

ENHANCING A PARTICIPATORY APPROACH TO ENVIRONMENTAL PROBLEM SOLVING IN WESTERN KENYA

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ABSTRACT

This article argues for a reorientation of the approaches to environmental problems from a scientific basis to a social, people oriented basis. Using examples from a research project in Western Kenya, (Maseno and Nagoya Universities), the article argues for a pro-people approach to tackling specific environmental problems. The paper argues for need to re-conceptualize the “farmer” and to differentiate people engaged in traditional socio-cultural activities from people in “farming business”. There is also need to include policy professionals in the process of engaging the “natives”, the researchers and the policy makers in solving local environmental problems. This will also involve a change in the “extension worker” policy from being reactive to pro-active. Since environmental issues are best understood in local contexts, Kenya’s devolved constitution presents the best scenario for achieving positive example for achieving positive orientation to environmental problem solving in Africa.

Keywords: Tropical Ecosystems, Interdisciplinarity, Indigenous Knowledge, Participatory Approach, Social Policy, RiverNzoia

INTRODUCTION:

“Environment moulds history”...Everything important that has happened to human since the Paleolithic era¹ is due to environmental influences. More precisely, all of the important differences between human societies, all of the differences that led some societies to prosper and progress and others to fail, are due to the nature of each society’s local environment and to its geographical location. History as a whole reflects these environmental differences and forces. Culture is largely irrelevant; the environment explains all the main tendencies of history (Blaut, 1999 p391)

¹ The earliest people lived during the Old Stone Age. The period is also called the Paleolithic Era. The Paleolithic Period began more than 2,000,000 years ago. These people were nomads. In order to find food, the Paleolithic people often had to move from place to place, hunting and gathering. Because of the lack of food and the constant moving, populations tended to be small. These people usually died at a very early age because of hunger, disease, or injury. from http://www.wfsd.k12.ny.us/webquests/Paleolithic%20and%20Neolithic%20Era_files/page0002.htm accessed 17th February 2014.

‘The environmental sociologist raises questions such as how our environment affects our behavior and how we change our environment’ (Honey, R; 1970), although the questions generally relate to ‘we’ as human beings. This means that it is important not to romanticize local knowledge, or to believe that alternative perceptions from disadvantaged groups may necessarily lead to better understandings of environmental change. The common association of ‘local’ or ‘indigenous’ knowledge with a better form of development than that associated with ‘Northern’ or ‘scientific’ knowledge is increasingly criticized, and linked more to the imposition of social categories on people than technical expertise of either knowledge system (Batterbury, S. et al, 1997 p129). The disruption of the environment and its protection raise problems of such complexity that no single academic discipline within its present boundaries can hope to make significant contributions to their solution without at least a basic familiarity with the knowledge of other relevant social and natural sciences (K. William Kapp, pg. 528).

This paper is divided into **five** sections. Section **one** is concerned with the theoretical debate about interdisciplinary approach to understanding management of environment in tropical Africa, with focus on biosocial science approach, tropical ecosystems and interdisciplinarity. Section **two** describes a project that was concerned with a particular environmental problem in western Kenya and how various approaches were applied in the particular case. Section **three** argues that sustainability in any aspect of environmental problem solving is intrinsically a policy issue that should involve all actors in the policy process. Section **four** justifies the need for an interdisciplinary project concerned with floodplain management along River Nzoia in western Kenya. Section **five** summarizes the main arguments and issues for further academic attention and practical action, including conclusions.

Understanding Approaches to Environmental Issues in Africa

1.1. Introduction.

Interdisciplinarity is undeniably the emerging theme in the organization of academic programs and funding agencies (Holland Jones J, 2009). Support for the quest for interdisciplinarity was lent by Karl Marx in his *Third Paris Manuscript*, 1844, when he said:

History itself is a *real* part of *natural history*, of the development of nature into man. Natural science will one day incorporate the science of man, just as the science of man will incorporate natural science; there will be one science. (Fox Robin, 1989, p11)

That is the concept of interdisciplinarity which underlies interdisciplinary understanding.

Individuals demonstrate interdisciplinary understanding when they integrate knowledge and modes of thinking from two or more disciplines (or well-established fields of study) in order to create products, raise questions, solve problems, and offer explanations of the world around them in ways that would not have been possible through single disciplinary means.

Indeed, anthropologists, for example, “must be willing to work in interdisciplinary teams. The boundaries of new knowledge lie in the interstices of traditional disciplines and extending these boundaries cannot be accomplished by the traditional lone ethnographer”, biologist, climatologist, or any other professional working in isolation (ibid. pg. 5)

Level one of misunderstanding approaches to environmental issues involves hitherto neglect of biosocial science by social scientists. This has resulted in the confusion over the nature of the subject matter of the social and behavioral sciences and the consequent confusion over *what* should be studied and *how* (ibid. pg.1).

Biosocial theories have not been popular with mainstream social scientists until fairly recently because they were interpreted as a sort of “biological determinism” (No author, no year). With respect to understanding our world, Crosswell and Sablo quote Jiddu Krishnamurti (1996) in the following words:

Intelligence operates when the mind sees the whole, the endless whole – not my country, my problems, my little gods, my meditations. It sees the whole implication of living. And this quality of intelligence has its own tremendous energy.

1.2. Human Development and Developmentalism

The study of human lives has become a lively enterprise over the past quarter-century, extending across substantive and diverse boundaries in the social and behavioral sciences. With this change has come an appreciation for "the long way" of thinking about human personality and its social pathways in changing societies. Developmentalists have gained more sensitivity to the interlocking nature of human lives and generations, as well as an informed awareness of individuals as choice makers and agents of their own lives (Elder 1994 p4) The argument here is that "development" is a continuous sociological process. The historical processes of industrialization, urbanization, secularization, modernization, etc. are social processes that have for generations been pushed into new frontiers by the minds and hands of humankind. The "backbone concept" of development is sustainability.

Sustainability is a relationship between dynamic human economic systems and larger dynamic, but normally slower-changing ecological systems, in which (a) human life can continue indefinitely, (b) human individuals can flourish, and (c) human cultures can develop; but in which effects of human activities remain within bounds, so as not to destroy the diversity, complexity, and function of the ecological life support system (Gladwin T. N. et al, 1995 pg.877).

The Western conception of history is that it has been characterized by man's increasing understanding and mastery of the physical environment, by the progressive triumph of mind over matter. The evidence of human history seems to confirm our sense that abstract, intellectual, spiritual elements are superior to material and physical things. This has led inevitably to a hierarchical ordering that informs our apprehension and judgment of human activities and experiences (Prown, 1982).

In the world of scholarship, the more abstract subjects, for example, mathematics, philosophy and literature are more highly regarded than concrete and practical subjects such as engineering (ibid). Such ordering takes place even within the material realm of artifacts where all things are not equal. Higher value has been attached to works of art than to utilitarian craft objects since the Renaissance² when a distinction was made between the arts, which require intellectual activity and creative imagination in their making, and the crafts, which require greater physical exertion and mechanical ingenuity (ibid). In architecture, for example, the mental activity of design has been considered an appropriate pursuit for gentlemen, while the actual physical labor of building has been carried out by laborers of the lower classes (ibid).

On the other hand, although expansion of agricultural land is widely recognized as one of the most significant human alterations to the global environment (Matson et al. 1997 pg 504),... there have been concerns about the long term sustainability and the environmental consequences of the intensification of agricultural systems, both locally, regionally and globally (ibid.). Local level consequences can include increased erosion, lowering of soil fertility and reduced biodiversity (ibid.)

1.3. The Native Man of the Earth

People have undoubtedly always been more mobile and identities less fixed than the static and typologizing approaches of classical anthropology would suggest. But today, the rapidly expanding

² The **Renaissance** ([UK/ri'neɪsəns/](#), [US/'renɪsɑːns/](#), French pronunciation: [\[ʁənɛsɑ̃s\]](#), from [French](#): *Renaissance* "re-birth", [Italian](#): *Rinascimento*, from *rinascere* "to be reborn")^[1] was a [cultural movement](#) that spanned the period roughly from the 14th to the 17th century, beginning in Italy in the [Late Middle Ages](#) and later spreading to the rest of Europe. Though availability of paper and the invention of [metal movable type](#) sped the dissemination of ideas from the later 15th century, the changes of the Renaissance were not uniformly experienced across Europe. (Wikipedia)

and quickening mobility of people combines with the refusal of cultural products and practices to "stay put" to give a profound sense of a loss of territorial roots, of an erosion of the cultural distinctiveness of places, and of ferment in anthropological theory¹ (Gupta and Ferguson 1992 pg.9)

Now, 'how does history remember the self-professed agrarian "peasant" relative to the certifiable agrarian scientist' (Jack, 2007 p.46-47)? In other words, 'if one wants a historical legacy, is it better to be credentialed scientist or a plain-spoken man of the earth?' (ibid. p 47). Understandably,

[i]n rural communities, founded on a set of shared values, familial histories and socio-economic exigencies, the question of difference pervades as well as preoccupies. Given the strength and rigidity of traditional rural membership paradigms, to be *in* often requires being native to a place- so thoroughly inside that it is not only possible to be *from* a place, but also, and more emphatically, *of* a place, and *for* a place. The prepositions—*from*, *of*, *for*—wed advocacy with geography. To speak from "inside" a rural community is to see subjectively, to self report, self refer and self diagnose, in rural communities such self-reliance—some would call it close mindedness—is often a point of pride (ibid. pp.40-41).

The point is to find out how we make a rural community have a positive orientation to a particular environmental issue, for example, soil erosion, that is slowly and steadily destroying their landscape?

Soil erosion is one form of soil degradation along with soil compaction, low organic matter, loss of soil structure, poor internal drainage, salinization, and soil acidity problems...Soil erosion is a naturally occurring process on all land. The agents of soil erosion are water and wind, each contributing a significant amount of soil loss each year... Soil erosion may be a slow process that continues relatively unnoticed, or it may occur at an alarming rate causing serious loss of topsoil. The loss of soil from farmland may be reflected in reduced crop production potential, lower surface water quality and damaged drainage networks (OMRAFA Staff undated). Another issue for concern is that more and more of us live in what has *been* called "a generalized condition of homelessness" (Gupta and Ferguson, op cit. pg. 9). This is a world where identities are increasingly coming to be, if not wholly deterritorialized, at least differently territorialized. Refugees, migrants, displaced and stateless peoples are perhaps the first to live out these realities in their most complete form (ibid.). However, the problem is more general. In a world of diaspora, transnational culture flows, and mass movements of populations, old-fashioned attempts to map the globe as a set of culture regions or homelands are bewildered by a dazzling array of postcolonial simulacra. In this culture-play of diaspora, familiar lines between "here" and "there," center and periphery, colony and metropole become blurred, because the famous distinction of rural/urban is becoming increasingly blurred in the Third World (ibid.)

1.4. Culture, Poverty and Inequality

These three factors still largely determine everyday life on Africa. Globally, poverty still has primarily a rural face, with two-thirds of the world's poor still constituted by rural poor (Borras et al. *undated*)². Its persistence has defied policy makers for decades despite sustained efforts by national governments, international institutions and civil society. However, effective control over productive resources, especially land, by the rural poor is crucial to their capacity to construct a rural livelihood and overcome poverty (ibid).

Although life in most parts of the developing world tend to be cultural, the fact is that cultural people tend to be less equal and tend to live in "home lands". Examples abound in Tropical Africa. However,

[i]f we can accept the notion of a single culture that includes the poor as part of it, then we can conclude that although improving the opportunities open to the poor will cause a rise in

their feelings of entitlement, those feelings will remain close to what is attainable and, therefore, they will not rebel. What seems more likely is that many of them will be motivated to increase their personal efforts and enter the middle class, the norms of which they know and generally wish to realize³(Carmon Naomi, 1985 pg. 414)

Secularization, economic development and globalization are supposed to *cover up* the dark side of culture, poverty, illiteracy and inequality in Africa. That is the devil in the detail! “The thesis of secularization had assumed that modernizing societies would become functionally differentiated, with increasing rationalization spelling the decline of the public significance of religion” (Englund H. no date)⁴. The extent to which this is being seen on the ground in Africa is still debatable. Secondly, Third World development as defined by official statistics such as population and housing censuses have not helped to shed light on daily human problems in Africa. Thirdly, globalization means “the multidimensional and interactive processes of economic, political, and cultural change across the world resulting in increased social interconnectedness as well as opportunities for social confrontation among peoples”⁵ (Twiss S.B. 2004).

People doing research in Africa need to ask themselves what these three forces have done to daily human life in Africa. Simple questions continuously turn up to be very difficult to answer. For example, by the year 2000; a) what happened to Health for All? What happened to Education for All? What happened to Water for ALL? Furthermore, 2015 is just a few months away, which country in Africa is able to see the possibility of attaining all the 8 Millennium Development Goals? How can people who are always in state of displacement and refugee situation manage their environmental problems?

There appears to be disagreement on how the environment-migration relationship is represented – specifically the term 'environmental refugee' (Morrissey 2012 p.35). There is also a way in which the term environmental refugee has become politicized, especially in relation to North/South population movements. But locally, especially in Sub-Saharan Africa,

[t]here are fast-growing numbers of people who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems. In their desperation, these "environmental refugees"... feel they have no alternative but to seek sanctuary elsewhere, however hazardous the attempt. Not all of them have fled their countries, many being internally displaced. But all have abandoned their homelands on a semi-permanent if not permanent basis, having little hope of a foreseeable return (Myers, 1997 p.167).

Problems caused by environmental degradation, especially due to climate change, abound in Sub-Saharan Africa. Climate change was the single most destructive episodes in human history. ‘If we go back to history, we remember when the black-death plague killed so many people’ (Lopes, 2013 p.1). According to Tadesse (2010) “Climate change has been identified as a leading human and environmental crisis of the 21st century. The problem of understanding climate change (or global warming) is one of the major challenges confronting African people, their governments and the African Union (AU)”. Another catastrophic aspect of climate change in Africa is gully erosion. According to Valentin C. et al (2005)

[f]or the farmers, the development of gullies leads to a loss of crop yields and available land as well as an increase of workload (i.e. labour necessary to cultivate the land). Gullies can also change the mosaic patterns between fallow and cultivated fields, enhancing hill slope erosion in a feedback loop. In addition, gullies tend to enhance drainage and accelerate aridification processes in the semi-arid zones.

Managing a Serious Environmental Problem in western Kenya

2.1. Introduction

Being in a research team of experts from different backgrounds helps to promote one's vision. I was part of a team to study the **issue** of gully erosion in Agoro West Location in Nyakach, Kisumu County. From the beginning, as a social scientist, I was deeply concerned with the **effect** of gully erosion on the daily life of people in the study area. Examples of issues that seriously affected my conscience, among others, were:

- a) Destruction of the road network in the study area
- b) Destruction of homesteads in the study area
- c) Destruction of vegetation and food crops in the study area
- d) Continued gully and soil erosion in every rainy season
- e) Humans and domestic animals falling into the deep gullies and die in numbers
- f) Flash floods along the gullies sweep away people downstream
- g) Etc.



Picture 1: Homesteads facing imminent collapse.

In the case of a homestead facing imminent collapse due to oncoming gully erosion, what are the social concerns involved? The gully is hardly 100 metres from the fence of the homestead, which discipline is responsible? Is it Political Science, Soil Science, Physical Sciences, or...? My answer is that this is an interdisciplinary issue, with the first aim of saving the lives of the people and their property.

2.2. Situation Analysis

In the absence of a clear policy approach to different environmental disasters, Kenya is one country that is always vulnerable to sudden disasters. The seriousness of this phenomenon has been ably described by Opondo(2013 p.453). Future rainfall projections for Kenya up to the year 2030 broadly indicate that there will be increases in annual rainfall, with highest amounts expected in western parts of Kenya around Mount Elgon, Elgeyo Escarpment and Cherangani Hills.... If these projections are accurate, there are likely to be far-reaching effects on the intensity and frequency of floods in the region



Picture 2. Neglect of Resources in the Community.

Picture 2 gives evidence of a water development project that was “abandoned” after construction. The question that a curious person would ask is: Who owned or owns the project? Was the project owned by the Government, who paid for the construction, the scientist who did the construction or the people that it was intended to serve? The way development projects are conceptualized in Kenya leaves one crucial issue unclear: OWNERSHIP. There are very many examples of failed development attempts where some people take off to become environmental refugees and others, such as the poor, disabled and the aged assign their future to the dictates of nature.

The seriousness of this environmental destruction in this area begged for understanding of those cultural factors whose outcomes are human activities that may have an impact, either negative or positive, on the process of gully formation and land degradation. The human factors included:

- a) Social structure
- b) Living style
- c) Cultural aspects

2.2.1. Social structure

Rural communities have been viewed by social scientists as places with highly cohesive social relations, law-abiding residents, low tolerance of deviance, and hence, lower rates of crime (Li 2011, p.64). This view has not been proved right, and is why most rural development projects have not succeeded in Africa.

Rural development projects cannot succeed in Africa because the “developmentalists” hardly take their time to understand the societies in which they implement their projects or do their research. Understanding the role of society in development is important. According to Urry (1998 pg. 33). “[S]ociology as a specific academic practice developed out of the intense conflict between nature and society which reached its high point during the later nineteenth century within western Europe ... Nature was viewed as and degraded into a realm of unfreedom and hostility that needed to be subdued and controlled. Modernity involved the belief that human progress should be measured and evaluated in terms of the domination of nature, rather than through transforming the relationship between ‘humans’ and ‘nature’”.

It is widely acknowledged that past rural development projects have failed to raise living standards significantly in African rural communities because they have typically adopted centrally driven, top-down approaches, often failing to appreciate the skills, perceptions, knowledge and aspirations of those whom the

programmes are designed to assist. It has been assumed that development programmes and projects implicitly embodied objectives of poverty reduction and that positive progress would be achieved through the process of 'trickle down' from richer to poorer regions and communities but often without positive outcomes (Bins and Nel, undated). Community development, particularly in poor regions and among poor communities means that the community itself engages in a process aimed at improving the social, economic, and environmental situation of the community. *The community is both the means and the end* (Cavaye, undated my emphasis)⁶. This is the sociological understanding of necessary conflict in society. According to Lewis A Coser (1957, pg. 197-198), "Conflict within and between groups in a society can prevent accommodations and habitual relations from progressively impoverishing creativity. The clash of values and interests, the tension between what is and what some groups feel ought to be, the conflict between vested interests and new strata and groups demanding their share of power, wealth and status, have been productive of vitality".

2.2.2. Living Style

Lassiter, referring to Nyasani argues that "African, Asian and European minds are products of unique "cultural edifices" and "cultural streams" that arose from environmental conditioning and long-standing cultural traditions. Within the African cultural stream, are psychological and moral characteristics pertaining to African identity, personality and dignity (Lassiter, undated). Inherent in the African mind are sociality, patience, tolerance, sympathy and acceptance (ibid). That is why it is important to understand the similarities and differences between African, Asian and European mindsets as far as living style is concerned.

Africans, in rural areas still live in homesteads and houses in a typical homestead are arranged in a particular cultural way. Culture in this case, is a process that people have lived through and as well as a stage people have reached in the process, over time and in place. Any development intervention that does not take culture into serious consideration is bound to fail.

Farmers or Gardeners?

My understanding of "farmer" in Kenya is a person who lives in one place, practices farming professionally, and as full time business and gets support from the Government. The famous colonial farmer was a perfect example of a farmer in the western conventional sense. However, farming as a business could not take off in Kenya because of settler colonialism, which came up with a number of destructive policies, the chief of which was known as land consolidation. Land consolidation was chiefly meant to eventually see an end to the African traditional and communal ownership and use of land. The native population was supposed to keep fighting for inheritance rights to small pieces of plots forever. This has resulted in a permanent state of instability in Kenya from Independence in 1963 to date.

What we call farmers in Kenya are not farmers, but mainly a residue of villagers who eke out life from the small remnant pieces of ever diminishing plots with maximum dependence on the "hoe culture". They are residual because they are the vulnerable (who depend on non-existent social protection) or internally displaced, the remains of environmental refugees. In such a context, researchers should not talk of "farming systems" but should talk of something like subsistence native gardening. But within the doctrine of western social research, the delineation of major farming systems provides a useful framework within which one can examine agricultural development strategies and interventions (Garrity, et al. 2012, p7). In classifying African farming systems, one could take note of the following factors; first, "the available natural resource base, including water, land, grazing areas, forest, climate, particularly length of growing period, and altitude and second, the dominant pattern of farm activities and household livelihoods including field crops, livestock, trees, aqua-culture, hunting and gathering, processing and off-farm activities" (ibid.).

It is also important to take into account the main technology used, which determines the intensity of production and integration of crops, livestock and other activities (ibid.). For example, traditionally, stones were used to grind grain and tubers (millet, cassava, yams, etc) to produce flour for *ugali*. With the introduction of milling machines and the change to maize flour, the intensity of production is higher and more commercialized. It should be noted that most traditional grains and tubers are “coming back” to food tables, mainly because of their “zero” sugar content.

We therefore need to remember William Allen in his monumental study of African farming (The African Husbandman, 1965), who said "We must try to see the situation through the eyes of the farmer, and put aside for the time being our own preconceived ideas, prejudices, and conceptions of good land-use, which derive from very different societies and environments." (ibid. p.2 my emphasis).

Policy for Sustainable Management of Environmental Problems.

3.1. Introduction

Seeing the situation through the eyes of the gardener means working with all the members of the community to look for a solution to a particular environmental problem in a participatory way. That means policy making from below, i.e., social policy. Quoting Julius Nyerere (1973), Mulwa (2010) argued that ‘people will only develop themselves’ “by what they do; they develop themselves by making their own decisions, by increasing their own knowledge and ability and by their full participation as equals”.

‘At its most basic, policy is “a course or principle of action, adopted or proposed by a government, party, business or individual” The term is used in many different ways, varying from institution to institution, organisation to organisation and sometimes within institutions and organisations as well. It can be hard to pin down, but there are some central features common to all good policy; first, it states matters of principle, second, it is focused on action, stating what is to be done and by whom, and third, it is an authoritative statement, made by a person or body with power to do so.

Above all, good policy is a tool which makes administration, *governance or management* easier, and allows people to get on with the organisation’s core business more efficiently and effectively’ (emphasis added) (Sydney University, 2012). The main social development problem in Kenya is that it has not been exposed to policy in her development. Successive administrations have continued with the ‘developmentalist’ approach, even in dealing with issues so sensitive as environment. Among the many environmental problems facing less developed countries, soil erosion has the most serious economic consequences. If allowed to continue at current rates, soil loss will reduce many countries’ capacity for agricultural production (Southgate D. et al. 1984).

It is not easy to successfully deal with the problem of environment in rural Africa, especially in the absence of policy. It is now quite clear that the African context is unique, in its geography, agro-ecology, history, politics and culture; and it is immensely diverse. This will require bold but original policy initiatives, and new ways of organizing and governing the innovation process, from upstream research to downstream implementation...in order to enable innovation that faithfully serves the needs of the majority (ibid p 3). The agrarian structure also plays a crucial role in shaping the speed and spread of rural development. An outmoded, in-egalitarian agrarian structure is not merely a serious impediment to rapid rural development, but also the principal cause of distorting the results of development (Appu, P S, 1974 pA73). “The social structure today is ruled by an economic principle of rationality, defined in terms of efficiency in the allocation of resources; the culture, in contrast, is prodigal, promiscuous, dominated by an antirational, anti-intellectual temper” (Bell, 1972 p.13). The character structure inherited from the nineteenth century - with its emphasis on self-discipline, delayed gratification, restraint- is still relevant to the demands

of the social structure; but it clashes sharply with the culture, where such bourgeois values have been completely rejected - in part, and paradoxically, because of the workings of the capitalist economic system itself (ibid. p 13-14) on which political modernization is based.

The experiments in political modernization and administrative reform that flourished in the 1960s have produced political hypertension and administrative disillusionment (Montgomery 1979 p58). Some of the problems currently facing policy makers are; public suspicion of bureaucracy, increasingly informed public and complexity of social problems. The public suspicion of bureaucracy is understandable. For example, the public in Kenya has rejected centralized authority located in the national capital.

3.2. Indigenous Knowledge and Cultural Life.

Every community in Africa has got its own indigenous knowledge. Indigenous knowledge is herein defined as “a cumulative body of knowledge and beliefs handed down through generations by cultural transmission about the relationship of living beings, (including humans) with one another and with their environment”. (Gadgil, et.al.,1957). Of importance for research on ecosystems in East Africa is respect for indigenous knowledge, beliefs and customs of native communities. For example, around two centuries ago, River Nzoia, which was very narrow by then, was the only source of water for many communities around.

This was also when struggle for resources, such as water, or land for grazing and residential space was very prevalent. For fear of attack by hostile clans, people used to live in big villages by the side of the river. These villages (called *gunda bur*) were surrounded by moats as protection from enemies. Traces of some of them, such as *GundaRabolo*, *GundaChunga* can be found along the river in Komenya, Siaya County. At least, two important indigenous tree (*ober,siala*) are still important to native life in Kenya.

The lesson we are learning here is that before one begins on research on any aspect of land use in a village or community, it is important, first to understand the socio cultural, economic, political, religious, etc. factors that determine daily life in the village. A major environmental problem affecting daily life of people along the river Nzoia basin is floods.

4. Perennial Floods and Household Food Production along the River Nzoia Flood Plain in Western Kenya.

4.1. Introduction.

According to Paul R. Epstein (1997),

There are many determinants of health and well-being, and they can all interact with one another. Human biological and psychological factors come into play on a personal level, but ecological and global systems are also involved, as are economics and access to health care, which determine the social vulnerabilities to disease. ... Environmental conditions, interacting with the biology of disease agents, can exert profound effects. Changes in how land is used affect the distribution of disease carriers, such as rodents or insects, while climate influences their range, and affects the timing and intensity of outbreaks.

Flooding is the most common of all natural disasters globally and causes more damage in terms of loss of life and damage of property and economic activity (FEMA 2000). Unfortunately it is predicted that the frequency of floods is likely to increase with the effects of climate change. According to the Intergovernmental Panel on Climate Change (IPCC, 2007), increased risks of floods and climate variability due to climate change have been anticipated. Rainfall variability has been observed in sub Saharan Africa with rainfall decreases in the Sahel and increases in East and Central African Region (Opondo, 2013). Kenya is one of the sub- Saharan countries that are expected to experience unexpected weather patterns

which includes flooding (World Bank, 2009). “Developing countries tend to suffer more from the impact of climate change and variability, yet they are least able to adapt to new climatic conditions. Vulnerability thus manifests itself in poorer countries and communities due to a lack of resources or entitlements and lack of capability to respond or adapt to climate variability. It should be underscored that the ability to adapt and cope with climate variability hazards depends on economic resources, infrastructure, technology, and social safety nets”.

4.2. Climate and Food Security

Floods limit peoples’ ability to replant after the flood waters recede either because the cropping season is often almost over or the necessary agricultural support is unavailable (ALNAP and Pro Vention, 2007). In Opondo (2013, op. cit.) it is reported that a majority of farmers experienced a reduction in food production due to flood that inundated the land and washed away their crops a situation which consequently resulted in food shortage and higher food prices as old as River Nzoia owing to its location as a low lying with flat terrain, which finds the river in its senile stage; hence flooding hazard is unavoidable. The frequency has tremendously increased due to increase in the population exposition to the flood hazards as human settlements and crop farming encroaches the river plains, thus high vulnerability (Makhanu, 2005).

The lives of many rural Africans are often characterized by serious economic uncertainty. Because of gender inequalities inherent to many African societies, women are struck particularly hard by economic crises (Meeker and Meekers, 1997). First of all, this is particularly relevant in the process of making use of climate information with respect to gender inequalities at local rural levels. Making the maximum use of climate forecasts has many issues, such as the problem of targeting the users, especially at the local level (Washington and Downing, 1999). This is because use of native knowledge in climate information almost always carries with it cultural and patriarchal underpinnings. Among the Luo of Western Kenya, for example, in a homestead with many households (women with their own houses and children), the first wife (*mkaye*) is the one who is supposed to first “take the seeds out of the homestead” when the first rain falls during planting season.

Secondly, in situations where climate data is a preserve of the Government or Ministry concerned, reaching the rural vulnerable poor could be especially difficult (Washington and Downing op cit.) This is the truth in the study area in Western Kenya, where farmers generally do not have access to rainfall or weather information for very many reasons. Thirdly and most painfully are the maladaptive responses and false alarms (op. cit.), where the climate information, not considered as public good, and nobody carries the responsibility of not being aware of the latest predictions. False alarms are also frequent, especially in Western Kenya, because of erratic rainfall due to climate change.

5. Conclusion

The confusion over the nature of the subject matter of the social and behavioral sciences and the consequences over what should be studied and how. In spite of the confusion, developmentalists have argued that development is a continuous sociological process with sustainability as the backbone process. The complexity of issues resulting from disruption and protection of the environment are complex such that an interdisciplinary approach would be most appropriate in addressing them. When environmental consciousness is considered as a component of development then it must be treated as every other aspect of development.

Development as a sociological process need to be institutionalized and accorded policy support to enhance legitimacy and acceptance by the social beings the very much of whom are the target. This is one way of promoting sustainability. Assumption that secularization, globalization and economic development will have a trickle down/ ripple effect is off target. These processes have instead created distinct groups of the fortunate and the less fortunate, the latter of whom are continually vulnerable to all manner of misfortune. Problems caused by environmental degradation, especially due to climate change abound in Sub-Saharan Africa, such as gully erosion which has not been managed and is a common occurrence in vulnerable ecosystems in western Kenya. I fully agree with Lockie Stewart (2014) that “[t]he goal here is not to develop a modest applied agenda for policy-relevant social science, but to make the social sciences “bolder, better, bigger and different.” What is envisaged are social sciences capable of: reframing environmental change as a social process; influencing policy agendas and participating in real-world problem-solving; engaging social scientists in the challenges of global environmental change; and ensuring reflexivity in the practice of social science”.

Egalitarian structures and processes are requisite in the quest for development in order to ensure sustainability. Without these there is a consistent reversal of any gains made which are usually manifested in the widening gap between those who benefit and those who are left behind. Equally it is important to ensure inclusivity and ownership of these processes to make foundation for sustainability. Many actions targeting environmental conservation and management fail to yield fruit due to lack of ownership by and inclusivity of the target communities.

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