

Water use in an African setting: history, culture and perception as a barrier to sustainability¹

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Abstract The culture debate in Africa, has traditionally been the domain of professionals in the humanities and social sciences. However, in the light of current development problems, scientists have become party to the discussion since issues raised in these fields have a bearing on scientific and technological advancement. In the area of water as in other aspects of development, the balancing of indigenous peoples' outlooks, philosophies and worldviews with modern technology and environmental concerns has not been successful. Limitations to water resources development in the country of Sierra Leone, West Africa, for example, with over 200 years of attempts at modernization can often be traced to cultural norms. Historically, poor policies, western based educational mindsets, lack of political will and awareness are also contributing factors. Paramount to this debate, also, is discussion over the extent to which researchers from Africa recognise their important role as facilitators between synergising modern, western and non-western, traditional, holistic technologies towards sustainable resource development.

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"Water is the place from which all beauty and blessings flow...

*We are engendered by water, nurtured by water - water is mystical space because it is the medium of love and life before life."*²

Sande religious philosophy, Sierra Leone

INTRODUCTION

The concept of sustainable development, widespread in the nineties, came out of increasing awareness of adverse effects created by high technological development on our planet. There continues to be much debate over a precise definition for sustainable development but generally, all encompass the idea of conserving the resources of the earth for the benefit of future generations. African countries like many others are failing to meet these goals. Africa has acquired a legacy of environmental degradation and poor policy on natural resources management largely from large scale agricultural ventures and deforestation for timber during the colonial period. The perpetuation of slash and burn agriculture is also a contributing factor.

Yet, the emerging holistic or ecological "new" philosophy of science and the notion of sustainable development have long been recognized among indigenous African groups as shown in ethnographic studies on the Dogon of Mali (Michel Huet, 1978). Rituals performed at the start and end of initiation ceremonies, times of sowing and harvesting, are man's/woman's way of appeasing Nature for mankind's part in the degenerative process of the earth. It is our responsibility, they believe, to maintain,

²Boone, Sylvia Ardyn Radiance from the waters: ideals of feminine beauty in Mende art. (New Haven and London: Yale University Press, 1986), pp 107.

enrich and take charge of the evolution of the universe - sustainable development at its best.

The traditional technologies associated with these worldviews are rarely acknowledged as sources of scientific methodology, occasionally recognised after having been seriously damaged by imported ideas of development. This lack of understanding and possibly respect for these systems by African policy makers, continues to be a major setback in development efforts. Further, indigenous populations live directly off the land by subsistence farming, hunting and gathering. They not only account for the larger part of GNP of most countries through agricultural production but are key players in the environmental management and conservation arena.

The idea that more attention must be paid to indigenous methodology in Africa was documented as far back as 1881 by Blyden. Although frequently noted, its implications have not yet been fully grasped. Agenda 21 stemming out of the Earth Summit in 1992, did reemphasise the importance of broad social participation (including indigenous people, farmers and women) in decision making processes. The results of this recognition are yet to be seen. Meanwhile, two separate "Africas" continue to operate largely along dichotomous lines. Traditional Africa comprising 70 percent of most national populations, struggles to survive in spite of continuous attempts at modernization and technology transfer.

It would appear, therefore, that a connection is not being made between similar aspects of modern and traditional development. As Huet (1978) has so clearly summarized:

"Nowadays everybody is talking about such matters as cotton crops and coffee processing, of vegetable oils and of foreign markets, of towns expanding into great cities. Such things form the present day reality it is true; but the reality must not be allowed to conceal the deep and fundamental reality of Africa, this fundamental Africa which has recently been in eclipse, but which nevertheless retains the firm conviction that she must keep alive her own origins and remain true to them."(1).

Sierra Leone, West Africa, shown in Fig. 1 provides a good example because it represents over 200 years of western style management and development efforts in Africa. Yet it still faces obstacles with technology transfer and modernization in the area of water and other resources. The most commonly cited reasons for failure in areas of science and technology focus on financial, technological and management constraints. However, historians and anthropologists show how historical and cultural factors also play limiting roles. Regrettably, this information would not be available to scientists on a routine basis for use in planning.

At present, the country is embroiled in internal conflict which anthropologist Paul Richards (1995) attributes to a political youth culture which has evolved out of the need *"to address the paradoxes of peripheral modernity, physical hardships associated with exploitation of forest resources, and the violence of diamond mining."(13)* Furthermore, traditional livelihoods like subsistence agriculture, fishing and hunting are land and water based. Conflicting perception on use and sustainability is an age old and continuing problem. As a consequence, animosities result which are part of the root cause of many present day setbacks. Water, a most vital resource is also at the heart of conflict. Case studies in the area of water resources development presented below show how historical

and cultural factors have hindered project success. The multidisciplinary nature of the data required for drawing up and implementing realistic and sustainable policies in this field become apparent.

TRADITIONAL ATTITUDES TO WATER USE AND CONSERVATION

From the traditional viewpoint, water is important for domestic use and agricultural production. Agriculture, however, generally follows a rainfed based cropping system, although small scale watering of crops might be carried out during dry periods. Dam construction and hydroelectric schemes, irrigation and drainage systems and wet mining on the other hand are part of modern day water policy in Sierra Leone.

The problem of water control in swamp rice cultivation

Artificial water control in swamps to produce rice has been part of Sierra Leone agricultural policy since 1921. Culturally, rice and its production is a fundamental and integral part of Sierra Leonean life. It is a staple, key item of sacrifice to the ancestors, dictates the division of farming family labour and its farming operations have inspired the movement of dance. Although swamp rice cultivation is the norm in coastal and tidal areas, upland rice farming is still practiced in the greater part of the country. Surveys by Richards (1985), have revealed that the labour requirement for swamp cultivation with water control methods, greatly exceeds that for both indigenous swamp methods and upland cultivation. Further, the potential for year round utilization of swamps with water control structures disrupts the well organized system by which communities operate. Harvest celebrations, rites of passage, weddings, hunting and gathering, fishing, building

construction, local court sessions, spinning cotton and weaving are all essential to customary life and fit into a specified timeframe.

Indigenous methods of swamp rice cultivation were well established by the start of the slave trade, when slaves from Sierra Leone were in great demand in the rice fields of Georgia and Carolina, U.S.A. for their agricultural skills. In addition, documentation of major swamp rice production by the Modu family, rulers of the Northern River States from the early 18th to 19th century (Skinner, 1984) and 19th century Temne farmers (Petch, n.d.) can also be found.

In 1921, an Indian irrigation instructor A.C. Pillai was brought to Sierra Leone by the administration, to advise on rice growing in coastal swamps at the mouth of the Scarcies river. He found a situation in which the local people had adapted their farming methods to take advantage of the natural conditions of fertility and irrigation potential in these ecologies. Rice yields were much higher than he had seen in India where both artificial water control and fertilizer application were practiced. In the Annual Report of the Agricultural Department for 1922, he wrote:

"On the whole people are well trained in rice planting...All are agriculturalists. Everyone in this tract knows cultivation work thoroughly...If it is made known to the rice growing public of other countries that the Africans are getting up to 4000lb in an acre of swamp without tith, without manure, without weeding, and without artificial irrigation and lastly by continued cropping for over thirty years, some will doubt the truth of the statement. But I submit as I myself did the work and saw the crop from planting to harvest.."(Appendix A)

In spite of the success with his rice growing project, he referred to the "social and political codes" which killed the desire to pursue agriculture as a profitable business venture or to gain material prosperity. These codes have been defined by Abraham (1994) as *"levelling mechanisms in the traditional system"* (38) which include kinship obligations, sanctions against the wealthy and ensuring political or social status through the exchange of economic goods. As such, Pillai expressed doubts that the populace could be enticed to produce more than was necessary for their immediate needs.

This very important aspect of his report was ignored and the Department of Agriculture chose to take an optimistic viewpoint based solely on statistics. The administration even introduced compulsory labour to clear swamps for rice cultivation in 1924. In addition, a wartime measure was introduced which demanded *"that every male inhabitant of the Protectorate produce annually two bushels of rice for sale"* (Saylor, 1967, 77). This upbeat mood continued and in the Annual Report of the Agricultural Department for 1927 it was confidently stated that *"there is little doubt that people will grow increasing amounts of swamp rice without much encouragement from us."*(1-2)

The extension of swamp projects continued after World War Two when the Inland Swamp Clearance Scheme was initiated. It not only involved forced labour but made the grave mistake of usurping traditional ruler's rights by tampering with the entrenched and "sacred" Land Tenure system. This system, operating in provincial areas, is primarily dominated by the patrilineal line of descent headed by the chief. It controls

how, and by whom land can be cultivated. The following action was taken by colonial authority, as recorded in Saylor (1967):

"After clearance, the land was divided into lots of approximately one acre, and those tribal members possessing a claim to the land under customary land rights were allocated as many as five units. The cleared land was allotted to applicants deemed qualified by the agricultural officer. Rent was established by and paid to the native administration. The lessee was prohibited from pledging the land, and any farmer could be expelled from his farm if he failed to farm his land to the satisfaction of the agricultural officer, who prescribed the varieties of crops to be grown and the final date of planting."(77-78)

These forceful measures did give rise to a period of increased rice production and between 1931 and 1955, the country became a net exporter of rice. Since then and particularly in the last 15-20 years, various FAO and World Bank agricultural projects have continued attempts to move rice farming from the uplands to the swamps. Swamps have been developed under various rural and agricultural development projects which have provided funds to cover farming implements, seeds, storage facilities, and agricultural extension officers to impart technical knowledge. The goal was that owing to improved yields, loans would be recovered and farmers make healthy profits. In general objectives have not been met. Ventures continually fail regardless of inducements. Today many of these lands have been abandoned and are typified by clogged drainage systems and high iron toxicity.

Two standard responses are given by farmers when asked about their reluctance to participate in swamp development schemes. The first is that swamp conditions are not conducive to work. Dampness, parasites and the difficulty of clearing swamps of large trees and stumps are major problems encountered. Secondly, they will tell you that generally, they prefer the taste of upland rice. According to Richards (1985), however, other substantial reasons for the poor success rate of water control schemes include the patronage-clientelism political culture widespread in Sierra Leone and the Land Tenure system. Patron-client relationships are characterised by favouritism, partiality and dependency. Patrons, therefore cannot be relied upon to disburse loans for agricultural implements, seeds and fertilizers, fairly. Thus the intention by project administration of fostering community participation by involving local authority, often backfires in the face of cultural norms.

The Land Tenure system it is believed, kills incentive, does not foster a sense of security and perpetuates the patron-client syndrome. Although it was recommended in the 1974/75 National Development Plan that the system be modified, this has so far not been done. Disregard for local opinion during project planning and memories of the forceful methods employed during the early implementation of swamp schemes to achieve high yields, have also likely aborted voluntary cooperation. As Hardin (1993), has pointed out based on anthropological studies in eastern Sierra Leone, in complying with the value systems of a communal lifestyle:

"non-participants or those locked out of relations of complementarity, are not necessarily bound to carry out decisions that they have not contributed to and that the withdrawal of

labour or other forms of noncompliance is a primary way of showing dissatisfaction."(235)

In spite of all this historical and anthropological documentation, conferences and workshops continue to be convened and projects with lofty goals implemented in the hope of promoting swamp cultivation.

Why groundwater may not always be the right choice

Additional examples exist in the area of domestic water supply. Hydrological studies often point out the value of exploiting groundwater where financial resources are limited. Also, in mining areas where surface water is likely to be contaminated, science dictates the wisdom of utilizing underground sources that may have benefited from some filtration. Yet traditional perceptions of water use often conflict with this practical scientific viewpoint. Wells provided by rural water supply programmes are often abandoned in favour of traditional surface sources. Associated educational programmes on health and sanitation in favour of well water are generally viewed with skepticism (per. communication).

In a country like Sierra Leone with an average annual rainfall value of 3000mm and a six month wet season, streams and swamps contain water for more than half the year. So even where wells are present in villages, any surface water body in close proximity to a settlement will be central to life. The waterside has both social and religious significance. Daily activities like bathing, laundering and fishing are all carried

out here and involve interaction between mostly women and children under supervision of their mothers.

The notion that the social and spiritual aspects of interacting with others during communal water use, should be sacrificed on the basis of water quality that cannot be perceived as a tangible thing is likely a foreign concept. Further, any health effects from drinking contaminated water can likely be explained away by more easily understood phenomena. The issue of polluted water has been raised in the past (Waldock et al, 1951) and the assumption was made that local inhabitants must have acquired immunity to waterborne diseases.

Yet (Wohlwend, 1978) has recorded that water quality issues from a traditional perspective like potential contamination from the gallbladder of a dead crocodile are closely monitored and acted upon. Designated bathing and laundering areas, also exist in many communities. In addition, springs and rivers considered sacred and preserved for ritual and religious ceremonies are protected by strict rules on use and maintenance. Boone's (1986) study on the Sande female society of Sierra Leone reveals the symbolism of water and the sacredness of the river depths where it is believed that "*spirits enjoy a divine existence of beauty and peace.*"(50) Ceremonies are carried out at the waterside and beauty and cleansing rituals must be performed there daily by members of the society. "Contaminated" surface water sources, therefore, become a secondary issue to religious beliefs and faith.

STRADDLING THE FENCE - THE ROLE OF THE AFRICAN SCIENTIST

In the light of the above information, the task for Appiah's (1992) "Europhone" African scientist, product of two cultures but predominantly operating as a professional along western lines is phenomenal. Many are still struggling to find the right balance between modern and traditional values, essential for a meaningful contribution to African development. The result of continuing cultural conflict, is the perpetuation of introduced, basically unmodified, value systems and policies that are largely ineffective as far as the majority of African populations are concerned.

Ihonbvere (1989) is of the view that the difficulty in resolving cultural conflict, is because the educational training that most African professionals have undergone has by and large produced *"a mentality which discriminates against indigenous systems, products and ideals while glorifying anything foreign."* Compounding this problem, is the fact that even within the context of a western framework, development aspirations are not being met. As a group, African researchers face many obstacles in the quest for innovation and initiative. The cost of western science is prohibitive to most developing countries. The effects of poor economic conditions, weak resource policies and a lack of political will concerning research and documentation have killed incentive.

Comprehensive databases necessary to support continuous development of science and technology do not, therefore, exist. Further, Aid agencies are contributing to the problem, because of their own preconceptions and poor guidance by African nationals as regards to the local sociological and cultural environment. So what does the African scientist do?

There is no denying the fact that in the modern world, western science and technology shape the way we live. Mastery of this technology and the ability to

manipulate it form the basis of socio-political power. It divides the rich from the poor, the powerful from the powerless. Science has an intimate relationship with culture. It both shapes and is shaped by the cultural norms of the people who practice it. The choice of what type of knowledge science will pursue is determined by the priorities of those who fund and carry out scientific research. By and large, an aggressive, male-dominated and Eurocentric ethos dominates the approach to technological innovation if not the personal creativity of the scientist. This mentality, thus becomes part of the Europhone African psyche. That this approach may not be conducive to a large part of the earth's inhabitants may be evident from failures in technology transfer and underdevelopment.

Since there is no turning back, the Europhone African, nevertheless, has the responsibility of taking Africa into the 21st century, despite the many obstacles. This responsibility is not limited to Africans on the continent but those based in the western world who may infact have greater access to material on Africa. In addition to digging up existing technical data for review and analysis, traditional technologies and methodologies on resource use handed down by word of mouth from one generation to the next, must be documented. The oral tradition of Africa is somewhat like shifting sand. Knowledge, skills and expertise are culminations of a building process from generation to generation. Increased knowledge about the achievements, beliefs, values and what sustained peoples of the African past is the foundation to build upon. Appropriate development schemes can then be designed that will ignite the African soul, rekindle the African spirit and lead to progress. Armed with adequate data of a multidisciplinary nature, scientific innovations appropriate to the environment can be devised. Researchers can then be effective, acting as facilitators in synergising modern with traditional

technology. As Ayoade (1989) so rightly states, *"the search into the past, is not for cultural fossils but the search for creating new forms out of old inspirations which still possess artistic viability and social significance."*(4)

CONCLUSION AND DISCUSSION

Development efforts in the fields of science have generally focussed on acquisition of technology, manpower training and drawing up appropriate legislation. Regrettably, the need for more diverse information is often overlooked by policy makers and technologists trying to implement projects. Such an oversight is not necessarily a deliberate ploy on the part of the professional, but rather the fact that cross-disciplinary reading across the boundary of the Arts and Sciences is not a requirement, and is therefore not incorporated in the overall scheme. This deprives scientists and technologists of information essential to their work; primarily, the limitations to development imposed by the human factor. For example, knowledge of historical considerations that make indigenous people suspicious of outsiders or Sierra Leoneans representing what is perceived as outside interests; cultural factors which influence how well innovative ideas are received and adopted or valuable indigenous knowledge passed on; and lastly, how personality characteristics like trust, security, value orientation, affection on the one hand, and distrust and suspicion on the other, can have an important bearing on the quality of the data researchers collect at field level and hence the ultimate success of projects.

Opinions vary on the extent to which westernized Africans have been alienated from their culture (Turnball, 1962; Appiah, 1992). Ayoade (1989), takes an optimistic

viewpoint, believing that developing African countries still have a chance to compliment technocracy with culture because departure from culture is so very recent and short. He further stresses the importance of a well articulated cultural policy as culture is recognized even in the industrialized world as a counterweight to technology. In his words, *"the traditional and rural which constitute autochthonous culture will bestow the modern and urban culture something which they have often lacked i.e. a human dimension."* (4)

Winning the trust and confidence of the rural person who is the final implementor of most policies related to land and water development is a major feat. Researchers in Africa can attest to the difficulty of obtaining accurate reported information at grassroots level. Knowledge is considered sacred amongst many African groups. Artistic talent and technological skills are a consequence of divine intervention and must only be passed on to those who prove to be worthy. Boone (1986), on her research in parts of Sierra Leone, refers *"to many demoralising and sometimes harrowing impediments"* (xvi) in the quest for data. Pertinent questions to be asked along the way are:

- a) How do indigenous African people perceive science and if science and technology have an intimate relationship with culture, what is a distinctly African science?
- b) What unique approaches to science have arisen in the African context on the continent or in the diaspora?
- c) What role can scientists or researchers from these regions drawing on their indigenous cultures play in achieving sustainable development goals on a global scale?

In the midst of gaining their own understanding, scientists serving as national counterpart to foreign experts on international aid projects, must carry out the function of guide and advisor on the local environment. Notwithstanding problems that commonly arise as a result of disparities in salary scales for equal or more work and a highhanded attitude by some experts, the final onus is on the national. Any losses due to poor working relationships are to his or her country.

Finally, political will, both on the part of developed donor countries and African governments, is essential to progress. Davidson (1974) is of the view that modification of existing systems and institutions will not solve Africa's problems. This he believes is manifested in the turmoil presently being experienced on the continent. As President Bill Clinton of the United States, pointed out in his address to the 52nd Session of the United Nations General Assembly in 1997, *"millions of personal tragedies the world over are a warning that we dare not be complacent or indifferent. Trouble in a far corner can become a plague on everyone's house."*(3)

Perhaps the World Bank's new commitment to inclusion as pledged by their leader, Wolfensohn at the IMF Annual meetings in Hong Kong, China on September 23 1997, may be the signal for gradual change to new systems better suited to the African environment. He acknowledged the fact that people just *"want a chance. They do not want solutions imposed from without. They want the opportunity to build from within. They do not want my culture or yours. They want their own. They want a future enriched by the inheritance of their past."*(5) Any change for good within this transition period will come from moral obligation, sacrifice and concern for the future of Africa's children. Only then will the words of Blyden written in the 19th century hold true -- that *"...when all is said and done by Europeans and Americans that they can do, the African himself [herself] is, and must always remain, the fittest instrument for the development of his [her] country."*(Blyden, 1887, vii)

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