

LOCAL COMMUNITY INVOLVEMENT AND SUSTAINABLE CONSERVATION OF WATER IN KENYA.

A SURVEY OF MT KENYA AND ABERDARE RANGES IN NYERI COUNTY CENTRAL KENYA

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Abstract

Water is life because without it, nobody or anything can survive in this world, but the trend in the world is that the volume of water as an essential resource is diminishing day by day. This study sought to investigate the role of involving the local community in conserving this rare and important resource. The study assessed the involvements in terms of decision making, policy formulation, management and financial factors and the relationship between community involvement and sustainable conservation of water. The study was a survey of Mt Kenya and the Aberdare ranges in Nyeri County in the central region of Kenya being the source of the two big rivers (Tana and Uaso Nyiro) in Kenya. Primary data was collected using semi-structured questionnaires which were to be filled by members of the communities involved and those that are sidelined in the conservation of water in their region and government representatives who are ministry of water officials, and forest officers. It also included site visits to the regions for observation purposes. Analysis was done using descriptive statistics and data was presented in tables, charts in frequencies and percentages. The research found that there was a great difference in places that involved local communities in the utilization of water and those areas that the local were not included in the use of this resource. This was not only a concern for conservation but even peaceful co-existence among the communities which were given opportunities to decide on how well they can share and conserve the scarce resource. The findings revealed that there was a positive relationship between involving communities within the water sources and the conservation of the resource.

Key Words: Sustainable conservation, Diminishing, essential resources, positive relationship, scarce.

INTRODUCTION

Water is life! It is essential for all aspects of our livelihood, from basic drinking-water to food production and health, from energy production to industrial development, from sustainable management of natural resources to conservation of the environment. Water also has religious and cultural values. Unfortunately, water is becoming scarce in many areas and regions of the planet. The latest data from the World Water Council's *Report on sustaining water* (1996) show clearly how alarming the situation is: "In 1950, only 12 countries with 20 million people - faced water shortages; by 1990 it was 26 countries with 300 million people; by 2050 it is projected to be as many as 65 countries with 7 billion people, or about 60 percent of the world's population, mainly in the developing countries". The report calls for immediate and effective action in

order to maintain freshwater availability in the coming century.

As documented in the recently published report on freshwater management (Liniger *et al.*, 1998), mountains play a crucial role in the supply of freshwater to humankind, in both mountains and lowlands. The key to assessing the impact of land use in the mountains on water resources is an understanding of how land-use changes, and particularly intensification, affect the water cycle. Rodda (1994) clearly expresses the challenge: "From the hydrological point of view, mountain regions present a paradox. Although they provide the bulk of the world's water resources, knowledge of these resources is generally much less extensive, reliable and precise than for other physiographic regions." As Klemes (1988) says, mountain regions represent, in practical terms, "the blackest of black boxes in the hydrological cycle".

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PROBLEM STATEMENT

Worldwide, 214 river basins, host to 40 percent of the world's population and covering more than 50 percent of the earth's land surface, are shared by two or more countries. The distribution of water from mountain areas was the cause of 14 international conflicts noted in 1995. For example, the Arab-Israeli conflict, although primarily a security and territorial dispute, also involves the supplies of freshwater from the Anti-Lebanon mountains, Mount Harmon, the Golan Heights and the hills of the West Bank. Disputes over water also arise on a smaller scale, between highlands and lowlands within national borders as, for example, around Mount Kenya. (World Resources Institute)

Decreasing dry season river flow is a serious problem; since the 1960s, the average dry season flow of the Ewaso Ng'iro River has been reduced in the lowlands to one-eighth of its previous level. Since the 1980s, the once perennial river has had prolonged periods with no flow. Consequently, the unique wildlife ecosystems of the Samburu and Buffalo Springs game reserves in the lowlands suffer during the drought period and this has had a negative impact on tourism, the primary source of foreign exchange in the region. Nomadic pastoralists and their livestock, and the wildlife in the lowlands, are drastically affected and are forced to move upstream in the search for water and grazing land. As a result, conflicts with farmers are increasing. It is from this situation that the researcher was interested to know whether the involvement of local people can eradicate those conflicts and help in sustainability of water

LITERATURE REVIEW

Mt. Kenya forms a Large Ecosystem and contributes essentially to the water supply in Kenya as it is a water tower, with Ewaso Nyiro and Tana River being the most significant rivers that bear their sources from Mt. Kenya. The National Park and the forest reserve comprises of 71,500ha and 199,500 ha respectively. First comprehensive studies about Mt. Kenya were done in 1922 reports, Fries and Fries, (1948).

Rivers originating from the glaciers of Mount Kenya flow through the montane, high elevation moorland to the forest belt, where rainfall is highest, and rivers and groundwater aquifers are recharged. Ninety percent of the dry season flow of the Ewaso Ng'iro River collects in the alpine, moorland and montane forest belts (above 2 400 m) on Mount Kenya. On

the lower mountain slopes and in the piedmont, both the population and the area of cultivation have more than tripled over the last 20 years and river water abstractions for irrigation have dramatically increased. Currently, 60 percent of the people in the Ewaso Ng'iro basin live in this area and the remainder live downstream on the semi-arid plains, where they depend for their livelihood on water generated upstream.

Two main factors are affecting river flow in the lowlands: . The latest data from the World Water Council's *Report on sustaining water* (1996) show clearly how alarming the situation is: "In 1950, only 12 countries with 20 million people - faced water shortages; by 1990 it was 26 countries with 300 million people; by 2050 it is projected to be as many as 65 countries with 7 billion people, or about 60 percent of the world's population, mainly in the developing countries". The report calls for immediate and effective action in order to maintain freshwater availability in the coming century. As documented in the recently published report on freshwater management (Liniger *et al.*, 1998), mountains play a crucial role in the supply of freshwater to humankind, in both mountains and lowlands. The key to assessing the impact of land use in the mountains on water resources is an understanding of how land-use changes, and particularly intensification, affect the water cycle. Rodda (1994) clearly expresses the challenge: "From the hydrological point of view, mountain regions present a paradox. Although they provide the bulk of the world's water resources, knowledge of these resources is generally much less extensive, reliable and precise than for other physiographic regions." As Klemes (1988) says, mountain regions represent, in practical terms, "the blackest of black boxes in the hydrological cycle".

Any intensification of land use from natural forests to plantation or agriculture increases the probability of reduced water quality. Even if the water cycle is unchanged, use of fertilizers, insecticides, herbicides or other substances may pollute water resources downstream. Siltation is also a problem where erosion rates increase as a result of removal of vegetative cover. As runoff increases, non-point source pollution is likely to become a serious threat to water quality. Whereas in many cases, point source pollution has been reduced in recent years, non-point source pollution has increased and is a much greater threat. The role of providing and protecting water resources has been attributed to forests for generations. Folk tales and myths throughout the world illustrate that natural forests provide clear and pure water (Küchli, 1997).

A growing population and immigration into the area surrounding Mount Kenya increase the water needs for drinking, for industrial and urban use and, most important, for irrigation. In addition, the control and management of abstractions is inadequate. Currently, ten times more water is taken out than regulations, if properly supervised, should allow. Monitoring of abstractions, improved procedures for allocation and better management and control are urgently needed. Changes in land use also have had an impact on river flow and water quality. Removal of vegetation cover and intensified land use on the northern slopes of Mount Kenya have led to increased surface runoff during heavy storms, causing erosion and pollution of the surface water. Flash floods, previously unknown, have been recorded in recent years flooding old farm houses and tourist lodges. Investigations are still being undertaken to quantify the impact of human activities and land-use change on runoff and floods, and on river flow during the dry season. According to Stone (1992) over exploitation of the perennial rivers, which all originate in the mountains causes severe problems in the drier lowlands, where pastoral systems, game reserves and national parks important to tourism depend on these water resources. Ewasong'iro River, which flows north from Mt. Kenya in the drier lowlands, has been diminished by 50% in the dry season during the last 30 years owing to immigration of small scale farmers to the semi arid plateau of North West of Mt. Kenya. These farmers use water up stream for irrigation and home consumption.

Soil moisture measurements under different land uses show the amount of water lost through evapotranspiration. A comparison of natural forests with plantations and cropland on Mount Kenya showed that soil under cypress plantation was the driest, as the water was used up much faster than under natural forest. Rainfall was not sufficient to recharge the groundwater. Under natural forest, the soils were more moist and there were periods of groundwater recharge. It is only natural that a fast-growing tree will use more water than a slow-growing one in absolute terms (but not necessarily so in terms of consumption per cubic metre of wood produced). Under crops such as potatoes the soils had a higher water content and groundwater recharge was the highest. Although surface runoff occurred during heavy storms, cropland still provided the greatest contribution to groundwater and river flow. Environmental education is a process of recognizing the value and various conceptions of the environmental. Aim of determining the skills and reproaches necessary for understanding the

relationship between man, his culture and biophysical environment, (UNESCO, 1988). Education can be defined as the entire ways one person tries to influence the behaviour of another person, and in this context behaviour may include knowledge skills and habit attitudes.

Through formal education, organized instructions are provided by teachers in institutions while informal education can be learnt from people or agencies whose primary purpose can be something else other than organized instructions, as it is in families and other social groups. Awareness to the general public of the dangers of forest destruction and the need to protect the forest is one a strategy that may see Mt. Kenya West forest re-sustained.

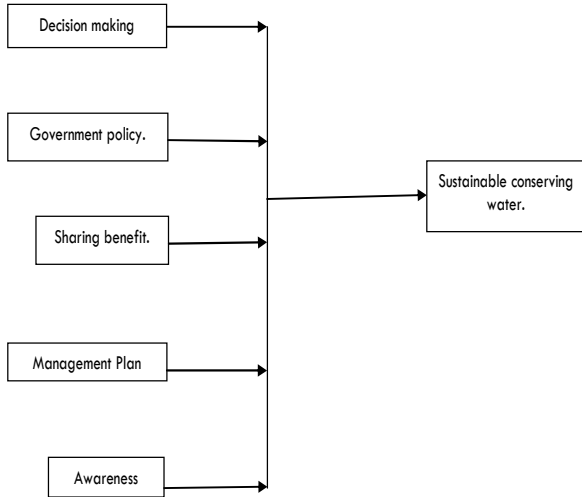
However Mathu, (1986) says that public education alone about forests and wildlife with no other alternatives sources of benefits is to no avail. Improvement in educational opportunities and other social services (health, family planning) play a critical role in achieving economic development and protecting the environment.

Educated people are in a better position to respond to incentives and opportunities. Literacy and education supports the less likelihood of exhausting the fragile zones and more apt to diversify their economic activities without putting pressure in the environment. (UNESCO-1987 Nairobi). The vast settlement area bordering Mt. Kenya EAST stretches about 100km by 50 Km from Meru County, Laikipia County, in the south, Kirinyaga County in the north and Nyandarwa County to the east. It is this community that has a direct impact on the resources of Mt. Kenya West forest – social expenditure in the national budget can reduce human disinvestment especially in improvement of education of communities surrounding ecosystems.

METHODOLOGY

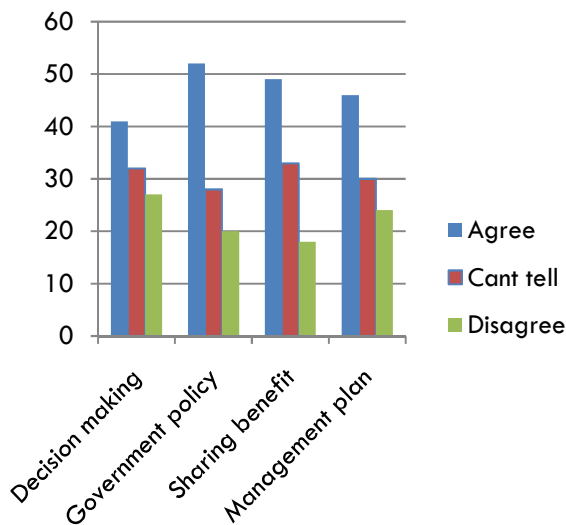
The study was a survey of the area comprising of Mt Kenya and the Aberdare ranges Nyeri County in the central region of Kenya being the source of the two big rivers (Tana and uaso Nyiro) in Kenya. Target population was the indigenous communities living within the county in the rural areas and purposely those neighboring the Mt Kenya forest and the Aberdare ranges. Primary data was corrected using semi-structured questionnaires which were to be filled by members of the communities involved and those that are sidelined in the conservation of water in their region and government representative who are

ministry of water officials, and forest officers who were selected purposively depending of their involvement in the management of these resource .It also included site visit to the regions for observation purpose. Analysis was done using descriptive statistics and data was presented in tables, charts in frequencies and percentages.



Findings

Monitoring of natural resources and their use and assessment of the impact of land-use change in the highlands on the availability and quality of water in the lowlands are the first steps towards successful management. Whereas the effects of land-use change on surface runoff and erosion can be clearly quantified in test plots and small catchments, the effects on regional hydrology need further investigation concurring with (Liniger and Gichuki, 1994). This will lead to better understanding and determination of crucial limits or thresholds for land use and land-use intensification.



Integrated resource management encompassing both the mountains and the lowlands is needed at the local, national and international levels, together with better cooperation between researchers, planners, decision-makers and users at all levels. The impacts of future human activities upstream on the availability of resources downstream need to be assessed so that mutually beneficial policies can be introduced. Only integrated basin management can ensure efficient use, equitable distribution, and effective management and regulation of mountain water for the benefit of all humankind.

CONCLUSION

Public education with the involvement of educated people is required on to the benefit of conserving the source of the water. They also must be informed that the resource must be shared with other people down stream. Decision making was another cited concern that must be solved by involving the leaders (elders) of the relevant communities. The policy of the government should be formulated such that the people on the ground are educated on the need of sharing this scarce resource. The government policy towards this scarce resource is not bringing harmony among all the beneficiary.

RECOMMENDATION

Involvement of each stakeholder when thinking of conserving issues. There is need of educating the public in preserving the eco system which includes water. If a dam is being constructed the benefiting people downstream and the people around the dam must benefit from the same dam. Compensation also is a requirement otherwise the community may take this as a invasion of their rights. Cultivating near the water pans, rivers, banks and forest destruction should be prevented become it a catalyst destruction of the resource. Every project concerning water must be decided with the involvement of the people but also must be seen to originate from the government to avoid issues over water.

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