



# The Implementation of Environmental Education in Geography (Grades 8–10) in the Caprivi Region, Namibia

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## *Abstract*

UNESCO (1995) notes that education should be easily adaptable to sudden shifts in conditions in a world of rapid change since environmental challenges are dynamic. This paper is based on a study carried out in secondary schools in the Caprivi region in Namibia (currently re-named the Zambezi region). The article reports on mixed methods of approach to arrive at an in-depth understanding of the extent to which environmental education is implemented in the curriculum for Geography, specifically for grades 8–10. The data was generated through a self-assessment questionnaire that was sent to all grade 8–10 Geography educators in the region. In addition, interviews were conducted with a sample of educators and a local environmental education officer. Focus group discussions were held with learners from five schools. The findings revealed, among others, that educators had sufficient knowledge and understanding of environmental concepts and issues. However, educators had limited knowledge of environment-related skills and attitudes required, and did not use a variety of teaching approaches or alternative assessment regimes. Educators understand the significance of indigenous knowledge in geographic education, but the research findings also indicate that stakeholders' participation in school environmental education initiatives needs to be strengthened. The article provides recommendations that might improve the implementation of environmental education in schools.

**Keywords:** Geography, competencies/learning objectives, educational processes, outdoor activities, sustainable development, indigenous knowledge.

## *Introduction*

Since independence in 1990, the Namibian government has given high priority to environmental concerns. Article 95 of the National Constitution (GRN, 1990) refers to the promotion of the people's welfare through sustainable use of resources. Namibia has ratified a number of international agreements concerning the environment, such as the Convention on Climate Change (1992), the Biological Diversity Convention (1992), Agenda 21 (1992), Combating Desertification (1994) and the Basel Convention (1999) (MoET, 2008:7).

Namibia's Vision 2030 (GRN, 2004) and Third National Development Plan of 2008 (NDP3) identified sustainable development as an important national development strategy (GRN, 2008). A National Environmental Education Policy was developed in 1999 with the assistance of the Namibia Environmental Education Network (NEEN) and the Ministry of

Education (MoE). It was stressed that environmental education should be incorporated into the formal education curriculum as a cross-curricular issue. According to the National Curriculum for Basic Education, basic education for the future society should focus on:

atmospheric, land and water pollution from crop lands or mines, and minimalising pollution from urban and industrial areas, to ensure that farms and natural ecosystems are productive and sustainable socially, economically and ecologically and to ensure that there is high quality, low impact tourism and food security. (MoE, 2010)

The Geography curriculum content, skills and values can contribute significantly towards achieving these objectives.

### **National research**

At a national level, there have been a number of studies on environmental education in Namibian schools since 2000. For example, in his study in Namibian schools, Kanyimba (2002) concluded that environmental education revolves around the integration of knowledge dimensions with a lack of integration of values and attitudes, and to a lesser extent, on the integration of some action and skill dimension of the environment. This was echoed by Haindongo (2014) who found that, in Namibia, subjects such as Biology concentrated on cognitive information about the ecology (education about the environment). She further found that educators lacked professional development support to assist them in teaching environmental education. Investigating how Geography educators were implementing enquiry-based learning through fieldwork, Simasiku (2012) found that, although educators engaged learners in the suggested activities, the findings indicated that educators faced limitations in terms of integrating environmental learning into the Geography curriculum.

### **Regional research**

On a regional level, a study carried out in six primary schools in the Empangeni district in KwaZulu-Natal in South Africa by Makhoba (2009) found that environmental education topics were taught selectively, with preference to narrative teaching methods; while the studies by Monde (2011) and Kalimaposo and Muyela (2014), in selected high schools in Zambia, established that most educators lacked knowledge and resources to support the implementation of environmental education. Mukoni's (2013) research tried to establish if environmental education had any transformative impact on secondary school educators' and learners' behaviour towards the environment, through an assessment of their actions within the school and the community in Zimbabwe. The significant finding of Mukoni's study was that environmental education in schools was mere 'greening' of the curriculum, with a factual approach to environmental education at the expense of action competencies. All these studies exposed deficiencies in the teaching of environmental education in general, hence the significance of a broader perspective for the study, in order to explore how environmental education is implemented in Geography in Namibia.

### **Conceptual framework**

The study is informed by a social constructivist theory of education. The approach to teaching and learning in Namibia is based on a paradigm of learner-centred education (LCE). The starting point for teaching and learning is the fact that the learner brings a wealth of knowledge and social experience to school, which is continually appropriated from the family, the community, and through interaction with the environment. Learning in school must involve, build on, extend and challenge the learner's prior knowledge and experience. Hungerford (2001) notes that the characteristics of constructivism include authentic experience, social interaction, connections to prior knowledge and diverging cultural perspectives. This is supported by Ornstein and Hunkins (2004).

Environmental education in southern Africa is generally espoused to include the social, economic, political and biophysical aspects. Palmer (2003) defines environmental education as an interdisciplinary and holistic form of education geared towards action and change and which promotes the use of participatory learning, learning by doing and action-based methodologies. Waite (2010:112) reminds us that learning outdoors could address broad aims for education such as: physical well-being, social and emotional well-being, and deeper levels of learning. As a subject, Geography tries to understand how people intervene in the world's natural and social processes and in turn, how spaces, places and environments are affected by such interventions. Agenda 21 and the Voice of Eagle recognise the immense contribution that indigenous people, communities and knowledge bases make that can help to achieve a more environmentally sound future. Meanwhile, Huckle and Sterling (1996) caution that educational institutions need to be reoriented towards helping learners learn systemic, future, integrated, problematised and creative values analysis and moral reasoning. It is essential to also note that learning related to the curriculum extends beyond the classrooms the school community and parents also play a role in supporting and extending this learning.

Constructivist epistemology shapes much of the contemporary educational thinking and assessment practice in Namibia. As such, assessment deals with both quantitative and non-quantitative descriptions of events to show the levels of a learner's improvement. Constructivism emphasises the use of dynamic assessment practices which recognise direct measures of a learner's potential for learning and development in a holistic way. In environmental education, assessment is often centred on awareness, values, attitude change, or the measurement of reduced impact.

### **Research problem**

The research problem lies in the fact that the goals of the National Environmental Education Policy are not being fully realised in Namibia. The main reason for this is that the responsibility for putting an environmental education policy into practice was devolved to regions and schools according to the Education Act of 2001 and the National Curriculum for Basic Education (2010). From 2001 until 2005 Namibia, through the National Institute for Educational Development (NIED), embarked on a comprehensive revision of the curriculum for grades 1–10. Environmental education is one of the cross-curricular issues that were integrated into the curriculum aims, objectives, learning content and assessment of different

subjects. The organisation known as Support Environmental Education in Namibia (SEEN) – supported by DANIDA (the Danish International Development Agency) – helped the MoE with the integration of environmental education processes through professional development, curriculum development, the provision of materials and school-based implementation (in a limited number of pilot schools). It is therefore interesting to find out how schools consolidate this foundation and these experiences to implement environmental education in schools.

Since schools implemented the environmentally integrated curriculum without structured capacity-building programmes for educators at a local level, the researchers sought to determine how schools were implementing the intended curriculum. Although learning support materials were produced and sent to schools, it was important to understand how these materials affected educators' and learners' perceptions of their environment and teaching/learning processes.

It is of interest to learn how schools coordinate environmental education activities at the local level with the support of the approved environmental education policy. It is also relevant to determine the degree to which the national syllabus statements are prescriptive or flexible in allowing educators to integrate aspects of their local environment without compromising the quality of education.

### **The research purpose**

Based on the research problem, the purpose of the research was to determine how schools in the Caprivi region in Namibia implement environmental education in grade 8–10 Geography; with the objective of determining and exploring the extent to which Geography educators have the required knowledge and understanding of environmental education to implement the relevant processes, strategies and assessment in schools through the Geography curriculum (since environmental education is a cross curricular issue in this curriculum).

The paper also assesses:

- The level and nature of environmental skills and attitudes that grade 8–10 learners require, as seen from the educator's perspective;
- The extent to which outdoor activities complement the overall objectives of Geography;
- Geography educators' understanding and perceptions of the significance of indigenous knowledge as a resource in the school curriculum; and
- The extent to which learners understand their environments, issues, learning processes and the presence of school environmental education policies, and how well they are applied.

## *Methodology*

### **Research design and method**

The research design was a mixed-methods research approach, which included aspects of both quantitative and qualitative approaches. The purpose of mixed-methods research is to build on the synergy and strength that exists between quantitative and qualitative research methods in order to understand a phenomenon more fully than is possible using either qualitative or quantitative methods alone (Gay, Mills & Airasian, 2006). Qualitative data can be used to

supplement, validate, explain, illuminate or reinterpret quantitative data gathered from the same subject (Bogdan & Biklen, 2007; Palmer, 2003).

### **Data collection**

In order to gather data, multiple data-collection instruments for educators, learners and the environmental education officer was used. The semi-structured interview questions were designed to encourage participants to describe their experiences in implementing environmental education in the curriculum and in daily life. In addition, educators from all 47 schools in the region offering grade 8–10 Geography completed a self-assessment instrument by giving themselves a rating of one to four for each of the 24 environmental education practice indicators. These indicators focused on knowledge of environmental education (KEL), teaching and learning (TL), learning support materials (LSM), and extracurricular and environmental action (ECEA) programmes. Educators also responded to 32 other environmental indicators on a nominal scale, including environmental education features in schools, school environmental policy issues, information sources, and educators' training needs. Ruane (2005) claims that a good questionnaire can 'stand on its own' without requiring personal contact with respondents. An interview was also held with a local environmental education officer, together with a focus group discussion with learners. Neuman (2006) and LeBeau (1997) affirm the significance of enhancing, validating and triangulating data when various instruments are used; while Gay, Mills and Airasian (2006) attest to the essence of piloting, which was carried out in this study. Lastly, 35 learners' exercise books from five schools were inspected to verify the nature of classroom activities.

### **Sampling**

The research population in this study were Geography grades 8–10 learners and educators, and a local environmental education official. In support, Neuman (2006) and Ruane (2005) highlight that the primary purpose of sampling is to collect specific cases that can clarify and deepen understanding so that the researcher learns about the processes of social life. Five schools participated in the interviews and focus group discussions. Random numbers were assigned to schools and used to select participating schools in each category: urban, peri-urban and rural. This ensured that every school had equal chance to participate. In addition, the self-evaluation instrument/survey questionnaire for educators was sent to all 47 schools in the region with grades 8–10.

### **Data analysis**

Analysis of data involves organising, breaking down and synthesising it, as well as searching for patterns, and discovering new information to tell others (Bogdan & Biklen, 2007; Neuman, 2006). In quantitative research, graphs were used to illustrate the results of the research. Data was analysed inductively, by categorising and organising it into patterns that produce a descriptive and narrative synthesis. In this study, transcripts of interviews and focus group discussions were typed out, and the individual thoughts and ideas of each participant were separately numbered.

The statements of each participant were categorised and coded with respect to the research themes and emerging items. The educators' self-assessment rating questionnaires were analysed

and interpreted by using simple statistical procedures; for example, descriptive statistics such as distribution frequencies. The Statistical Package for the Social Sciences (SPSS) was used to see if there were associations or connections between any of the variables measured by the survey questions.

### **Ethical considerations**

The researchers had a duty to not put participants in a situation where they might be at risk of harm as a result of their participation. Furthermore, Neuman (2006) and Bogdan & Biklen (2007) remind us that the researcher protects the privacy and identity of participants. To that end, the researchers took the following specific steps to ensure that the participants' privacy and rights were protected:

- Informed consent was assured by allowing respondents sufficient knowledge and comprehension of the purposes and intentions of the study;
- The protection of respondents was guaranteed through anonymity; and
- The study's credibility is supported through adherence to the actual audio recordings by either paraphrasing or using actual excerpts from these recordings.

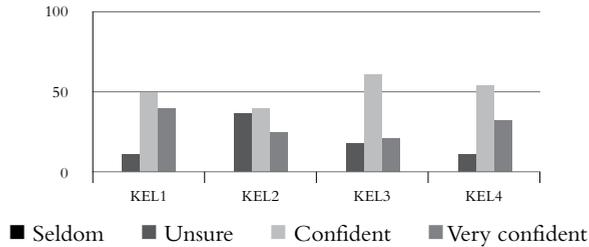
## ***Results and Discussion***

### **Educators' knowledge of environmental education (KEL)**

The result of the empirical study (Figure 1) reflected that most educators (61%) were confident about their knowledge of the holistic concept of the environment (KEL3), while 50% of educators indicated that they were confident – 39% were very confident – about their knowledge of facts relating to environmental education topics such as population, biodiversity, environmental degradation and risks (KEL1). This was confirmed by educators who identified, in the interviews (qualitative research) the environmental issues they teach from the syllabus such as deforestation, overgrazing, pollution, population and migration. However, quite a high number of educators (36%) indicated that they were unsure about environmental challenges in Namibia (KEL2). This suggests that educators do not use various sources of information to acquaint themselves with environmental challenges at a national level. The majority of educators were confident and very confident (54% and 32% respectively) about their knowledge of the environmental education policy for the formal education sector (KEL4).

Knowledge with understanding about, through, or for the environment enables us to critically evaluate issues and situations in light of the informed understanding (Palmer, 2003; Schnack & Jensen, 1997). Because educators are confident in their knowledge of environmental education (KEL4), it seems as if the curriculum should be flexible enough to include the local context and make provision for educators' initiatives. The national curriculum should not negate educator involvement or focus on national control. There is a danger that the curriculum content will require learners to deliver rather than interpret. This could result in the approval of one set of knowledge and skills, leading many schools to become dependent on a single textbook, with one particular series dominating.

**Figure 1.** Educators’ knowledge about environment



Kel1: Knowledge of factual information

Kel2: Knowledge about environmental challenges in Namibia

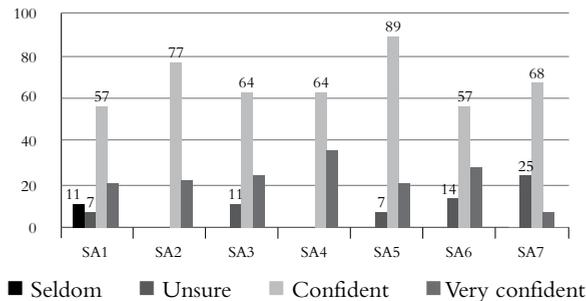
Kel3: Knowledge about a holistic conception of the environment

Kel4: Knowledge about the environmental learning policy for the formal education sector

**Skills and attitudes (SA)**

Skills and attitudes represented by the graph are listed below the graph in Figure 2 which shows that educators felt confident in most of the skills and attitudes included in the questionnaire (ranging from 57–89%); only a few (0–25%) seldom taught these skills or attitudes or were unsure about teaching them. An analysis of interviews conducted with the educators, however, suggested that educators do not understand the kind of skills and attitudes that learners need to acquire in order to contribute to the health of the environment. In most cases, they incorrectly referred to some activities as skills. Only a few reported attempting to mediate activities, which they referred to as skills, such as tree planting and cleaning of the school grounds.

**Figure 2.** Educators’ environmental skills and attitudes



SA1: Communicating the way people’s cultural activities affect the environment

SA2: Communicating the way individual people affect the environment

SA3: Identifying their own attitudes and values towards an issue of the environment

SA4: Awareness that there may be more than one way to solve environmental issues

SA5: Skills needed to contribute towards the health of the environment

SA6: Positive attitudes towards the environment

SA7: Value cultural practices and indigenous knowledge

Neuman (2006) identifies essential environmental and geographical skills, such as the expression of ideas and observation through telling simple stories, collecting, classifying, analysing and interpreting data and statistics, and evaluating information from a variety of sources. This is supported by Ruane (2005) and Sterling (1999), emphasising the imperative for learners to think critically, identify causes and consequences of environmental problems, and seek consensus when dealing with contested environmental issues.

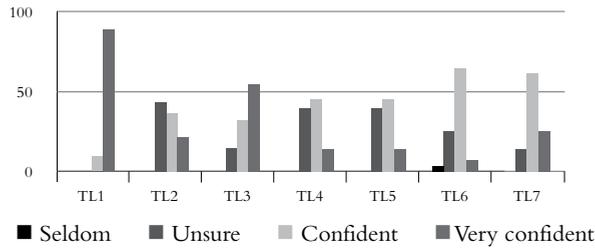
### **Teaching, learning and assessment (TL)**

Swarts, Dahlstrom and Zeichner (1999) suggest that the starting point for teaching and learning is the fact that the learner brings to school a wealth of knowledge and social experience gained from the family, the community and the environment. It is for this reason that the MoE (2010) is of the view that learning should be a social process rather than simply a process of transmitting facts. Willingness and active participation are central to the process. The graph in Figure 3 reveals that 54% of teachers were confident to teach with the learner-centred approach. This is not an unexpected finding, considering that Namibia follows a social constructivist philosophy. Literature shows that if learners are involved in value clarification methods such as moral dilemmas, they will be able to see and hear the connection with the real world outside their frame of reference. Moral dilemmas test the environmental convictions of learners, thus facilitating intellectual growth. Miller (2004) and Schnack and Jensen (1997) maintain that this fosters learners' awareness and trains them in how to reach a decision when faced with controversial environmental issues (responsibility and confidence). In interviews, educators cited the use of lecturing, group work, and question and answer methods. This was supported by learners who participated in focus group discussions.

From Figure 3 it is clear that the majority of educators (89%) were most confident to teach environmental issues (TL1) and least confident in using the local environment to do practical activities (TL2). In interviews with learners, they commented that they were rarely required to do practical outdoor activities. Outdoor activities are an example of activities that provide opportunities for learners to develop skills for data gathering, including social skills such as cooperation and appreciation (Palmer, 2003; Schnack & Jensen, 1997). It is therefore a concern that a considerable number of educators did not use problem-solving skills when teaching environment-related issues (TL4). Researchers such as Mukoni (2013) remind us that schools and learners should be involved in practical actions to solve environmental problems in their context.

It was impressive that such a high percentage of educators (61%) reported to be confident – and 25% very confident – that they continuously assess learners' tasks (TL7). Their continuous assessment tasks are, however, limited to chalkboard activities. This study revealed that learner activities had no link with continuous assessment tasks such as projects where a learner's finished product can be assessed using a criterion reference system. Inspection of a sample of learners' exercise books revealed that activities of less than a page were classified as projects.

**Figure 3.** Educators’ rating of teaching and learning indicators in schools

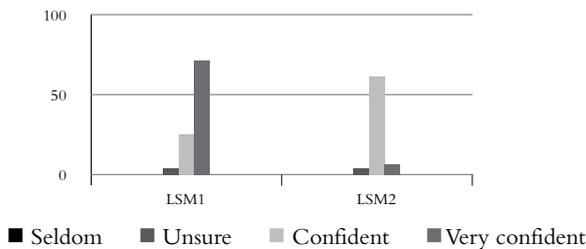


- TL1: Feeling of being comfortable talking to learners about EL
- TL2: Regular use of the local environment to do practical activities
- TL3: Teaching in a learner-centred way
- TL4: Use of problem-solving skills
- TL5: Teaching importance of identifying people in environmental issues
- TL6: Considering ecological cost and benefits of design
- TL7: Continuous assessment practices and activities

**Learning support materials (LSM)**

Learning support materials are critical for the successful implementation of any educational programme. Figure 4 shows educators’ ratings on the use of existing official materials (such as text books) (LSM1) and educators’ initiatives to gather and develop their own supplementary materials (LSM2). This was supported by the results of interviews with educators.

**Figure 4.** Educators’ use of learning support materials

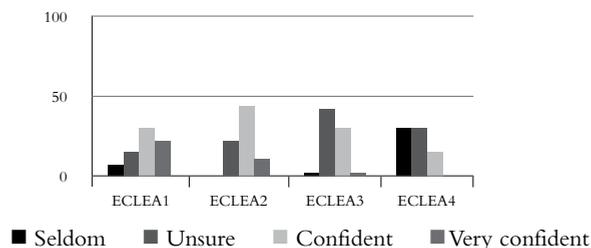


In the self-assessment instrument, 71% of educators indicated that they were confident that they use the existing official learning support materials to teach environmental education-related topics (LSM1); 4% of educators were unsure. Only 7% of educators on the self-assessment instrument specified that they were very confident, and 61% said that they produce or collect supplementary materials/resources to teach environmental education-related matters (LSM2). The result of interviews with educators referred to government ministries, internet, and television documentaries as sources for supplementary materials.

### Extracurricular programmes and community support in schools (ECEA)

Figure 5 shows educators' involvement in extra-curricular and environmental action as represented by the listed indicators.

**Figure 5.** Educators' participation in the extra-curricular and environmental action in schools



ECEA1: Involvement in extra-curricular activities at school

ECEA2: Communicating responsible citizenship

ECEA3: Communicating various levels of action

ECEA4: Involvement in community EL activities

Figure 5 shows that 21% and 11% of educators indicated that they were unsure and very unsure about their involvement in extracurricular activities respectively. The only common activities cited in interviews were organising learners to participate in a school manual work day and, to a lesser extent, in tree planting and vegetable gardening. Educators did, however, express a willingness to participate in environmental clubs if these were formed at their schools. The quantitative research also revealed the weak involvement of educators in the environmental community education activities (ECEAs); 39% of educators were unsure about their involvement (ECEA4). This was found mostly in urban schools and among female educators. Educators also indicated in interviews that parents are seldom involved in the environmental education activities of schools. Parental involvement was limited to lending garden equipment, such as hoes and spades, during the clean-up activities on school grounds. Schools did not have special national and international environmental days integrated into their school programmes; only a limited number of schools participate in such days. Educators appear to regard activities taking place at school as being entirely separate from those that occur outside of school; therefore, they fail to see that these activities can be complementary and thus beneficial.

### **Use of outdoor activities and the educators' perception of indigenous knowledge (IK)**

Educators interviewed were aware of the importance of indigenous knowledge in terms of sustainable and unsustainable ways of living. Stressing the essential role of local experiences, Schnack and Jensen (1997) suggest that, in order to understand something, we need to explore the context within which the meaning arose. Indigenous knowledge is a rich resource and a path to sustainable living that could be integrated into daily teaching of environmental issues in schools. We can learn from both the positive and negative aspects of indigenous knowledge of local communities. Miller (2004) supports the explanation that surveys carried out in the United States indicated that environmental beliefs of modern society are beginning to weaken and shift toward more environmental views of cultural creation.

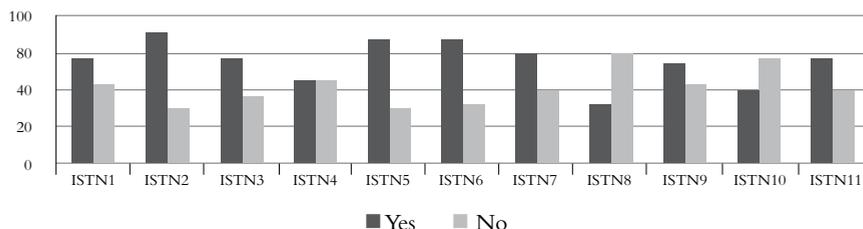
Evidence from the quantitative research also indicated that 43% of educators were unsure about whether they used their local environment for practical activities (TL2 in Figure 3). The majority of these were female educators from peri-urban areas.

### **Issues covered in the school environmental policy**

Most schools (86%) did not have environmental education school policies, action plans (89%), or environmental education coordinators (96%). They also rarely participated in national and international environmental days, as mentioned earlier. Schools still focus on addressing issues related to the use of water, littering and health while paying little attention to waste reduction, the use of energy-saving measures, the preservation of biodiversity and the use of environmental clubs in the daily aspects of school life – especially in rural schools.

### **In-service training needs for Geography educators (ISTN)**

The Geography educators were asked what their training needs were. From Figure 6 it was clear that most educators indicated that they needed more professional training on: assessment (71%) (ISTN2); letting learners participate in learning (68%) (ISTN5); greening of their schools (68%) (ISTN6); and field-work techniques (61%) (ISTN7). In fact, educators only indicated a low need for training in philosophical underpinnings (32%) (ISTN8). With this in mind, it appears that professional development for Geography educators should focus on pedagogical knowledge – environmental centres can play an important role in this.

**Figure 6.** In-service training needs for Geography educators

ISTN1: Action research on environmental learning

ISTN2 : Assessment in environmental learning

ISTN3: Local to global learning themes

ISTN4: Case studies on environmental learning practice

ISTN5: Participation of learners in decision-making

ISTN6: Greening of school grounds

ISTN7: Fieldwork techniques

ISTN8: Philosophical underpinnings of environmental learning

ISTN9: Teaching methods in environmental learning

ISTN10: Environmental audit at schools

ISTN11: Environmental learning integration in schools

### The role of the environmental education officer

The environmental education officer of the Ministry of Environment and Tourism in the Caprivi region maintained that there is no environmental education centre in the region. These centres can play a role in teacher-training as well as assisting in learners to improve their environmental knowledge. A plan is underway to construct two environmental education centres, one for the Caprivi and the other for the Kavango region. The officer is currently involved with two schools implementing outdoor and sustainable living programmes, so environmental education centres will be a considerable asset. The vastness of the area of responsibility (encompassing 419 schools) and transport problems were cited as hampering the implementation of environmental education programmes in the regions.

The office of the regional environmental education officer (responsible for the environmental education centre) is expected to coordinate field visit programmes, together with the MoE. A regional interministerial committee could be set up to facilitate these programmes, enabling learners to develop an understanding of concepts such as conservation, preservation, beautification and stewardship.

### *Conclusion and Recommendations*

This research has contributed to a better understanding of how Geography educators implement environmental education in schools. Although, overall, the educators are confident that they know enough about environmental education and how to teach it, the study showed that there are some limitations to their actual knowledge and teaching skills. Improved resources, additional training, and departmental and external support through environmental education centres can all play a role in improving educators' abilities to enable environmental education in Namibia's Geography curriculum.

From this research, it seems that educators should:

- Use more opportunities for the creative involvement of learners, other educators and stakeholders in practical school and community activities in order to improve the quality of environmental education in Geography;
- Focus more on the development of a variety of teaching/learning strategies, and the adaptation of learning support materials to meet the diverse needs of individual learners in classrooms;
- Engage more in curriculum-planning approaches that allow the school to take ownership of and expand on national requirements, as well as promoting the subject to parents and learners;
- Reflect more on one another's experiences, sharing professional expertise, resources and strategies, and updating their own knowledge and skills on the subject at all levels;
- Apply continuous assessment and understand the need for a paradigm shift in assessment, with more emphasis on the use of a criterion reference system for learners' projects; and
- Contribute via national or local associations and meetings to discuss the role of Geography in environmental education.

### *Notes on the Contributors*

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