Analysis of Indigenous Knowledge in Swaziland: Implications for Sustainable Agricultural Development

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ATPS Working Paper Series No. 34

Published by the African Technology Policy Studies Network, P.O. Box 10081, 00100 General Post Office, Nairobi, Kenya

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ISBN: 9966-916-89-X

Executive Summary

The search for sustainable solutions to the development and technology problems that continue to confront developing countries has led to renewed interest in the potential contribution of Indigenous Knowledge (IK) to research and development activities. This has been defined as a systematic body of knowledge acquired by local people through accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture (Rajasakeran, Martin and Warren, 1992). It is unique to a particular group, and local people such as farmers, who are custodians. The potential use of it in agriculture is widely acknowledged, but lack of documentation on indigenous knowledge systems poses problems for researchers, policy makers and rural development practitioners.

The overall objective of this study was to document IK in Swaziland. The focus is on its application in agricultural practices, natural resource management and livelihood systems. A combination of secondary and primary data was used for documentation to determine the extent of use, identify constraints, and attitudes, to users, and its role in development.

The study has generated several area-specific reports namely: trees/plants for food, crafts, livestock, and as human medicine. The study found that the uses varied by agro-climatic conditions. The use of tress and plants for medicinal purposes for humans and livestock and handicraft varied from frequently used to very frequently used. Indigenous foods were seldom used.

Problems associated with knowledge, attitudes and availability were identified as constraints in the use. Specifically, lack of knowledge and appropriate technology, shortage of land, attitudes towards indigenous practices, drought and lack of documentation, were identified as barriers to its practices. The report concludes with recommendations on how the findings can be translated into action by incorporating IK into development activities.

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Abbreviations and Acronyms

GDP	Gross Domestic Product
IK	Indigenous Knowledge
IKS	Indigenous Knowledge Systems
MOAC	Ministry of Agriculture and Cooperatives
PRA	Participatory Rural Appraisal
RDAP	Rural Development Area Programme
SNL	Swazi National Land
TDL	Title Deed Land

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Chapter One

Introduction

Country background

Agriculture has always been the mainstay of the economy of Swaziland. In 1988/1989, the agricultural sector accounted for 5.2% of the Gross Domestic Product (GDP) (Economic Planning Office, 1990). However, a major proportion of this agricultural production was from Title Deed Land (TDL), where farming is irrigated and market-oriented. Agricultural production on Swazi National Land (SNL), where most of the Swazi nationals reside, would be what Chambers (1989) characterizes as complex, diverse and risk- prone. The reliance on rainfall has made these households very vulnerable to drought-induced food and income insecurity (Musi, 1993).

The ultimate goal of governments worldwide is the raising of living standards of the population. The Government of Swaziland (GOS) sets forth policies and programmes which are pursued in the development plans. Typically, these development plans run for five years. A review of the development plans since independence reveal that the Ministry of Agriculture and Cooperatives (MOAC) has been the main vehicle by which the government hopes to improve the well-being of the majority of the Swazi rural population[1]. The projects and programmes of the MOAC target the improvement of the well-being of the rural population through the improvement of the performance of traditional agriculture on SNL. The main mechanisms for achieving these goals have revolved around the activities of the Rural Development Area Programme (RDAP)[2]. The objectives of the RDAP have been to increase agricultural production and improve the living standards of rural people, while protecting the natural resources. A comprehensive review of the RDAP recommended that rural development measures and strategies should be pragmatic, flexible, cost effective, and encourage community initiative and participation.

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[1]Economic Planning Office, 1990; Government of Swaziland, 2nd, 3rd and 4th National Development Plans.
[2]Government of Swaziland, 3rd National Development Plan.

Documenting the indigenous knowledge systems (IKSs) of the rural population is one route to recognizing the initiative of the community.

Literature abounds with examples of how sub-Saharan Africa is increasingly finding it harder to feed itself[3]. The livelihood of most of the households in this region is mostly dependent on low resource or subsistence agriculture.

Agricultural research has made great strides in improving commercial and irrigated agriculture, but this has not been the case with the resource-poor farmers who have to eke out a living on marginal lands. Chambers (1989) stated that farm families that practice this type of agriculture are unlikely to benefit from conventional agricultural research, because they often have inadequate resources to purchase inputs. This has meant non-adoption of the recommendations from agricultural research. He further explained that the manner in which the recommended technology came into being is the reason behind this non-adoption. Rather than the transfer-of-technology approach of conventional agricultural research, Chambers recommends the "farmer first" approach whereby the knowledge, problem identification, analysis and priorities are done by the farmer as a full participant. In comparing the transfer-of-technology and the "farmer first" approach, Chambers (1989) states that:

> With farmer first, the main objective is not to transfer known technology, but empower farmers to learn, adapt and do better. Analysis is not by outsiders — scientists, extensionist, or NGO workers — on their own, but by farmers assisted by outsiders. The primary location for R&D is not the experiment station, laboratory or greenhouse, necessary though they are for some purposes, but farmers' field conditions. What is transferred by outsiders is not precepts but principles, messages but methods, a package of practices to be adopted, but a basket of choices from which to select. The menu, in short. is not fixed or table d'hote, but a la carte and the menu itself is a response to farmers' needs which are articulated by them.

[3]Hunting Technical Services Limited, 1983.

Conceptual framework

This study is based on the premise that the search for a solution to some of Africa's development and technology problems might be better served by building on a foundation of what people already know and what they have been practicing since time immemorial. Like in most other developing countries, the paucity of documented information on IKSs in Swaziland, denies researchers and rural development practitioners a knowledge base from which to build their activities. A large body of literature on indigenous knowledge (IK) exists (Warren, 1990). In order for anyone to understand IKS, it is imperative to develop its generally accepted working definition. It is after establishing the meaning that one can begin to appreciate its importance in rural development, technology improvement and the impact on agricultural development. IK is defined as a systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture (Rajasakeran et al., 1992). Local people such as farmers, both men and women, are believed to be the custodians. It is believed to be a dynamic knowledge system, simple but very useful in providing a framework upon which technical and scientific questions are built. IK localized knowledge systems which are unique to a particular society or ethnic group, in contrast to the international knowledge system generated by researchers (Warren, 1990).

Literature review

The potential use of IK in agriculture is widely acknowledged (Parrish, 1994; Dialla, 1994; Tabor and Hutchinson, 1994; Slikkerveer, 1993). It was asserted that IK has much to offer for sociological and cultural diversity and resource management and that indigenous people are an integral part of the ecosystem they manage[4]. Therefore, the best guarantee for the survival of nature is the survival of indigenous ideas. It was also reported that it covers all facets of human life and management of the natural environment. Furthermore, it is argued that its conceptual framework requires analysis at various levels and sustainable development requires its application. IK is holistic and culturally bound.

[4]Special Issue on IK and Development Monitor (1993).

In Burkina Faso, Dialla (1994) conducted a study on the adoption of soil conservation practices. This study was prompted by repeated failures of efforts to curb soil erosion. This was due to the lack of involvement of local people and the fact that when new soil conservation measures were introduced by extension services, they were not fully utilized, and thus failed. The study was guided by two fundamental questions which were asked in such a way that a clear distinction between indigenous and newly introduced techniques could be established. Farmers were asked:

(1) Which soil conservation practices they used before receiving assistance from extension services.
(2) Whether or not extension services proposed any new practices. A total of 120 male heads of households were interviewed.

The results of the study revealed that a great majority of the farmers used mostly their indigenous (simple) soil conservation techniques, rather than the newly introduced ones. Dialla (1994) concluded that farmers trust practices that they have used for years and are more likely to adopt techniques which are perceived to be less risky .It was noted that new techniques require an investment of resources and time and may not be worth it.

Parrish (1994) reported on indigenous post-harvest knowledge in an Egyptian oasis. A new approach to pest management had been introduced in the western desert of Egypt. As a result of this introduction, there was free distribution of pesticides in order to encourage their adoption in place of indigenous practices. However, Parrish reported that some farmers stated that the introduction of these new pesticides had made pest problems worse and created environmental problems as well.

According to Tabor and Hutchinson (1994), development policy that undermines or contradicts viable indigenous resource management strategies is unlikely to be sustainable. They further argued that basing surveys on indigenous knowledge assures that effort is concentrated on the most valuable resource types. They concluded that using IK ensures that the most important factors determining resource value and management practices are captured during the survey. Additionally, they found that use of local terminology ensures that the information generated can be easily disseminated.

Kabuye (1993) reported on an indigenous food plants' programme in Kenya. This programme aimed at improving diets as well as preserving cultural practices and biodiversity. Also, the programme is believed to be charged with providing data for use in conservation and development. Kabuye further reported that the programme involved rural communities first as sources of information on food plants, and later, as promoters of some foods on a larger scale in their communities. The ultimate goal was to encourage communities to take a greater interest in the continued use, conservation and propagation of wild plants. He concluded that the project had a significant contribution to make in improving food security, the nutritional base and the preservation of cultural and indigenous knowledge.

Research problem

In Swaziland, IK has not been systematically documented and thus not well appreciated. The absence of IK centres has contributed to its neglect. Instead, more discussions are focused on contemporary scientific knowledge systems and how they have failed to address the agricultural and environmental concerns of the people. Its neglect has made it difficult to determine and establish the extent to which people use it in their various activities, to insure sustainable agricultural development. It is also difficult to base research or development of technology on IKSs, since it has not been documented. In this regard, it becomes imperative to conduct a phased inquiry on these in order to systematically document IKSs and determine the prospects and constraints for incorporating them in development projects.

Research objectives

The objectives of the study were to:

- document the indigenous knowledge of selected men and women in Swaziland, pertaining to agricultural practices, natural resource management and livelihood systems
- determine the extent of use of these practices
- identify the constraints in using these practices
- determine the attitudes of IK users towards the role of IK in development

Chapter Two

Methodology

Design of the study

The study was designed to provide descriptive information. Hence, the researchers were able to describe the IK situation in Swaziland as observed and reported by the users and key informants.

The study included men and women who were using it in their farming activities, members of existing groups, and involved home economists and agricultural officers of the Extension Division in the Ministry of Agriculture and Cooperatives. The groups were selected and stratified by the ecological zones of Swaziland.

Instrumentation and data collection

The data collection included three phases. During the first phase, data was gathered through archival literature, visits to the national museum, and correspondence with IK centres worldwide. Correspondence with these centres generated a global view of IK.

Following the desk literature search, an interview guide was designed. This interview guide was reviewed by the researchers, colleagues at the University of Swaziland and home economists, to establish its validity.

The second phase involved the identification of key informants, including men and women who were considered well versed in IK. These were identified through the assistance of home economists and agricultural extension officers, field supervisors and university teaching staff. An interview schedule was used to gather information from the key informants. From the preliminary field work, it transpired that IK tends to be community specific and this called for an open-ended instrument, hence the decision to use an interview guide that allows flexible probing and dialogue. Observations of exhibits in agricultural shows held in the four regions of the country were also a source of important information.

During the third phase, participatory rural appraisal (PRA) methods were used to gather information on domesticated foods, wild fruits/foods, animal foods, natural resources, use of trees for dyeing, treatment of livestock and human ailments, other indigenous practices, and barriers to the use of IK to determine and identify its status in Swaziland.

The study used mainly qualitative data. Content analysis was used to analyze the data and descriptive statistics were used to present the data in this study. "Descriptive" coding and interpretations were used to reflect and describe the responses, because of the nature of the study. The rating scale in some domains was used to indicate the people's knowledge of IK.

Chapter Three

Findings

Documentation of IK

The data for documentation was qualitative in nature and collected from archival sources, focus groups and key informants. Initially, the documentation was to cover broad areas which were derived from the review of the literature. These were agricultural practices, natural resource management and livelihood systems. Within these three broad areas, the analysis resulted in the development of a conceptual framework where IK was conceived to be a locally based system revolving around the procurement of food, and exploitation and utilization of natural resources to support a sustainable livelihood system.

Figure 1 shows the evolution of the conceptual framework for the study.. Ultimately, the framework included the following domains:

(1) domesticated foods
(2) wild fruits
(3) animal foods
(4) trees/plants used for dyeing handicraft
(5) trees/plants used for livestock
(6) trees/plants used for human ailments
(7) miscellaneous IK practices

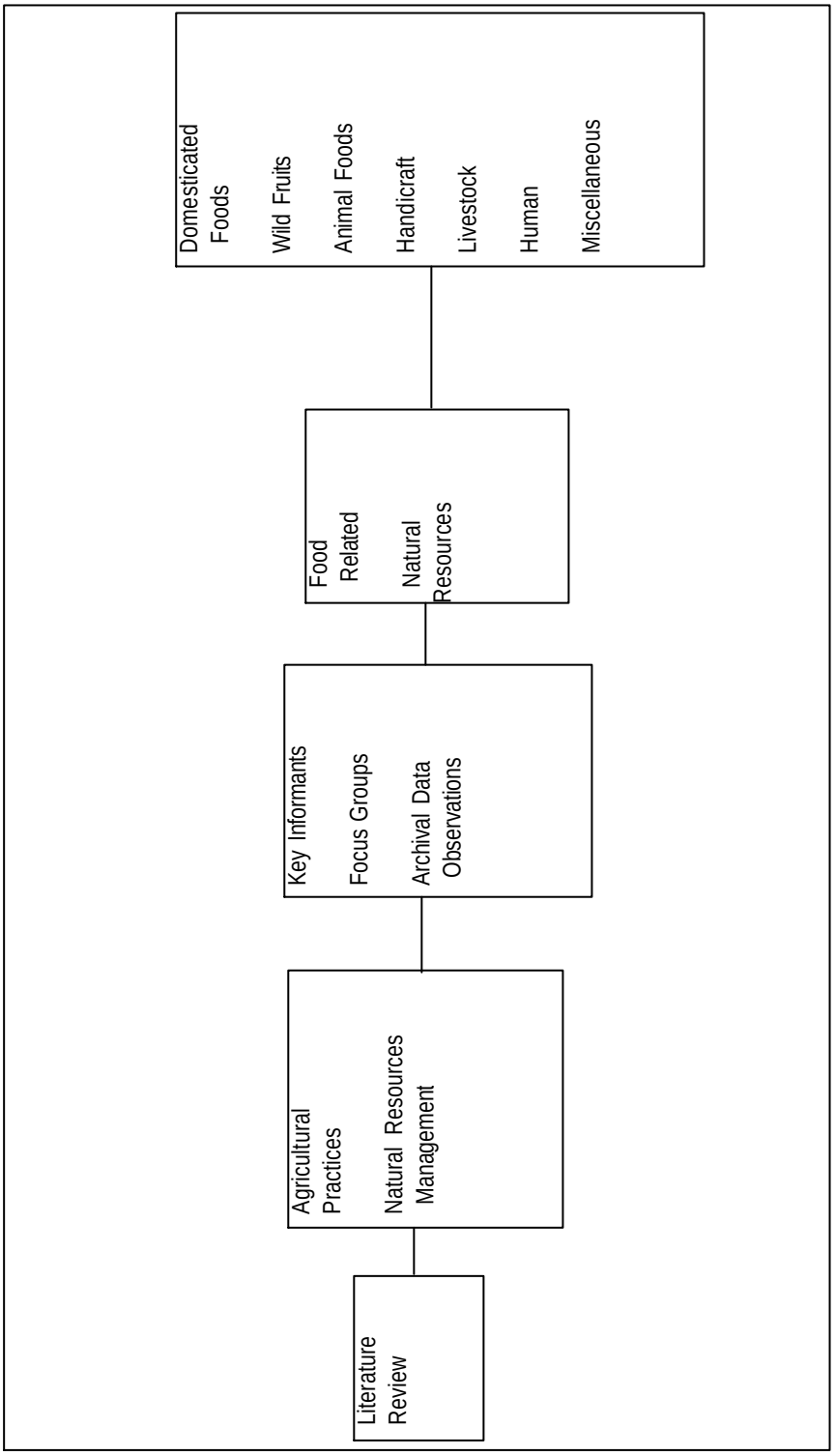

Figure 1: The conceptual framework of the study

***Food related IK*:**

(1) Domesticated foods

Issues of preparation, technology availability and changing preferences, dominated the documentation on food related IK. In all the regions, foods prepared from domesticated crops ranged from legumes (e.g. jugo beans, cowpeas, mung beans), combined with maize in various forms, to domesticated foods consumed for their medicinal properties. The same food would be called different names depending on the part of the country.

(2) Wild fruits/foods

Indigenous foods that were not domesticated were eaten mainly as fruit, relish snack, or used to prepare other foods. Fruits were often described as versatile in that they could be used for several purposes. The same fruit could be eaten as fresh or dried fruit, combined with maize, brewed as an alcoholic beverage, or used as relish, a dye for handicraft or for medicinal purposes.

(3) Animal foods

The various indigenous animal foods that were documented were used mainly as relish, i.e, as an accompaniment for maize porridge.

***Natural resources*:**

Several natural resources were identified as being used in handicraft production and dyeing, and in the treatment of livestock and human beings.

(1) Trees/plants used for dyeing handicraft

Trees and plants were the main natural resource used for dyeing of handicraft. The parts of the tree/ plant used for obtaining the dyeing material included leaves, bark and roots. A summary of the trees/ plants used for dyeing handicraft is presented in Table 1.

The use of trees and plants for dyeing handicrafts is more prevalent in the Hhohho region. The use of the tree or plant did not depend on availability. Even where a tree or plant was available, not all the groups would use it. Use seemed to be more a function of the knowledge that the dye could be obtained from the tree or plant. In some communities where the trees were not available, the women would travel to the areas where they would obtain the necessary tree to dye their handicraft.

The regional differences in this practice confirm the general belief that more communities in the Hhohho region have retained a relatively fair amount of their indigenous practices.

Table 1: Trees/plants used for dyeing handicraft

Swazi Name	Scientific Name	Common Name
1. Singa/Umgamba	*Acacia davyii*	Red thorn
2. Umphendulo	*Catpurma calpurnia*	Wild laburnum
3. Siphafa	*Ziziphus mucronata*	Buffalo thorn
4. Umganu	*Sclerocarya birre*	Marula
5. Umvangati	*Pterocarpus angolensis*	Kiatt
6. Umcozi	*Syzigium cordatum*	Water berry
7. Lusololo	*Bauhinia galpinii*	Red Bauhinia
8. Inhlaba	*Aloe* spp.	Aloe
9. Umdlelanyamatane	*Euclea* spp.	Euclea
10. Inhlalamahubhulu	*Antidisma venosum, Bridelia micrantha*	Tessel berru, Mitzeerie
11. Inhlangushane	*Rhus* spp.	Rhus
12. Chuchuza	*Bidens pilosa*	Black jack
13. Umkhuhlu	*Trichilia emetica*	Natal mahogany
14. Libota	*Ilex* spp.	African holy
15. Umsobo	*Solanum*	—
16. Nukane	*Tegetes minuta*	—
17. Lishwaca	*Diospyros galpinii*	—
18. Umbhaba	*Sterculia*	Lowveld chestnut
19. Shibha	—	Acacia gerradi
20. Emabele	—	Sorghum
21. Vovovo	*Schotia* spp.	—
22. Mkhanyakudze	*Acaci xanthophloa*	—
23. Emakotapeni	—	Avacado
24. Bhotiruthi	—	Beetroot
25. Manyatsi	—	—
26. Lugwajumbe	—	—

(2) Trees/plants used for livestock ailments

Many indigenous trees/plants were identified as useful for livestock. They were used for treatment for ailments, breeding purposes and fattening cattle. The trees/plants are used alone, or in combination with other ingredients. A document on the trees and plants that were used for livestock and the purpose for which each was used has been compiled.

(3) Trees/plants used for treating human beings

The trees and plants used for treating human beings were also used either alone or combined with other materials. A document on trees and plants used for treating various human ailments and conditions is available. Various mixtures were used to promote cattle breeding and IK for diagnosing problems with livestock was also documented.

***Other indigenous practices*:**

There were various other indigenous practices that were identified and described. Examples, include the underground maize storage pit that can store maize for more than one season. The few examples of this indigenous technology that were observed were from only one agro-ecological zone in the country.

Due to the drought , groups have refined traditional irrigation methods to ensure the efficient use of water and conservation of moisture. Indigenous techniques for food harvesting, prosessing, and improving of soil fertility are still practiced in the various communities.

Extent of use of IK practices

In this study, an effort was made to determine the extent to which the identified IK practices were used in Swaziland. Through the focus groups, key informants and observations, it was evident that the extent of various practices varied in different groups. In Table 2, information on the extent of use of the practices by the various groups is presented.

Table 2: Extent of use of IK practices by focus groups

Domain	Response
Domesticated foods	Ranged between rarely to occasionally used
Wild fruits/foods	Rarely to frequently used
Animal foods	Occasionally to frequently used
Trees/plants for dyeing	Frequently used
Trees/plants for livestock	Frequently to very frequently used
Trees/plants for humans	Frequently to very frequently used

The extent of use of the different domains varied by agro-climatic conditions. On Table 2, the use of trees and plants for medicinal purposes for humans and livestock and for dyeing, ranged from frequently used to very frequently used.

The extent of use of indigenous foods was less frequent. It ranged from being used rarely to occasionally used, for domesticated foods. Some of the food was no longer available due to changing farming practices, while others involved a lot of preparation and processing time, and in certain cases the

cooking time required and the shortage of firewood, meant less use. In a few instances, the preparation methods had been lost over generations. The foods that were occasionally used tended to be those that are consumed mainly for their medicinal and health benefits (e.g. “inshubaba”), while others are consumed frequently when they are in season, but are not preserved for use when they are not in season.

The extent of use for wild fruits/foods domain ranged from rarely to frequently used. Environmental degradation and changing rainfall patterns had led to the disappearance of some trees and others were no longer bearing as much fruits as in the past. Those that were used frequently (e.g. “maganu”), were thriving because they were an important seasonal source of income for women. The extent of use of animal foods were occasionally to frequently used. The disappearance of the animals and the loss of the skills used to harvest or collect the animal foods over generations are responsible for the decline in use.

The frequent use of trees/plants for dyeing handicrafts was attributed to the need for alternative sources of income. The natural resources for handicrafts are declining, but the women were prepared to travel long distances in search of the trees and plants. Livestock plays an important cultural and economic role and consequently, the use of trees and plants for livestock and humans ranged from frequently to very frequently used. Experts in this IK are sought if the trees/plants are not available in the area. The affordability and accessibility of IK for use on humans was the reason given for the very frequent use of indigenous plants on humans.

Constraints in using selected IK practices

Several barriers to using IK practices were identified. Problems associated with knowledge, attitudes and availability of resources dominated the constraints that were of major concern in the focus group discussions and key informant interviews. The following constraints were identified:

(1) Lack of knowledge: While some of the farmers would report that they knew about the existence of the indigenous practices, lack of knowledge would be cited as the reason why the IK would not be used or practiced. A farmer would, for example, know about the existence of a certain indigenous food, but because of lack of knowledge about how to prepare it, the food would rarely or never be consumed.

(2) Lack of appropriate technology: Certain indigenous technologies are no longer available and there are no appropriate substitutes. The grinding stone is the only technology that is suitable for the preparation of some indigenous foods. However, because an increasing number of rural households no longer have it; those foods are no longer frequently prepared and consumed.

(3) Shortage of land: The decline in consumption of some of the domesticated foods was attributed to the shortage of farming land. Pressure on the land has led to smaller land holdings per family and this was used for maize growing and there was very little land left for growing other indigenous crops such as legumes. In addition, the indigenous practice of leaving land fallow for one cropping season or more,

can no longer be practiced, because of the shortage of land.

(4) Attitudes towards indigenous practices: The attitudes of people, particularly the youth, was often cited as a barrier towards the use of IK. Socialization, the education system, the influence of western technology and the unavailability of certain crops, has meant limited exposure of the youth to IK.

(5) Drought: The drought spell was blamed for the decrease in the use and consumption of some indigenous crops. The drought has contributed to depletion of the indigenous seeds and farmers are now using hybrid seeds, some of which are not suitable for the preparation of traditional foods. Certain species of indigenous trees did not survive the drought, hence they are no longer available to the farmer for various purposes, as fruits and for medicine.

(6) Lack of documentation: The absence of documentation on IK has made schools and training institutions to ignore it. Hence, it has been left to the older generation to pass this information on to the youth through oral education.

Chapter Four

Conclusions, Recommendations and Implications

This study was prompted by the need to systematically document IK pertaining to agricultural practices, natural resource management and livelihood systems, and to determine the extent of use and the constraints inhibiting the use of these practices. Ultimately, this report should be followed by dissemination of its findings to the users, potential users, policy makers, and any other stakeholders in IK practices in Swaziland.

From the results of this study, several conclusions and recommendations were made.

Conclusions

(1) The interest in documenting IK practices is gradually gaining momentum in other countries and regions as evidenced by the review of literature and correspondence with IK centres worldwide.
(2) The present generation of adults is aware, and practice it to some extent. However interest in, and knowledge and value of IK is losing ground. The youth in particular and people in general, need to be made aware of the simplicity, adaptability and sustainability of IK.
(3) Trees or plants as indigenous resources can be used for various purposes as evidenced in the domains.
(4) There are many IK practices which are still being used in Swaziland as evidenced in the domain on other indigenous practices. However, the users do not publicize the use of these practices due to various reasons.
(5) Indigenous foods are fast disappearing from the Swazi diet. Yet, some indigenous foods have proven to be more nutritious and safer than western foods and can also serve as medicinal sources.
(6) There are a number of factors which have been barriers to the use of IK practices by the Swazi people.
(7) The extent of use of IK indicates its potential as a source of income through commercialization.

Recommendations

(1) Within each domain of IK there is need to develop systematic baseline data for reference in Swaziland.
(2) There is need to further examine the link between the IK system and the western technology. Once such a link is established, the value and contribution of either type of technology to agricultural development would be better appreciated.
(3) It is recommended that propagation and protection of the valuable trees or plants which can be used as food sources and for medicinal purposes to both livestock and humans, should be encouraged.
(4) It is recommended that, for sustainability, effort should be expended to revive some of the major indigenous practices that Swazis can afford and adapt the practice to the local situation.
(5) It is recommended that another study should be undertaken to determine the opinions of field supervisors in agriculture and home economists (extension), in order to confirm the views held by the actual users of IK practices.
(6) Effort should be made to find ways to alleviate and even curtail some of the constraints which prevent people from using IK in Swaziland.
(7) There is need to find ways to educate the youth about IK systems by incorporating IKS into the school curriculum. Oral education is not as effective as formal classroom education.
(8) There is need to consider the establishment of an IK centre in which all the systematically documented information can be kept.
(9) A national workshop to share the findings of this study should be undertaken to disseminate the results so that all the interest groups can be involved in formulating a plan of action for making IKSs in agricultural development more visible.
(10) There is a need to conduct further research in order to analyze and determine the chemical and medicinal ingredients of trees or plants that were said to be used for treating both livestock and humans.
(11) A study should be conducted to determine the acceptability of indigenous foods and the prospects for incorporating indigenous menus into restaurants.
(12) There is a need to initiate and develop legislation which could encourage protection of those plant species which can be used for medicinal purposes.
(13) The potential for commercialization of IK calls for protection of rights of the owners.

Implications

Based on the findings, the conclusions and recommendations of this study, several implications can be made. First, in order for any country to ensure that IK is utilized most efficiently and productively, it is imperative to establish perceptions of IK users (as well as potential users) and their attitude towards it in general. Western technologies are gradually replacing IK technologies, yet, a portion of the users cannot afford to pay for the western technologies. Second, systematically documenting it would be a milestone in creating a sustainable reservoir of information that can be used now and in future decades. Thirdly, because there are plant species which are used for medicinal purposes, efforts should be expended to formulate legislation or laws which will protect such species from becoming extinct. Further, if IK is incorporated into the modern technologies, there is need to protect the ownership rights of the indigenous people. Finally, problems that inhibit its use should be isolated and efforts be made by committed governments to provide support to researchers and policy makers, to further research and develop strategies to have people use IK.

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ATPS is supported by a growing number of donors including the International Development Research Centre (IDRC), the Carnegie Corporation of New York, the Rockefeller Foundation, the World Bank, the OPEC Fund, Ford Foundation, Coca-Cola Eastern Africa, the African Development Bank, and the Royal Dutch Government.

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Email: info@atpsnet.org
Website: http://www.atpsnet.org

ISBN: 9966-916-89-X