Nordlund 2018). Arguments in these two models imply that creating stewardship behavior is a continuous process of learning. As Seng puts it, continuous learning in a sequence of developmental stages will result in stewardship behavior. Arguments in the two models discussed here, therefore, inspired this study which calls for capacity building for teachers and educational leaders to enhance environmental stewardship in schools.

**Study Area**

The study was conducted in public secondary schools in the Githunguri Sub-County of Kiambu County in Kenya. The Sub-county has 39 schools 37 of which are public and 2 private schools. Out of the 37 public secondary schools, 28 are mixed-day schools while 9 are single-gender boarding schools (Githunguri Sub-county KCSE Analysis 2019, unpublished).

**Data Collection**

Data collection involved both primary and secondary methods. 1) Primary Data Collection: The study used a correlational study design to establish the relationship and associations between capacity building and environmental stewardship in schools in Kenya (Creswell, 2014; Creswell, 2012; Leedy and Ormrod, 2010). Random sampling was utilized to select a sample of 260 public secondary teachers while 15 principals were purposively selected from Githunguri Sub-county, Kiambu County in Kenya to form part of the sample. Large samples in correlational studies allow for the generalization of results from the findings (Norwood, 2010). Data from sampled teachers were collected using a close-ended questionnaire to ensure uniformity of responses and ease of analysis owing to the large sample (Afolayan and Oniyinde, 2019). Data from school principals were collected using an interview schedule to get a deeper understanding of the research problem. Quantitative data obtained were analyzed using descriptive statistics to establish the level of capacity building among teachers and school heads in environmental stewardship and the level of the association between the two variables. Descriptive studies are suitable for unexplored research areas since they do not explain why something happened (Punch, 2005). Analyzed data is presented in tables, graphs, and charts in the subsequent section. 2) Secondary Data Collection: Secondary data for the study was collected through desktop reviews in systematic literature reviews (Creswell and Creswell, 2018; Creswell, 2014).

## RESULTS AND DISCUSSION

### Capacity Building and Environmental Stewardship

The study sought to establish teachers and school heads/principals on capacity building around environmental stewardship. The results obtained are presented in Table 1 followed by a detailed discussion of the same.

Table 1. Analysis of Capacity Building in Environmental Stewardship

| No. | Parameter | Yes % | No % |
|---|---|---|---|
| 1 | Do teachers receive pre-service training on environmental stewardship/management? | $11.2 \pm 3.7^{a}$ | $88.8 \pm 2^{b}$ |
| 2 | Is there in-service training in environmental stewardship? | $9.6 \pm 4.2^{a}$ | $90.4 \pm 2.2^{b}$ |
| 3 | Have you attended KEMI or CEMASTEA training? | $10.8 \pm 3.8^{a}$ | $89.2 \pm 2^{b}$ |
| 4 | Was there training on ESD? | $0.8 \pm 7.3^{a}$ | $99.2 \pm 3.9^{b}$ |
| 5 | Have you received ESD training from any other organization? | $1.2 \pm 7.2^{a}$ | $98.8 \pm 3.8^{b}$ |
| 6 | Do you think training on environmental stewardship would enhance the proper handling of environmental resources in schools? | $98.1 \pm 26.2^{a}$ | $1.9 \pm 13.9^{b}$ |
| | Pearson Chi-Square value ($123.902^{a}$), Asymp.Sig. (2 – sided) = 0.000, letters $^{ab}$ in the same row differ statistically by Chi-square | | |

A fairly large number (*n* = 230,88.8%) of teachers in Githunguri statistically significantly indicated the absence of teacher pre-service training on environmental stewardship while only 11.2% (n=30) felt that teachers received pre-service training on environmental stewardship. Prior studies in Kenya have portrayed higher education as being bureaucratic, poorly equipped, and overly incapable of addressing fundamental issues rendering it ineffective and inefficient (Lowe and Prout, 2019). As such, the training institutions are likely not to produce teachers who can effectively handle issues around environmental stewardship. The findings of this study concur with a meta-analysis study by Álvarez-García et al., (2015) which found low levels of environmental knowledge among pre-service and prospective teachers in various universities and schools in Australia, Canada, Israel, and Turkey. Studies among pre-service Greek teachers also demonstrated that teachers possessed a moderate lack of any knowledge on environmental issues (Boubonari, Markos, and Krevrekidis, 2013), which contributed to low pro-environmental behavior among teachers. The case is the same in Jordan where although teachers were found to have a positive attitude towards the environment, their knowledge of environmental issues (Gheith, 2019). The role of the teacher in preparing environmentally conscious learners is undoubtedly huge (Gheith, 2019). However, it is clear from this and other studies that pre-service training of teachers has largely failed in incorporating environmental issues. The situation is likely to impede environmental stewardship activities in schools. This calls for deliberate efforts to infuse environmental stewardship knowledge into pre-service teacher training programs to enhance teachers' competency and confidence to execute environmental stewardship activities in schools (Kaya, and Elster, 2018; Dada et al., 2017; Arik and Yilmaz, 2017).

Further, the study established that a significantly low number of teachers (*n* = 25,9.6%) had received some in-service training on environmental stewardship while the greater majority (*n* = 335,90.4%) had not received any training on the issue (Table 1). In-service teacher training in environmental stewardship would improve teachers' professional performance while equipping them with the capacity to participate in decision-making to steward environmental activities/resources (Wandabi, 2019a; MoE, 2018; MoE 2017). However, studies have shown that in-service training programs for Kenyan teachers are rarely delivered, often attended by less than 30% of teachers, rhetorical and little has been done to improve them (Ngware, 2013; Bunyi et al., 2013). Besides, in-service teacher training such training have been blamed for being bureaucratic, poorly targeted, underfunded, and ineffective (Ngware, 2013). All these issues render in-service teacher training as being unreliable and ineffective in enhancing teachers' knowledge and skills to undertake environmental stewardship activities. It is no wonder that studies have depicted teachers as being poorly equipped or even ecologically illiterate on issues around environmental stewardship (Bopape, Mudau, and Msezane, 2021; Zachariou et al., 2013). The fact that pre-service teacher training has been depicted as having failed to equip teachers with relevant skills of environmental stewardship would mean that in-service training would come in handy. However, this study established that in-service training did little if nothing about the issue. As such, the majority of the teachers who are expected to guide stewardship activities in school are largely unknowledgeable, and as such, the program faces a bleak future.

Two government institutions are tasked with in-service training in Kenya, KEMI, and CEMASTEA (MoE, 2017). Despite the role they are expected to play, only a relatively small percentage (10.8%, n= 28) of the teachers indicated that they had attended KEMI/CEMASTEA training (Table 1). Notable also, is the fact that the majority (99.2%, n= 258) of those that had attended such pieces of training affirmed that such hardly focussed on environmental stewardship or ESD. The low number of teachers that had received capacity building around ESD is in tandem with what CEMASTEA itself reports. It affirms that since 2015, they have managed to train 876 stakeholders on the greening schools' program (Kilonzo, n.d). This number of teachers that have received training is extremely low. It is however important to note that the main mandate of CEMASTEA was to offer educational leadership training to enhance innovative practices in the teaching of science subjects (MoE 2017). It was not until the year 2015 that CEMASTEA was tasked by the MoE to spearhead the implementation of the

ESD program in Kenya (MoE, 2017). The resource center reports to have built capacity for teachers to address environmental issues including but not limited to climate change, waste management, environmental conservation, and energy management among others (Kilonzo, n.d). The lapse in capacity building has impacted negatively on the teachers' norms to yield positive outcomes towards environmental stewardship. This thus calls for constant and continuous capacity building of teachers to ensure that they influence the enactment of policies that would enhance sustainability. The slow pace of capacity building on ESD is also a wake-up call for the government to invest more in government institutions if the attainment of SDGs is to be realized.

The Kenya Education Management Institute (KEMI) is another government agency tasked with the in-service training of educational leaders. KEMI offers courses for different educational personnel including teachers, school heads, student leaders, and school clerks among others. While their website affirms that they have a short course on ESD, this study was not able to ascertain the number of school heads and teachers who have undertaken the course. The Ministry of Education also claims to have increased funding to KEMI in a bid to enhance in-service training on ESD but also fails to outline the successes it has had in in-service training (MoE, 2017). It is however important to note that KEMI offers self-sponsored courses that are not mandatory for teachers (Ongoto, Ogola, and Malusu, 2019). As such, many teachers had not received any in-service training say on personal effort (Table 1). From interviews conducted among principals who attended KEMI training in the study area, it was evident that environmental management did not feature in their training. All the interviewed principals pointed out the areas of training as financial management, leadership, human resource management, government policies on education, and ICT. In addition, KEMI itself acknowledges that despite massive investment in in-service training of educational leaders, the program has been less impactful, and little has been achieved in the effective management of schools (KEMI, 2012). Again this exposes the deficiencies in teacher in-service training that are inhibiting the implementation of ESD in Kenya and the consequent stewardship of the school environment and environmental resources (MoE, 2017).

Other than the government institutions, other non-governmental organizations (NGOs) are also involved in capacity building around ESD. However, as shown in Table 1 very few teachers (1.2%, n=3) had received training from such NGOs. One such organization is Kenya Organisation for Environmental Education (KOEE). The organization reports that it had trained up to 15,000 teachers on water, waste, energy, and biodiversity conservation (KOEE, 2019). Another study has also reported that about 100 teachers are trained annually on how to implement the eco-school program and up to 5000 have so far received training. The study asserts that training is aimed at equipping teachers with the necessary skills to solve environmental issues in their local environments and act as eco-school ambassadors (Otieno, Wandabi, and Dixon 2020). Despite the efforts by NGOs to create capacity among education stakeholders, very little has been achieved to this end. The studies also possibly point to a skewed kind of training where some parts of the country have had more such programs than others. Indeed, this is demonstrated by Otieno, Wandabi, and Dixon (2020) who show a serious regional imbalance in eco-schools in Kenya with Western Kenya having 35.6% while Central Kenya has only 4.5%. The low levels of training in the study area, which is part of the larger central region, probably explains the low number of eco-schools in the area.

Finally, the majority of the sampled teachers (98.1%, n= 255) and principals were in agreement that capacity building on environmental stewardship is likely to enhance the better management of environmental resources in schools (Table 1). The findings are in coherence with Naidoo, (2019) who asserts that proper professional development and sound training could yield exemplary leadership skills among principals. Capacity building for teachers would therefore improve the curriculum and pedagogy to reflect the calls by UNESCO that root the teaching for sustainability and achievement of all other SDGs (Xia et al., 2020; Leicht et al., 2018). This study, therefore, calls upon the government of Kenya to enhance capacity building for educational stakeholders to ensure that the ESD program is well understood, and implemented through eco-school/green school programs which

will enhance environmental stewardship in schools. The eco-schools will further serve as models for the larger community all in a bid to attain the SDGs by the year 2030.

**Teachers' Capacity Building and Environmental Stewardship Practices**

The study sought to establish the relationship between teachers' capacity building, leadership roles, and environmental stewardship in schools. The study established that capacity building for teachers correlates strongly ($R$ = 0.803) with the understanding of their leadership roles in enhancing environmental stewardship. More so, capacity building positively correlates ($R$ = 0.874) with stewardship practices that teachers engage in to safeguard the environment (Table 2). The findings are presented in Table 2 and a discussion follows thereafter.

Table 2. Correlation Analysis between Capacity Building and Environmental Stewardship Practices

| Parameter | | Capacity building | Stewardship practices | Leadership roles |
|---|---|---|---|---|
| Capacity building | Pearson Correlation | 1 | 0.874** | 0.804** |
| | Sig. (2-tailed) | | 0.000 | .000 |
| | N | 260 | 260 | 260 |
| Stewardship practices | Pearson Correlation | 0.874** | 1 | 0.784** |
| | Sig. (2-tailed) | 0.000 | | 0.000 |
| | N | 260 | 260 | 260 |

**. Correlation is significant at the 0.01 level (2-tailed).

This study established capacity building positively correlates with teachers' steward practices as shown in Table 2. This means that teachers who know environmental issues are more likely to initiate stewardship activities in the school and elsewhere in the community while those that lack the knowledge are less likely to engage in environmental activities. The findings in this study are however contrary to a study conducted in Malaysia which concluded that strong environmental awareness did not necessarily imply greater pro-environmental behavior (Mei et al., 2017). However, a meta-analysis study of Bhutan, Australia, and Turkey established that teachers' lack of professional development in environmental issues contributed to a lack of confidence to address environmental issues and make wise decisions on the same (Mongar, 2022; Boubonari et al., 2013; Kadji-Beltran et al., 2013). Capacity building is therefore expected to increase knowledge among teachers on environmental issues which will consequently improve their pro-environmental behavior and stewardship activities. This, therefore, call for stakeholders' concerted efforts to infuse environmental knowledge in both pre-service and in-service training programs for teachers. Table 1 shows teachers' views on the same issue. Teachers were of the opinion that knowledge of environmental issues was likely to assist them in better handling environmental resources in schools. Similar views are expressed by other scholars. For instance, it has been argued that the relevance of ESD in pre-service teacher training will directly influence teachers' knowledge, skill, and confidence when teaching the same (Arnold and Mundy, 2020; Thomas et al., 2017).

**Influence of Capacity Building on Leadership Roles for Environmental Stewardship**

Having established that capacity building among teachers in the study area was inadequate or missing altogether, the study sought to establish the influence that it had on environmental stewardship efforts. The data obtained are presented in Figure 2 below.

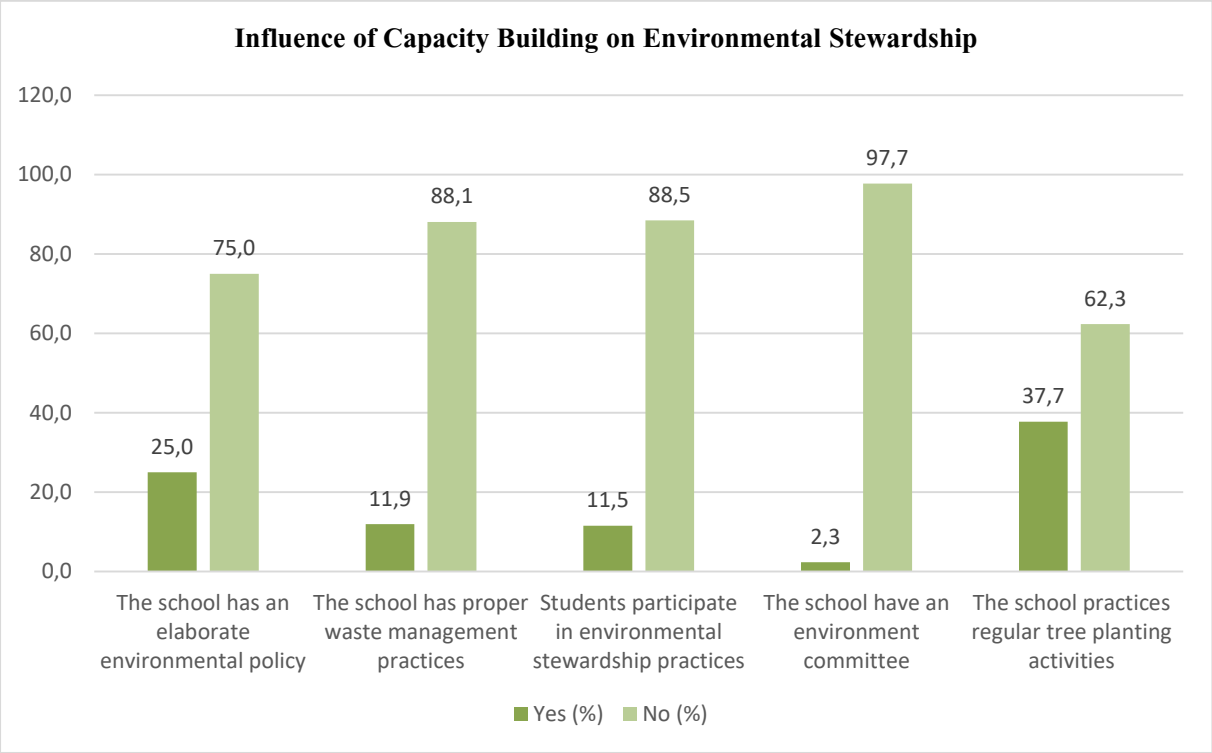


Figure 2. Influence of Capacity Building on Teachers' Leadership Roles in Environmental Stewardship Activities

Figure 2 shows the consequences of inadequate capacity building on stewardship activities in schools. As expressed in Figure 2, most teachers in the study area affirmed that their schools lacked a comprehensive environmental policy (75%) while another 88.1% affirmed that their schools did not have proper waste management practices. An even higher number (88.5%) affirmed that students in their schools did not participate in any stewardship activities with 97.7% of the sampled teachers expressing that their schools did not have an environment committee. Lastly, 37.7% of the sampled teachers ascertained that their schools engaged in the regular planting of trees. While this study acknowledges that other factors could have played part in the poor performance of schools as far as environmental stewardship is concerned, low levels of knowledge and skills as a result of inadequate capacity building is also likely to have played a major part in this. Indeed, studies have shown that capacity building is necessary for creating knowledge and leadership skills to undertake stewardship actions (McConney et al., 2014). Indeed, the importance of capacity building cannot be ignored in enhancing stewardship in school and the poor performance displayed in Figure 2 would have resulted in inadequate capacity building for teachers. This study, therefore, calls for a well-coordinated effort to ensure that in-service and pre-service teacher training programs address environmental stewardship if the ESD program is to see the light of the day and if indeed Kenya aspires to meet the SDGs.

## CONCLUSION

Capacity building for environmental stewardship in public schools is critical for sustainability. The critical role the leadership in public schools play sheds light on why they need the urgent capacity to enhance environmental sustainability. The benefits of environmental stewardship are numerous. However, it will have lasting impacts only when modeled by the school leadership. The results from the study underscore the essence of capacity building as a critical pathway for environmental stewardship which supports SDG 4 on education. Further, the institutions mandated with in-service teacher training on environmental matters haven't fulfilled their mandate. Consequently, teachers lack the knowledge and skills to enact programs that would enhance environmental stewardship in their communities. For this reason, continuous capacity building remains a viable option that would enable

the realization of environmental stewardship in schools and communities in Kenya. The study calls upon the government to re-orient pre-service and in-service teacher training to address more environmental issues, ESD and consequent achievement of Agenda 4 of the Sustainable Development Goals is to be achieved.

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