

South Africa's Implementation of Ecocentric Educational and Policy Goals in Relation to the Environment and Natural Resources

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Abstract

Purpose: The purpose of this study was to investigate the effectiveness of the ecocentric goal of education and policies on sustainable environmental protection in South Africa.

Methodology: The study design was a mixture of descriptive and philosophical approaches. Purposive sampling was used to select the documents analyzed and officials interviewed, while the citizens were snowballed.

Findings: The study found out that the implementation of the ecocentric goal of education and policies has been ineffective.

Conclusion: The study concluded that awareness, values, attitudes, skills, on sustainable environmental protection should be supported by prior knowledge.

Recommendation: The study recommend application of alternative strategies to supplement the ecocentric goal of education and policies towards sustainable environmental protection in light of environmental citizenship.

Keywords: *Environmental performance, ecocentric goals, policy goals*

1.0 INTRODUCTION

The environment plays a very vital role in human lives, both physically and mentally. Living in a polluted area does cause many health concerns that can easily harm and reduce human lives. Damage to the environment does not only cause obstacles to sustainable economic development but also poses great threats to human health and life, ecological systems and the natural world. A polluted environment also affects the sociocultural environments in which human beings live (Lu, 2011). Generally, with the remarkable expansion in sphere and scale of human activities triggered by globalization, global environmental problems such as climate change and the loss of biological diversity have been considered as a threat to the earth and mankind (Akintunde, 2017).

Concerns about environmental degradation and sustainable development have grown steadily over the last few decades, especially as economic growth becomes increasingly dependent on the exploitation of natural/biological resources. The main characteristics of such environmental degradation include overexploitation, industrial pollution, deforestation, soil erosion, desertification, loss of biodiversity, water scarcity and degraded water quality, poaching, and domestic and industrial pollution (Failler et al., 2016). It is thus a human duty to keep our environment clean, free from dirt and avoid things that can cause it to become polluted. Taking care of the planet Earth is a responsibility and should be an honour for all human beings. It thus, called for both public and institutional leadership that was conscious of and exemplary in both commitment and participation in environmental sustainability.

Global warming, being one of the biggest threats human face, is unfortunately getting intensified with time. The more humans pollute the environment, the more intense global warming will be. Hence, the future of the earth is in human hands (Goldier, 2009). During the Millennium Summit held at the UN headquarters in New York in 2000, world leaders committed their nations to what was called a new global partnership. This commitment was meant to reduce extreme poverty and set out a series of time-bound targets: *the UN Millennium Declaration on MDGs*. The set MDGs had eight objectives that outlined the efforts that should be put in place in order to reduce or completely eradicate the pangs of extreme poverty by the year 2015 (UNDP, 2000). The seventh MDGs' goal was on environmental sustainability that integrated the principles of sustainable development with countries' policies and programmes. This was intended to protect the loss of environmental resources (FAO, UNEP, WHO, UNICEP, 2000).

In yet another United Nations Conference on sustainable development of June 2012, commonly referred to as the RIO + 20 in Brazil, UNDP's Report to the Secretary General on *Realizing the Future We Want for All*, recommended that "new goals should be built on the strengths of the MDGs, apply to all countries, and be based on the fundamental principles of human rights, equality and sustainability" (UNDP, 2020). This Rio + 20 Conference aimed at reconciling the economic and environmental goals of the global community. The conference had three goals, namely, securing renewed political commitment for sustainable development, assessing the progress and the implementation gaps in meeting previous commitments and addressing new and emerging challenges (UNDP, 2020). In September 2015, leaders from 193 countries of the world met at the United Nations' headquarters, New York, for its 17th anniversary. They decided and committed themselves to new global goals, that is, sustainable development goals (SDGs). These SDGs are seventeen-fold associated with 169 targets. The SDGs were to build on the MDGs and complete what they did not achieve (UNESCO, 2015).

The goals and targets were to stimulate action till 2030 in areas of critical importance for humanity and the planet Earth. These critical areas included the people, planet, prosperity, peace and partnerships. In respect to the planet Earth, nations of the world were determined to protect her from degradation through sustainable consumption and production, sustainably managing her natural resources and taking urgent action on climate change, so that she can support the needs of the present and future generations (United Nations, 2011). To this end therefore, the need to protect the environment for sustainable development had increasingly been recognized, (Lu, 2011). Consequently, countries, including South Africa, adopted an ecocentric goal of education and policies as guidelines towards sustainable environmental protection.

Aldo Leopold (1949) in his *The Land Ethic* used the term “eco centrism” in ecological philosophy to denote a nature-centred, in contrast to human-centred (Anthropocentrism) set of values. Eco centrism is an ethical claim for an equality of intrinsic value across human and non-human nature, technically referred to as „bio spherical egalitarianism“, (Steele, 2011; Henning, 2016). It advocates for environmental ethics reflected in intergenerational justice, which is justice between present and future generations. This concern grows from the possibility that the fate of future human generations is uncertain due to the present growth and consumption patterns (Kopnina, 2014).

1.1 Statement of the Problem

Despite having an ecocentric goal of education and policy frameworks on environmental protection and sustainability, South Africans continued to witness incessant environmental degradation. The process and practice of education and the implementation of environmental policies was expected to have developed skills, values and attitudes among South Africans that should result in individual and collective awareness, commitment and participatory actions for sustainable environmental protection in South Africa. Contrary to the anticipated result, incessant degradation persists. Thus, this study investigated the effectiveness of the implementation of the ecocentric goal of education and policies on sustainable environmental protection, in order to identify the underlying factors for the phenomenon of environmental degradation in South Africa. It was undertaken with a view of postulating alternative measures thought to be more effective in attaining sustainable environmental protection. These, among other considerations, would inculcate a sense of environmental ethics and cognitive orientations necessary for the development of environmentally responsible South African citizens.

1.2 General Objective

The purpose of this study was therefore to investigate the effectiveness of the ecocentric goal of education and policies in relation to sustainable environmental protection in South Africa.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Development of Environmental Citizenship Theory

Environmentalism as a concern for environmental degradation and the need for sustainable environmental protection began in Europe in the 1800s. At its onset, it was a response to the effects of the industrial revolution which had ushered in both air and water pollution. The environmental movement (Environmentalism) and its calls for environmental sustainability led to the formation of what is currently called Earth’s Day, following the first UN Environmental Conference in the 1970s and The Green Medium. These were concerted concerns of the Green

Movement with a clear message that “the environment’s capacity to support human and other forms of life were being supervened, and that if nothing was done, there would be imminent environmental collapse perhaps within 100 years would be inevitable”, (Wiley & Sons, 2007).

2.1.2 The Proponents of Environmental Citizenship Theory

In shaping the Environmental Citizenship Model and its tenets, Hungerford and Volt identified three variables that influence a person’s sustainable relationship with the environment, categorized as follows: First, the general sensitivity to and knowledge of environmental issues. Second, in-depth knowledge of, personal commitment and resolute to sustainable protection of the environment. Finally, the possession of action skills and intention to act towards sustainable environmental protection (Akintunde, 2017). While appreciating that the ultimate aim of education is to shape human behaviour, United Nations (1990) World Conference on *Education for Meeting All Basic Learning Needs*, emphasized that societies throughout the world should establish education systems that develop citizens who behave in desirable ways. In the conference, Hungerford et al. (1990) presented a paper that questioned the effectiveness of environmental education in matters of enhancing responsible citizenship behaviour, observing that there are too few environmental education programmes that incorporate serious efforts to develop ownership and empowerment quality in learners.

2.1.3 Tenets of Environmental Citizenship Theory

Environmental Citizenship theory is a model about responsible pro-environmental behaviour of citizens who are expected to act and participate in society as agents of change in the private and public sphere, on local, national and global scale, through individual and collective actions, in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability as well as developing healthy human relationship with nature. In this theoretical consideration, citizens are driven by a belief in fairness of distribution of environmental goods and participation in sustainability, (Smederevac-Lalic et al., 2020).

Environmental Citizenship includes the exercise of environmental rights and duties, as well as the identification of the underlying structural causes of environmental degradation and environmental problems, the development of the willingness and the competences for critical and active engagement and civic participation to address those structural causes, acting individually and collectively within democratic means, and taking into account inter-and intra-generational justice, (European Network for Environmental Citizenship, 2018).

2.2 Empirical Review

Funke (2017) in his discussion on “*How much Knowledge is Necessary for Action?*” observed knowledge (basically constituting awareness of and consciousness about a human phenomenon) as not only a prerequisite for human action but also a consequence of action. In this context, action is a goal-directed human action in which awareness and consciousness is a means-end connection. This current study sought to establish South Africans’ awareness of the nature and existence of the education for sustainable development policy and its objectives. Oyero et al. (2018) on their study titled, “*Strategic Communication for Climate Change Awareness and Behavioural Change in Ota Local Government of Ogun State*”, investigated the practices surrounding climate change and its awareness in Ado Odo/Ota Local Government of Ogun State in Nigeria. Their study design included survey research method, non-participant observations and unstructured in-depth interviews. That study underscored the use of multi-sectoral communication strategies for human handling of environmental processes. To them,

multi-sectoral communication plays a crucial role and is a factor in winning the war against climate change and its attendant problems of greenhouse pollution, global warming and destruction of lives and properties. Their study findings showed the behaviours surrounding climate change in the study location included burning of waste and bushes, indiscriminate disposal of waste, the use of kerosene, firewood and coal for domestic purposes. They recommended a multi-sectoral communication strategy (MCS) and the use of television for effective climate change awareness campaign for behaviour modification. While appreciating the role that multi-sectoral communication strategies would play in creating awareness of the existence and objectives of the ecocentric goal of education and policies on sustainable environmental protection, this study sought to account for citizenry the awareness of the said goal and policies in South Africa. Unlike the unstructured interview used by Oyero et al (2018), this study used structured interview schedules because of the specificity of the study objective.

Ngota (2019), in his study on *The Role of Education for Sustainable Development in Enhancing Sustainability Awareness among Learners in Secondary Schools in Cape Town County, South Africa*, underscored the role of schools in helping learners to understand the impact they have on Earth. His study sought to establish the effectiveness of ESD in enhancing awareness of environmental sustainability among school learners in Cape Town, South Africa. According to Ngota (2019), schools can promote good practices and serve as centers through which young people and even local communities learn to appreciate sustainable living and working. He observed that the ESD done in schools did not translate to knowledge to be utilized in sustainable environmental protection by the learners. He sighted lack of funds and busy school schedules as reasons for ineffectiveness of ESD in schools. He recommended a change in curriculum design, designing programmes that involve both students and local community, and creation of awareness on income generating activities.

In Ngota's (2019) study, students were the target population. This study widened the scope by obtaining the views of institutional officers and citizens as they interacted with the environment. They would also relate with their formal and non-formal experiences in as far as these experiences created or did not create citizenry environmental awareness through the implementation of the ecocentric goal of education and the related policies. This study also sought to determine other underlying factors for citizenry involvement in environmental degradation and alternative measures to ensure sustainable environmental protection in South Africa.

Filho et al. (2018), in their study titled "*The Role of Transformation in Learning and Education for Sustainability*" in seven countries: Brazil, Serbia, Latvia, South Africa, Spain, Syria, United Kingdom, noted that a people's behaviour is a reflection of their values, beliefs, attitudes and skills they acquire in their schooling or training. They acknowledged paucity of studies which examine the extent to which transformation and learning on matters related to sustainable development. Their findings revealed that the concept of education for sustainable development has not been sufficiently integrated into the concept of transformation in higher education institutions. They also found that to enhance sustainability in the curricula, academics should develop collaborative approaches, and discuss how to redesign their own disciplines, and how to appreciate the epistemology and multicultural vision of sustainability, both as a topic, and as a field of education research. To them, reflections of the academics on their own values are crucial for developing the transformative potential of students as agents of a sustainable future (Filho et al., 2018).

3.0 METHODOLOGY

The study design was a mixture of descriptive and philosophical approaches. Secondary data were from institutional reports (document analysis) while primary data were from descriptive interview sessions with the officers and citizens. Purposive sampling was used to select the documents analyzed and officials interviewed, while the citizens were snowballed. A sample size of 119 respondents was used. Conceptual and phenomenological analyses were used to interrogate the descriptive experiences of the respondents and institutional reports, interpret implications and recommendations.

4.0 DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Demographic Characteristics

Out of a sampled population of 119 respondents, the study interviewed 82 respondents, giving a response rate of 68.9 % which is within what Thornhill (2012) prescribed as a significant response rate for statistical analysis established at a minimal value of 50%. All the institutional officers had over 16 years of formal education and 63% of them with more than 5 years of institutional engagement to ensure sustainable environmental protection. 86.7% of the representative respondents had attained post-primary education. This implied that the respondents had sufficient opportunity during formal schooling to acquire prerequisite knowledge about environmental issues.

4.2 Descriptive Analysis

4.2.1 Ecocentric Goal of Education

The ecocentric goal of education objectifies citizenry commitment and participation for a clean and healthy environment. Learners' and citizenry awareness of the ecocentric goal of education is exhibited through acquisition and execution of environmental ethics. As a result, citizens develop: through formal and non-formal educational practices; beliefs, values, and skills that enable commitment and participation in sustainable environmental protection. They would, therefore not engage in activities that are detrimental to their mental and physical health and the environment in general. Ngota (2019) expressed that formal education practices did not include awareness of the existence and nature of the ecocentric goal of education on sustainable environmental protection. It was however noted that he was aware of other goals of education like national cohesion and international consciousness. Schools and schooling experiences are expected to enable acquisition of knowledge and create awareness among learners and subsequent citizens that would help them to appreciate the intrinsic value of the physical environment and manage it for their survival. Ngota (2019) underscored the role of education theory and practices of schooling as that of helping learners to be aware of environmental issues and the impact of human actions on the Earth. As per Ngota (2019), schools are expected to facilitate development of effective environmental ethics (attitudes, values and skills) among learners through corresponding practices, and even act as Centers where young people and the larger community can learn to appreciate sustainable environmental protection.

4.2.2 ESD and Natural Environment Policies

The ESD policy is a holistic and transformational policy on education that addresses learning content and learning outcomes, pedagogy and the learning environment to achieve societal transformation. To this end, learning content involves integrating critical issues like climate change, poverty reduction, gender equality, biodiversity, disaster risk reduction and sustainable consumption and production. Learning outcomes includes promotion of core competences like critical and systematic thinking, collaborative decision-making, and being responsible for

present and future generations. Pedagogy and learning environments involves designing teaching and learning in an interactive learner centred manner that enables exploratory, action-oriented and transformative learning. Learning environments that includes physical, virtual and online platforms are reorganized to inspire learners to act for sustainability (MoE, 2017). The situation envisioned in ESD is realized when knowledge, skills, attitudes and values are developed in learners in order to secure a just, peaceful, tolerant, inclusive and resilient societies. Such results to and can only be possible in a clean and healthy environment; the focus of the ecocentric goal of education.

On the other hand, the natural environment policy was a response to sessional paper no. 6 of 1999 titled Environment and Development which led to Environmental Management and Coordination Act (EMCA) no. 8 of 1999 and the „green“ constitution of 2010. It was adopted in 2003 with the main goal being “better quality of life for present and future generations through sustainable management and use of the environment and natural resources”. Formal and non-formal educational practices were expected to enable citizenry awareness of the need for and participation in sustainable environmental protection as a reflection of the natural environment policy and its objectives. As the basis for environmental citizenship, awareness on the phenomenon of environmental issues and consequences of human actions on environment are necessary for a commitment to act responsibly and sustainably on environmental protection. As observed by Funke (2017), the awareness enables conscious and sustainable interaction with the environment. For the citizens, the awareness of environmental issues, the phenomenon of environmental degradation and the commitment to act responsibly and sustainably on environmental protection would only be possible through formal or non-formal educational practices. Apart from school practices, public stakeholder engagements are the only opportunities for creating citizenry awareness on environmental issues and need for human commitment to act and relate sustainably with the environment. In establishing institutional officers” and citizenry awareness of the existence, nature and purpose of policies on sustainable environmental protection.

4.2.3 A Reflection on the Level of Awareness of the Ecocentric Goal of Education and Policies on Sustainable Environmental Protection

There are classical and modern philosophical debates on the concept of human awareness. Both the platonic and Aristotelian traditions admit the self-awareness or consciousness where the human mind gains knowledge of oneself: awareness that one exists or awareness of one’s essence (Smith, 2017). Dretske (1999) in his “The Mind’s Awareness of Itself” expressed the notion that one cannot be conscious of one’s internal affairs {one’s experiences} without being aware of these experiences themselves or the properties that give them their phenomenal character. Dretske’s conceptualization of awareness brings out three forms of awareness: object awareness, fact-awareness and property-awareness, (page 106). Without describing the distinction between these “awareness”, Dretske advocates for an awareness that involves a consciousness of things and experiences by human beings. By such, human beings become conscious and or aware of themselves and their surroundings, as advanced by Hashim and Ramadhan (2019) in their “*The Need for Developing a Fourth Level of Awareness in Human Consciousness: Unconsciousness, Pre Consciousness, Consciousness and Post Consciousness.*” Essentially, in the light of the above debates and many others, human awareness involves one’s consciousness of both their individual and collective “essences”. This is in terms of their necessary placement within, their participation and contributions to the wellbeing of their various environments.

Since human beings exist within their physical environment, their experiences within this environment, that is, the human-nature interrelationship, requires their awareness of constitute environmental issues and their contribution towards environmental sustainability. The phenomenon of environmental degradation and the need for sustainable environmental protection were realities that both institutional officers and citizens needed be aware of. The human response to these realities required citizenry character formation and training of respective rules of conduct. Thus, education, in its theory and practice, should have enabled development of such character and acquisition of rules of conduct that constitute environmental ethics. These character and the rules of conduct are the bedrock for environmental citizenship (Cohen, 1999). These rules and ethics constitute the beliefs, values, attitudes and skills that are embedded on the knowledge that human beings should acquire in order to act in respect to sustainable environmental protection as observed by Funke (2017). To enable this, the theory and practice of education (in its forms: formal, informal and non-formal) should expectedly have reflected the presuppositions of the ecocentric goal and policies on sustainable environmental protection.

With 80% of the citizenry respondents having been involved in environmentally degrading activities for over five years, the adverse impact on the physical environment is phenomenal, just as observed in chapter two. Again, with over 83.3% of the representative ordinary citizens being youth, any suggested alternative measure to inculcate environmental citizenship among South African citizens that targets the youth would impact a greater composition of the general population.

4.2.4 The Effectiveness of the Ecocentric Goal of Education and Policies on Sustainable Environmental Protection in South Africa

As observed by Pradhan et al. (2017), the effectiveness of policies is measured by short term, immediate and tangible benefits rather than long-term adaptation strategies. Also, in the UNEP (2019) Report on “Measuring Progress: Towards Achieving the Environmental Dimension of the SDGs” it was observed that policy-making in the African region is neither well informed by adequate data and the effectiveness of policies is not adequately monitored. The report underscored the need to provide an assessment of the effectiveness of the policy measures, especially those touching on the physical environment. In chapter two, it was noted that both the goal and policies thereof were put in place to create awareness on the benefits of and the need for citizenry commitment and participation in ensuring a clean and healthy environment, through its sustainable protection. It was in this light that this study’s second objective was to assess the effectiveness of the ecocentric goal of education and policies on sustainable environmental protection. The researcher sought respondents’ lived experiences and institutional reports in response to the second research question. These responses, which formed the scorecard for the required assessment, are summarized in table 1.

Table 1: Summary of respondents' scorecard on prevailing environmental degradation in the sampled 8 counties in South Africa (By both Institutional Officers and Citizens)

Region	Degradation activities observed in the region
Cape Town	1. Blocked drainage/sewage lines: the lines are inadequate, poorly constructed with illegally/irresponsibly dumped solid wastes, hence stench & flooding, 2. Air Pollution, CFCs from industrial emissions (Oil & Manufacturing industries, Cement manufacturing, cigarette production, incinerators, ferrous and non-ferrous metal recycling facilities; thermal power plants, sugar Factories, galvanized steel production and agricultural products processing e.g. flour, are some of the major emission sources), Non-road worth vehicle petroleum emissions, 3. Undesignated waste dumping sites with public burning of solid waste, Washing of vehicles on rivers and dams, 4. Development/Construction on riparian land and Game reserves; frequent flooding, disruption of animal corridors and migration and disturbance of natural habitats for wildlife.
Pretoria	1. Water Pollution: plastics, untreated/effluent industrial and solid wastes emptied into the rivers, Washing of vehicles on the rivers 2. Air Pollution; CFCs from industries (Oil & Manufacturing industries: Cement manufacturing, cigarette production, incinerators, ferrous and non-ferrous metal recycling facilities, thermal power plants, galvanized steel production and agricultural products processing e.g. flour, are some of the major emission sources), Nonroad worth vehicle petroleum emissions, public waste burning. 3. Undesignated waste dumping sites with stench 4. Development/Construction on riparian land, frequent flooding and disruption of natural habitats for wildlife.
Johannesburg	1. Deforestation: for subsistence farming, firewood and timber 2. Charcoal burning 3. Unprecedented sand harvesting 4. Air Pollution; public burning of solid waste, undesignated dumping sites with stench, Non-road worth vehicle petroleum emissions, 5. Development/Construction on riparian land; frequent flooding 6. Encroachment; farming and settlement on Rivers.
Durban	1. Deforestation for subsistence farming, firewood and timber 2. Charcoal burning 3. Water Pollution 4. Air Pollution; CFCs from industrial emissions, incinerators, metal recycling facilities; thermal power plants, sugar factories, galvanized steel production and agricultural products processing Non-road worth vehicle petroleum emissions, undesignated waste dumping sites with stench, public burning of solid waste. 5. Construction on riparian land, washing of vehicles on rivers and dams.

Polokwane	1. Deforestation 2. Encroachment 3. Air Pollution; public burning of solid waste, undesigned dumping sites with stench, Non-road worth vehicle petroleum emissions 4. Development/Construction on riparian land; frequent flooding, disruption of animal corridors and migration, disturbance of natural habitats for wildlife
East London	Water Pollution; Solid and liquid wastes, Prevalence of plastics, Petroleum spillages from petrol stations Air Pollution; public burning of solid waste, undesigned dumping sites with stench, Non-road worth vehicle petroleum emissions, Non-rehabilitation of quarrying and mining sites
General judgment on the effectiveness	The Implementation of the Ecocentric goal of education and policies on sustainable environment protection in South Africa has not effective

4.2.4.1 Effectiveness of the Ecocentric Goal of Education

The main goal of an education system is to foster competencies. Competency is the ability to perform the activities within an occupation. It is exhibited by a unique characteristic of effective and creative demonstration and deployment of knowledge, values, attitudes and skills in human situations. It is the capacity to transfer specified knowledge into practice, (Kennedy et al, 2009). In addition, it is imperative to note that “citizens are not born, they are made”. As such, education develops citizens who “take responsibility for their actions in a series of everyday situations involving various kinds of moral and ethical issues”, (Dahlstedt et al., 2011). Responding to change is the main responsibility of education where the practice of education advances citizenry understanding of multifaceted issues and develop their ability to respond to them effectively, (UNESCO World Conference on Higher Education, 2009). Hence, in the interest of this study, learning and training should deliver skilled, creative, adaptive citizens who are ethically motivated and globally oriented to respond to emerging environmental issues (Nikolic & Gledic, 2013).

Thus, the practice of education, as guided by ecocentric goal, was to make South African citizens responsive to the environment. Consequently, they would execute knowledge, values, attitudes and skills for its sustainable protection. Moreover, with increased access to education in South Africa (Nicolei, 2014), South African citizens were to demonstrate competencies in environmental ethics that effectively govern human-nature interrelationship. The citizens’ ecological knowledge, values, attitudes and skills were to elicit an ability to respond to the phenomenon of incessant environmental degradation and the call for sustainable environmental protection. Therefore, the effectiveness of the ecocentric goal of education in South Africa was assessed by observing and seeking responses on the institutional officers’ and citizens’ ability to demonstrate and deploy their knowledge, values, attitudes and skills on sustainable environmental protection.

4.2.5 Observed Practices on Sustainable Environmental Protection

As presented in the background of this study, data that highlighted the state of environmental sustainability in the world is displayed from records of EPI. EPI uses 32 performance indicators with 11 categories of issues to rank 180 countries against their environmental health and

ecosystem vitality. The index shows how countries' performance is rated based on how close they are to internationally established environmental policy targets. As a scorecard, the index shows the leaders and laggards in environmental sustainability thus providing practical indicators for countries as they move towards sustainable future. South Africa in this rating was ranked positions 130 and 132 in 2018 and 2019 respectively (Wendling et al., 2020). This ranking therefore, made it necessary for one to observe the comparable global practices on sustainable environmental protection.

In the above mentioned ranking, Switzerland was in position 1 and 3 in EPI ranking of 2018 and 2019 respectively. This was due to her implementation of environmental protection policy measures with good measure of success. What is worthy noticing is that Switzerland's prescriptive environmental policy's enactment is usually preceded by lengthy and intensive consultations between the different authorities and economic actors. Such arrangement facilitated ease of implementation and observance with a highly developed public involvement. Her citizens intervened in the preparation of legislation, propose subjects for referendums and vote directly on major policy issues. As far back as 1998, public expenditure on environmental protection in Switzerland was equivalent to about 1.7 per cent of GDP which was high compared with other OECD countries at that time. This percentage had more or less remained over the years. The Confederation, cantons and municipalities in Switzerland finance roughly one-third of this expenditure as businesses and households bore roughly two-thirds of the expenditure (Schuknecht & Tanzi, 2005; Moreno-Enguix & Bayona, 2017; Stiftung, 2018). Regulatory approach, substantial government funding and an actively involved public environmental awareness were fundamental to these policy and public interventions. Consequently, remarkable results to pollution abatement were achieved. From 1990s, environmental policies had focused on the prevention of damage to the environment. The Federal Council considered the requirements of sustainable development in all sectorial policies, notably those affecting energy, transport and agriculture, (Moreno-Enguix et al., 2017).

Switzerland took measures very early on to prevent and control water pollution, notably from industrial and urban sources. There had been considerable investment in waste water infrastructure (over SF 40 billion in the past 30 years {by 1998}), partly financed by federal and cantonal subsidies. As a result, many watercourses were of good physical chemical quality (content of organic contaminants, heavy metals and micro-pollutants). With the ban on phosphates in detergents, and phosphate removal at many treatment plants, phosphate loads from these sources decreased very significantly, (Schuknecht & Tanzi, 2005).

The level of selective collection of municipal waste for purposes of recovery and recycling was one of the highest among OECD countries; the recycling was done essentially by the private sector and financed chiefly by an advance disposal charge. Incineration capacities for special waste were sufficient to meet the country's needs; exports of special waste for incineration or open landfilling are prohibited. Over the years Switzerland developed the legislative and regulatory framework, institutions and infrastructure needed to ensure efficient waste management. Expenditure in this area amounted to 0.6 per cent of GDP. Collection of unsorted municipal waste was available to almost the entire population. Over 80% of this waste was incinerated in appropriate facilities (Moreno-Enguix et al., 2017; Metz & Glaus, 2019).

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

From the study, it has been found that the institutional officers are not aware of the ecocentric goal of education and are also unaware of the specific objectives of the policies on sustainable environmental protection. It was therefore logical to conclude that the theory and practice of education (formal and non-formal), at all levels of learning and training, has not been structured {both in content and delivery approaches} to enable learner/citizenry awareness on environmental issues and in respect to sustainable environmental protection. Respondents' views and observed citizenry involvement in incessant environmental degradation were indicators of ineffective implementation. The implementation strategies employed by the agents (educators, institutional officers and citizens) have not enabled acquisition, enculturation and execution of environmental ethics: values, attitudes and skills, that ensure citizenry commitment and participation in sustainable environmental protection practices. The study concluded that sustainable environmental protection would be optimized if the identified underlying factors are minimized in a well-coordinated manner, pursuant to environmental intergenerational justice.

5.2 Recommendations

To salvage the environment from citizenry destructive involvement and interrelation through acquisition and execution of environmental citizenship in South Africa, the study recommended increased institutional capacity, legal frameworks and citizenry practices that included; To amend the Science, Technology and Innovation Act, No. 28 of 2013 on the functions of NACOSTI function (d) to read “develop, in consultation with stakeholders, the priorities in scientific, technological and innovation activities in South Africa in relation to the economic, social and environmental policies of the government and the country’s international commitments”. This would be in light of concerted and legal attempts to make the natural environment part of the country’s character and identity in all aspects, including education. It would also help restricting NACOSTI’s key performance indicators to include support on sustainable environmental protection.

To make South Africa’s natural environment part of the national character and integrity, environmental education need to be made specific and be a compulsory examinable subject, at least for primary and secondary levels of education.

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Conflict of Interest

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