Education for sustainable development: Integrating indigenous knowledge in water and sanitation programmes in Shimukuni community of Chibombo district in Zambia

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Abstract

The focus of this study was to explore the integration of indigenous knowledge in water and sanitation programmes in Shimukuni community of Chibombo District in Zambia. The rationale for this study was based on thefact that most providers of community related programmes in the rural areas of Zambia have been associated with a practice of taking programmes to the community without taking into consideration the existing indigenous knowledge. This trend has often times resulted in the stagnation of development in rural areas, thereby widening the poverty divide. Shimukuni is one of the communities in Chibombo district which has continued to be confronted by the challenge of water and sanitation. This community was used for this study as a case for our understanding of how development programmes implemented in several other rural communities in Zambia tend to ignore the available indigenous knowledge which is beneficial to the sustainability of the intended development. Further, this community was used to help us come up with the understanding of how indigenous knowledge could be meaningfully integrated in water and sanitation programmes in rural Zambia.

Key words: Indigenous knowledge, indigenous knowledge systems, sustainable development and sanitation.

1. Introduction

Some Western scholars havecriticized African Indigenous Knowledge System (IKS) on the basis that it lacks a theoretical framework and research methodologies embedded in the African context. However, when we consider the need to achieve sustainable development through development agendas of many countries in Africa, the relevance of Indigenous Knowledge systems in modern development cannot be discounted. It has been realised that the rich knowledge in Africa (Indigenous Knowledge Systems) has remained untapped for a long time, and yetit is the key to socio-economic transformation of Africa.

Indigenous knowledge is used in this paper to refer to the type of knowledge which is indigenous or organic to a given group of people. It is knowledge which makes a given community unique from another community i.e. practices, values, beliefs which make up their way of life (Boven&Morohashi, 2002). It has been established that IKS are a social practice embedded in the capacity and everyday life of the community. The emphasis is on local contexts, language, communication and practices which enhance effective change. Similarly sustainable development is understood to be a process of meeting the needs of the current generation without compromising the ability of the environment to meet the needs of the future generation (Indabawa&Mpofu, 2006). Thus"Education for Sustainable Development (ESD) is based on the understanding that education should equip the learners with the knowledge and understanding, skills and attributes needed to work and live in a way that protects the environment, social and economic well-being, both in present and future generations'' (Longhurst, 2014:5)

Current global efforts on sustainable development on Water and Sanitation tend to side-line indigenous people and their respective knowledge of water issues. For instance, the Millennium Development Goals (MDGs), and the World Water Forums are evidence of the absence of indigenous people and their knowledge. Nakashima and Chiba cited in UNESCO (2006) record that, the report from the session on Water and Indigenous people during the Second World Water Forum held in The Hague in 2000, concluded that:

> *''…It is clear that indigenous / tribal peoples,their unique system of values, knowledge andpractices have been overlooked in the world water vision and process…in this regard there is an urgent needto correct the imbalance of mainstream-thinkingby actively integrating indigenous women andmen in the subsequent phases starting with theframework for action*" (p. 12).

This global practice has trickled-down to continental and country level of several countries in Africa and Zambia in particular. Zambia is a landlocked country surrounded by eight neighbouring countries: Malawi, Tanzania, Mozambique, Zimbabwe, Namibia, Angola, Botswana and Congo DRC. The country is endowed with 66% of water resources in Southern Africa, and yet its population has continued to face the challenge of lack of access to water and sanitation (CSO, 2010). In 2011, the Zambian Government in its Sixth National Development Plan (SNDP) acknowledged that all sectors of the Zambian economy among them, agriculture, mining, industry, energy and housing require access to adequate water and sanitation for their development (Republic of Zambia, 2011). The vision of the country in this sector was to have a Zambia where citizens have access to water and sanitation and utilize them in an efficient and sustainable manner for wealth creation and improved livelihood by

2030. Implicit in this vision was the goal to achieve 75 percent accessibility to reliable safe water and 60 percent adequate sanitation.

Achieving access to adequate water and sanitation was projected to be realised by the year 2015. However, it was realised that this goal was going to be achieved and the government had to revise theSixth National Development Plan to cover the period 2013 – 2016. Between 2011 and 2012 government had constructed a number of dams and boreholes to improve the water situation in the country (Republic of Zambia, 2014). Nonetheless, the efforts made were insignificant to the proportion of rural people who lacked access to water for production and domestic use. In Central province, 36.8 % of the population had no access to safe water sources. Often times human beings found themselves in conflict with animals in accessing water. Part of the possible challenge contributing to the water and sanitation challenge among many rural Zambians, is the situation created by the powers that be, of making people depend on the central government for the provision of almost all the services including water and sanitation. When one examines the water and sanitation sector as documented in the Sixth National Development Plan, local initiative is totally ignored.

This study took place in Shimukuni community found in Keembe ward of Chibombo District of Central Province of Zambia. The community comprises individuals with high levels of formal illiteracy. However, the local people engage in daily literacies interwoven in the indigenous knowledge of the people.

Shimukuni community has a fairly good gravel road of about 26 kilometres from the Great North Road. The area is also supplied with electricity from the national grid. The main economic activity of Shimukuni community is small scale agriculture and petty trading. The people are involved in crop production and animal husbandry. The community has limited water sources which include, seasonal streams, shallow wells, boreholes and collected rain water.Due to limited water sources, the community of Shimukuni has often times found itself in water conflicts among themselves as well as with animals. Whenever there are such challenges, interventions have been made by either outside development agencies such as NGOs or the government. An evaluation of these interventions seem to indicate that sustainable solutions to the water and sanitation in this community are still a challenge.

1.1 Statement of the problem

With the increasing emphasis on the need for the integration of indigenous knowledge in national development agendas, Zambia seems to be behind. There has been inadequate research on the subject of Indigenous Knowledge System (IKS)in the country and yet most development projects have continued to be taken to various rural communities with little or no regard for the available indigenous knowledge in those communities. Even in cases where effort has been made to integrate indigenous knowledge in rural development projects, the extent to which indigenous knowledge has been meaningfully integrated in such projects in Zambia has not been established. In other words,it is not known what elementsor aspects of indigenous knowledge could be integrated, how it could be done and the possible long term benefits to the community.

1.2 Research Objectives

The research objectives were to:

a. identify the available indigenous knowledge systems
b. investigate the possible long term benefits of indigenous knowledge system in water and sanitation
c. explorethe extent to which indigenous knowledge systems have been meaningfully integrated in water and sanitation programmes.

1.3 Rationale

This study was motivated by the fact that water and sanitation are a basic human necessity. A person can be denied many things, but one cannot do without water and sanitation. Shimukuni is one of the rural communitiesin the country experiencing water and sanitation challenges. Despite the presence of NGOs and other development agents implementing projects in water and sanitation is this community with a recognition of the available indigenous knowledge systems (World Vision, 2010), the challenge has continued. It was in view of the foregoing that the researchers set out to investigate the extent to which indigenous knowledge systems have been meaningfully integrated in water and sanitation project in Shimukuni community.

1.4 Conceptual and theoretical framework

Several studies on indigenous knowledge systems have investigated the use of IKS in many development enterprises such as environmental management, wildlife conservation, and integrated water resource management (Longhurst, 2014&Mckeown, 2002). The review of literature revealed thatthere is still a dearth of information on the available IKS on water and sanitation in Zambia whilethe little available information remain undocumented. Thinking within the constructivist research paradigm, the researchers wanted to understand how IKS could be meaningfully integrated in water and sanitation programmes. It was envisaged that, the incorporation of IKS in water and sanitation programmes would bring about sustainable development in the management of water and sanitation in Shimukuni community. The researchers' argument is that IKS are embedded in the social practice of society and they can only be identified and understood from the perspective of the socio-cultural context of the local people. The integration of IKS in a programme means that the local community brings about enhanced learning and sustainability due to the fact that the learners are able to relate what they are learning with their everyday experiences.This study was informed by two theories; Sen's Capability theory and Self-directed Learning theory.

Sen's capability theory is based on the moral explanation of the need to evaluate social arrangements according to the extent of the freedom people have to achieve functioning's/ something of value (Alkire, 2001). Taking sustainable development as the primary focus of modern development, this theory asserts that people have the moral capability to achieve the desired or valued sustainable development.This theory is strongly anchored on the connection between capabilities and functioning's.The term "Capability" is used to refer to the things a person is able to do. The primary focus is on the freedom a person has to do those things. Whereas functioning's refer to various things a person may value.

According to Ngaka, Openjuru and Mazur (2012), Sen's Capability theory identifies the capability of individualsto transform their environments for the better and benefit of the current and future generation. Globally, it is becoming clear that a number of people are

becoming aware of the relevance oflooking after the environment (UNEP, 2006). The value to protect the environment is one of the various elements of the capability theory. In this regard indigenous knowledge becomes a very important element and valued for its relevance and subsequent integration in sustainable development programmes. From the adult education perspective, this theory fits in very well in this study. Adult education operates on the principle that adults have vast experience, capability to solve their own problems and often times learn through self-directed learning (Fasokun, Katahoire&Oduran, 2005).

Linked to Sen's Capability theory is Self-directed Learning theory.This theory is based on the everyday life experiences of the people. It is described as a learning process in which individuals' take their initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes (Knowles, 1975). What it means is that adults have specific things they value and would like to achieve in life. Using self-directed learning they develop the capacity to diagnose their own learning needs.

In line with this study, the theory identifies the need for the use of all available knowledge sources including indigenous knowledge in all learning. According to this theory, sustainable development may not only be attained by focusing on a selected set of knowledge, but the incorporation of various sets of knowledge produced and acquired through different modes. Self-directed learning in this sense will be contributing to sustainable development particularly when the targeted community has been recognised based on their capability to initiate learning and development programmes based on their local environments, understanding and indigenous knowledge systems.Figure 1 below is a diagrammatic representation of the theoretical conceptualisation of Sen's Capability theory and self-directed learning.

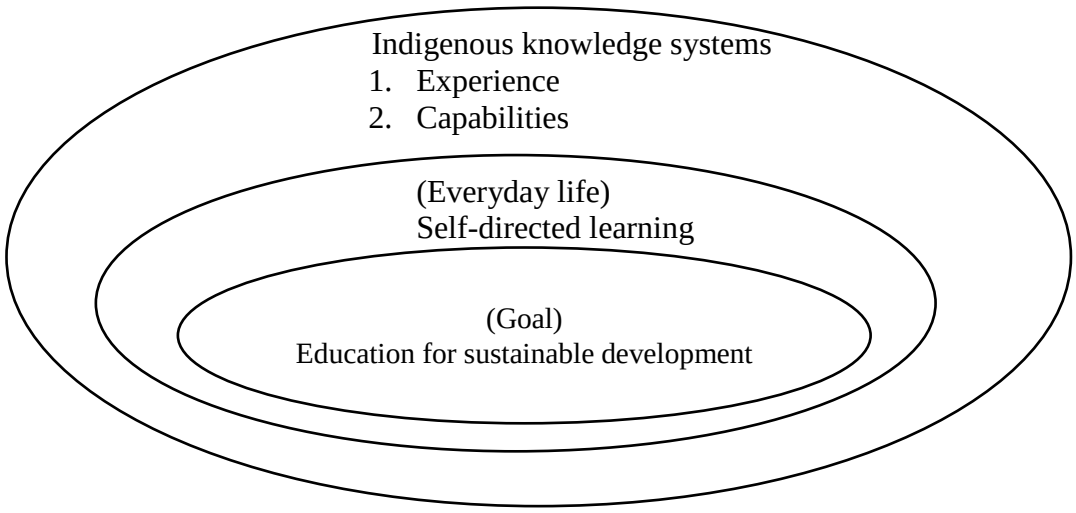

Fig: 1

2. Literature review

2.1 Indigenous knowledge systems (IKS)

IKS refer to knowledge embedded in the practices of local communities. This knowledge can be specific to an ethnic group and it is unique to a given culture or society (Easton, 2004 in The World Bank, 2004). In many local communities in Zambia, indigenous knowledge is actually a basis for local-level decision-making in ruralcommunity activities. This means that the information base of society is grounded in indigenous knowledge systems which is a conduit for communication and decision making. Indigenous knowledge systems are dynamic and are continually influenced by internal creativity and experimentation as well as by contact with external systems. According to Easton (2004), IK is the knowledge that people in a given community have developed overtime, and continue to develop. It is based on experience, often tested over centuries to use, adapted to local culture and the environment and are dynamic. IK is related to a common practice seen in communities that are indigenous to a specific area. It is also important to mention that IK is embedded in culture and is unique to a given location or society and remains an important part of the lives of the poor.

In the context of water and sanitation programmes, IK is a basis for decision-making based on the fact that it is knowledge embedded in the practices of local communities. At the same time a spiralling relationship exist between IK and water and sanitation programmes in Zambia. Water is a natural resource and important for human survival and the general well-being of the human race. This means that IKS are fundamental in the effective management of water and sanitation systems. Additionally, IKS provide a foundation for sustainable development of water resource management. It is also important to underscore that most traditional societies derive their socio-cultural and spiritual identity from their local environments. In line with this thinking water is accorded a lot of respect for spiritual reasons and that water is a source of life (Steiner &Oviedo, 2004). As a matter of fact, people believe that water is equal to life. Such beliefs and values have potential to enhance sustainable development in the water and sanitation sector within a rural setting. By implication traditional beliefs and values may safeguard the natural resources such as water for fear of being cursed or disowned by the community.

2.2 Indigenous knowledge systems on water

Steiner and Oviedo (2004) conducted a study on indigenous knowledge and natural resource management. In this study it was argued that traditional societies have a lot of respect for their environments. They realised that their traditional environments were a source of diet, economy and culture. For instance, forests, plants and animals are a source of food, medicine, shelter and income. Rivers provide transportation and fish, and water and soils provide a permanent source of sustenance. This study also established that indigenous practices were based on a sense of harmony with the natural environment, which resulted in sustainable practice and sustainable use of the environment. The traditional use of natural resources was based on traditional values. For instance, the management of natural resources was strongly influenced by indigenous knowledge on spirituality attached to wildlife and natural resources. A practical example was cited from Ghana where the regulation of water access and use is based on spirituality. It is understood that local communities consider resources of the planet

as sacred and deserve utmost respect. In some places indigenous knowledge practices have influenced the establishment of institutions of sacred natural sites.

In spite of different cultural practices, water management in many indigenous societies remain embedded in the social and spiritual values. For instance, in most traditional communities in Africa, water is seen as a responsibility attended to by all members of the community. The spiritual value attached to water involves showing respect to the spirits associated with water source and continued sustenance of the availability of water in the community.

2.3 Education for Sustainable Development

Different views on the definition and meaning of Education for Sustainable Development (ESD) have continued in the academic field. However, there have been international efforts to seek consensus not on the meaning of ESD, but on the key principles based on the scope, purpose and practice of ESD (UNESCO, 2009a). In view of this, Education for Sustainable Development has been understood as a learning process based on the ideals and principles that underlie sustainability and is concerned with all levels and types of education. UNESCO(2009b:1) explains that Education for Sustainable Development (ESD) processes emphasize the need for stimulating a holistic, integrated and interdisciplinary approach to developing the knowledge and skills needed for a sustainable future as well as changes in values, behaviour, and lifestyles. The understanding is that ESD is about learning to:

a. respect, value and preserve the achievements of the past;
b. appreciate the wonders and the peoples of the Earth;
c. live in a world where all people have sufficient food for a healthy and productive life;
d. assess, care for and restore the state of our Planet;
e. create and enjoy a better, safer, more just world;
f. be caring citizens who exercise their rights and responsibilities locally, nationally and globally.

Education for Sustainable Development has continued to be a necessity in today's development discourse, because of the various critical global challenges suchas: human-induced climate change, the rapid depletionof natural resources, the frequency of natural disasters, the spread of infectious diseases, the lossof biodiversity, the violation of human rights, increasedpoverty, and the dependency of our economic systemson continuous growth in consumerism (UNESCO, 2012).

Within UNESCO's thinking, sustainable development (SD) has become a vehicleround the globe for expressing the need to depart fromthe present dominant models of development which appearunable to balance the needs of people and the planet inthe pursuit of peace and prosperity. In this framework, ESD has four main areas of emphasis: *improving access and retention in quality basic education, reorienting existing educational programmes to address sustainability, increasing public understanding and awareness of sustainability, and providing training to all sectors of the workforce* (UNESCO, 2012).

Education for Sustainable Development in Africa has continued to be demonstrated through both Non-formal and Formal education programmes. Through Non-formal education many countries have witnessed the introduction of various sustainable development programmes such as the creation of bio-centres, awareness programmes and several others. On the other hand, the formal education sector hasbeen characterised by either curriculum reforms or simply the introduction of new academic programmes focusing on sustainable development.

Some countries in Africa have introduced ESD programmes in their education systems. For instance, in Kenya, Kenyatta University developed a Masters of Science programme in sustainable urban development, which aims to produce students who are willing to work with the community-based NGOs, clubs and associations on issues of sustainable development (Otsuki, 2010).In Tanzania Education for Sustainable Development is conceptualised in the context of integrating Environmental Education in the formal education curricula at all levels-primary, secondary and tertiary. According to the National Environmental Management Council (2012) of Tanzania, the National Education Policy's special emphasis is on environmental education and public awareness in schools, tertiary and adult education institutions. This policy has paved the way to the development of an Education Sector Development programme, and subsequently a Primary Education Development programme (PEDP), which has a section emphasising environmental education and is reflected in the revised curricula. It is clear that the roots of education for sustainable development are firmly rooted in environmental education. Though environmental education is not the only discipline with a strong role to play in the reorientation process towards sustainable development, it is an important ally. Similarly in Zambia, the University of Zambia has introduced an undergraduate degree programme in Environmental Education as a way of responding to the actualisation of ESD in the national development agenda.

3. Research Methodology

This study was situated within the constructivist research paradigm. This was based on the basic assumption of this paradigm that knowledge is socially constructed by people active in the research process, and that researchers should attempt to understand the complex world from the point of view of those who have the experience of the subject been studied (Mertens, 2014). The researchers wanted to understand and interpret the integration of indigenous knowledge systems in water and sanitation programmes from the participant's social reality. In this paradigm, reality is socially constructed and it remains important to comprehend multiple mental constructions of reality within which conflict may exist and change about perceptions of reality may occur during the process of research. Qualitative methods specifically in-depth interviews and focus group discussions were used to collect data for this study. The use of these methods was guided by the social construction assumption of constructivism in that research can be conducted only through interaction between and among investigators and respondents (see: Mertens, 2014;Chilisa&Preece, 2005).

In this study, the researchers wanted to understandhow meaningfullyindigenous knowledge systems could be integrated in water and sanitation programmes. The respondents for this study includedCommunity Development Officers, water and sanitation experts from the Council and LukangaWater and Sewerage Company people of the Shimukuni community.

The data collected was analysed qualitatively through a codification process. The analysis was based on the themes which emerged from the findings.

4. Findings

4.1 Community understanding of indigenous Knowledge

The findings indicated that the community perceived indigenous knowledge as knowledge derived from the local culture of the people. It is knowledge practised by the local people in a given area and context for their own survival. They explained that it is something they possess even if some of them have never been school. They further explained that it is knowledge acquired through traditional means of socialization within one's context. It is not something which is standard as it differs from place to place, although in some instances different communities may have similarities in the way they do things. One respondent gave an example of pastoral farming which is one of the economic activities in Shimukuni community. However, this economic activity remains unsupported.

4.2 The available IKS on water and sanitation in Shimukuni community

The study established that there was more regard for water than sanitation in the community. The people of Shimukuni community regard water as an important resource which will never lose its value. And for this reason, they believed that water should be well managed. The study identified some key aspects of IKS in water and sanitation in the community namely identification of water sources and storage.

4.2.1 Water sourcing

The use of trees and grass to locate water points was one of the identified IKS available in the community. Trees such as *Acacia Albida (locally known as munga or msangu), Ficussycomorus*(*locally known as Mkuyu*) and Combretum*Collinum* were used to determine the availability of ground water. It is believed among the people that the presence of these trees in the community is a clear indication of the availability of ground water.

Alongside this knowledge, the community had a system of locating water points by using a twig from the Piliostigmathonningii tree (*locally known as Chitimbe*). This twig has branches like a catapult. To locate the water source, the trig is held on both ends of the alternating branches. Then the one locating the water source walks in a given area looking for a point with high water. Ifa particular area has high ground water, the twig will point downwards at it (area).

It was also revealed that the community relying on indigenous knowledge, uses locally made clay pots for storing water. These pots have a sizable mouth and often times covered witha lid to avoid contamination. The study found that majority of the community members uses these pots as they have a cooling effect on the water for drinking. Water is drawn out of these pots using either a cup or calabash.They also dug canals to harvest rain water which was later used for irrigation and drinking by their animals. Sometimes water from the canal is also be used for washingclothes.

4.2.2 Sanitation

Sanitation is a general term which covers inter alia; safe collection, storage, treatment, reuse, recycling and management of human excreta, solid wastes, household wastewater, and hazardous wastes from hospitals, industries and so forth (WHO, 2004). In Shimukuni community key sanitation issues evolved around the disposal of human waste. The study established that cultural values and beliefs about human waste being a source of manure for crops, contributed to poor management and little appreciation of good sanitation practices. Although toilets in the form of latrines were available in the community, they lacked maintenance and cleaning.

Wherever humans gather, their waste also accumulates. Currently, the challenge is that many people still have no adequate means of disposing of their waste. This is a growing concern in heavily populated areas as it carries the risk of infectious disease, particularly to vulnerable groups such as the very young, the elderly and people suffering from diseases that lower their resistance. Poorly controlled waste also means daily exposure to an unpleasant and unhealthy environment. The build-up of faecal contamination in rivers and other water bodies is not just a human risk because other species are affected thereby threatening the ecological balance of the environment. The discharge of untreated wastewater and excreta into the environment affects human health by several routes (www.unwater.org).

4.3 Indigenous knowledge systems and sustainable water and sanitation practices

The study established that indigenous knowledge systems are key to the success of any community development project. Findings from the focus group discussion indicated that IKS were relevant in water and sanitation programmes in the community for the reasons that they provide a firm foundation for planning, implementing and evaluating community projects. WWF (2013) indicate that indigenous knowledge systems are part and parcel of a community's identity and forms the foundation of community livelihoods, connecting people to their land and natural resources. Practitioners have also become aware that including indigenous knowledge systems in rural community projects leads to effective and collaborative problem solving and enhances motivation among the local population.

Using indigenous knowledge systems in development enterprise enables indigenous people and local communities to actively participate in the decision-making process. IKS is a powerful resource for rural people and therefore remains a key element in sustainable development (Boven&Morohashi, 2002).

4.4 Integrating Indigenous knowledge systems in water and sanitation programmes

Thereis evidence from a number of studies that many development practitioners have started appreciating the integration of IKS in their development enterprise. But the challenge of backwardness or underdevelopment still remains in many rural communities in Africa (WWF, 2013). Therefore, understanding a more meaningful way of integrating IKS in rural projects remains an imperative for development enterprise. In this study, it was established that there werea number of IKS available in the community. But not all of them were relevant to the focus of the study. Even after narrowing the focus of the study to water and sanitation, it was discovered that it was not all IKS which could be relevant to the subject area. For instance, the use of open space for defecating is regarded as a coping strategy but a bad

hygiene practice. Regardless of defecating in open space being a bad practice,it is part of IKS in this community, but not very useful in the quest for sustainable development.

The study established a three stage process towards the integration of IKS in education for sustainable development. These steps are: a.*identification of available IKS, b.Isolation of IKS, and c.situating IKS in the context of the programme*. It was found that the identification of IKS should be a collaborative process between the community and the development agencies. This process enables the community to develop a firm ground on their assimilation and subsequent utilisation of western knowledge to solving problems in the local context.The second stage is the isolation of the identified IKS. This is based on selecting collaboratively IKS which are relevant to a given project, that is, water and sanitation. Once this is done, then the third stage is the integration of the identified and isolated IKS in the context of the programme. The actual integration is based on the use of different models of integration namely top down model, bottom up model and eclectic model. Although the development practitioner may not have technical knowledge, it is always important to begin from existing indigenous knowledge of people.

Currently, IKS is being integrated minimallyin both Integrated Water Resource Management and water and sanitation in the country. The common practice is that most development agencies have continued to take programmes to different communities without considering the local needs and conditions of the people.

5. Conclusions

From this study it was concluded that indigenous knowledge systems which are linked to spirituality have worked successfully for a long period of time in the preservation of the environment. It was also noted that external and internal factors have led progressively to the erosion of indigenous knowledge and practices. For instance, new needs have emerged putting pressure on traditional management systems while land and resources have shrunk due to population dynamics and competition among the users.

The study concluded that the integration of indigenous knowledge systems in water and sanitation programmes remains critical. It will be very difficult to achieve sustainability in this area if development agencies decide to ignore IKS in the communities in which they are operating. The study has also established that using the three stage process of identifying the available IKS on water and sanitation, isolating them and integrating them in the development process would provide a meaningful approach towards the attainment of sustainable development in the area of water and sanitation in rural communities. This approach should not be implemented in a hurry as is the current practice. It requires patience and taking into consideration all the necessary information about the IKS available in the community. The sustainability of community projects such as water and sanitation should be based on the active involvement of the community itself, the felt needs of the people, their initiative and aspirations.

6. Recommendations

a. Before water and sanitation projects are launched in a community, there is need to involve the main users of the environment in which the project will be situated.

b. There is need to have an in-depth understanding of the IKS through research in order to find suitable ways of integrating them (IKS) in modern development. This will not only allow for longer sustainability of the project but will have a positive contribution to the welfare of the people and environment too.

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