

TECHNOLOGY AND AFRICAN VALUE SYSTEM

By

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Abstract

This paper investigates and examines the concepts, Technology and African value system - which are the African cultural heritage such as living tradition, valuable and precious wealth that need to be harnessed and toiled towards African development. However, it is observed that African Cultural Heritage is enviably rich full of inspiration and vitality, but it remains a treasure largely unexplored in her continued quest for integration into the globalization and ceaseless drive towards nation-building. Moreover, the effect of modern technological development on African value system is also something of great concern. This is an attempt to re-awaken African tradition and consciousness in order to unravel the **primary material and concrete beliefs of Africans. Also, its aims at understanding more about the African world. This work adopts a phenomenological approach in investigation. Some of the terms are defined in order to convey the exact meaning within which they are used in the context of the work. The link between technology and the traditional African values; and African values in modern African are examined.**

Key Words: Technology, Value System

Introduction

African cultural heritage has been maligned in many ways. Many overzealous Christians and Islamic enthusiasts have branded it as barbaric, primitive, unprogressive and unrevealed. Many modern men who are engrossed in the influence of science and technology believed that it is dead and useless religion which should be discarded and thrown over-board. In the same way, the fantastic and some parochial members of the so-called missionary religions, especially

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Christianity and Islam, always assert that theirs is, 'the only revealed religion' and what is obtainable in African value system and traditional religion is the worship of non-existent spiritual beings and idols. Nabofa, M.Y. (1988:92-93) asserts that; They often assert that the traditional Africa value system does not honour and worship the true God, therefore the religion should be wiped out of the surface of the earth, forgetting that most of their members go to African priests and diviners secretly in the night to seek solution to their problems when they are faced with realities of life. The practice of medicine, in its various forms, which is an aspect of this religion, also comes under serious attack by the practitioners of the orthodox modern medicine.

African culture heritage (value system) embraces all aspects of African life. It involves people's history, philosophy, poetry, psychology, medicine and health care delivery, ecology, various arms of the traditional government, ethics, economic and social activities, education, military strategies, mathematics (especially numerology) astrology, arts in its various forms and even including science and technology.

Therefore, one of the major aims of this paper is to find out how technology has influenced the African system and whether there are any values by which the African forebear or ancestors lived and by which present generation are living, and if there is any heritage from the past which is spiritually and morally suitable for today. In part, the essay aims at discovering what African actually know. Also it finds out how African beliefs have inspired their world-views and moulded their culture generally. Besides, this work gleans on emphasizing indigenous values and sustainable development as an overall appreciation of African cultural heritage. It informs that scholars and people can better comprehend the phenomenon of technology and cultural heritage by including those forces that support sustainable development. Africans need to develop a sense of ontological nature of value and of cultural lineage. Interestingly, African traditional value system in this new millennium is not a final product, stereotyped and fixed; therefore, it is to be reinvented everyday by Africans. In order to set the bearing right, using modernized technology to enhance this value system is necessary so as to achieve

optimum result. This work adopts a Phenomenological approach in investigation.

The African Value System

According to Longman Dictionary the word value is defined, 'as the degree of usefulness of something, quality in something which makes it helpful, useful or desirable, a standard or idea which most people have about the worth of good qualities'. This notwithstanding, the meaning is not explanatory enough. The word values refer to the attitude, beliefs, behaviours and actions that are cherished and acceptable standards of behaviours which each society expects that the members should abide by. Although, values differ from person to person and from one society to another, this is because social groups or human societies have various beliefs, attitudes and standards that form their value system. In view of this development, Falade, D.A., Akinde O.O & Adejube, (2009: 482) in their own perspective explicate the term value as, "a coherent set of attitude, behaviour and action adopted and, or evolved by a person, organization, or society as a standard to guide its behaviour and preferences in all situations". The concept is hereby used and utilized as a coherent set of African attitude, behaviour and preferences. Also the word value is used as an enduring belief that specific mode of conduct of African existence is socially preferable to an opposite or converse mode of conduct.

The Place of Traditional African Cultural Values

The interpretive exposition of values generated by traditional African societies covers many aspects of the African cultural life. Although, it is important to note that talking about African cultural values does not imply that by any means there are no cultural disvalues or negative features of the African cultures. There are, of course many of it. Hence, Gyeke, k., (2002:171).

Asserts that;

This is because some cultural beliefs, practices and institutions that are regarded as cultural values may be regarded as cultural disvalues by others. Or even some aspects of what one regards as cultural values may require some refinement. Nevertheless, however, traditions need to be evaluated. The main reason for focusing on cultural values here is that some of these cultural values require appropriate and necessary amendment and refinement in order to be

relevant to African modernity.

There is no community or nation in existence to which religion has not formed the basis of her life. There has always been a sense of belonging to God in Africa, as well as the basic belief that this world is God's world. In Africa, the belief is that God created the world and the whole affairs of the world are under his unitary control. African belief is that society is thus an ordinance of God, and every institution within society is therefore basically religious.

African people have various moral and societal values meant to regulate interpersonal relationship and to perpetuate the entire community. Africans have certain standards or norms to be observed. These standards or norms are meant for social cohesion and smooth running of the community. They are to prevent members of the community from becoming rebellious and thereby endanger the welfare of the society. In African society, there are a set of values that guide the behaviour of every member. Specific mention could be made of values such as hospitality, chastity before marriage, truth, respect for old age, covenant keeping, hard work and good character. **In African community there are proverbs, maxims used to inculcate social and moral values in order to regulate their interpersonal relationship. The following are illuminating examples from the Yoruba of Nigeria and Akan people of Ghana. (Examples of proverbs/ Maxims) as elucidated by Falade, D.E et. al., (2009:485-489):**

Respect and honour for elders: A i fi agba fun enikanko je ki aye o gun
(failure to give regards to other is fundamental cause of societal abnormality)

Regard and appreciation for one's family and benefactors: A ki i fi owoosijuweile baba eni (we should not point at our father's home with the left hand)

Self control and courtesy: Falanagbo tire, taraeni la gbo (Falana-a generic name, mind your business)

Virtues of forgiveness, harmony and peaceful co-existence: Bia kobagbagbeoroana, a konirienikanabasere (Unless we overlook the past misdeeds, we will not be able to relate)

Diligence and industry: Iserioogunise (Hard work is the cure for poverty)

Truth and honesty: Otitoki i sinaironii fi origbogbe (Truth does not make mistake,

falsehood lead astray).

Unity and cooperation: Ajejiowokankogberu de ori (One hand cannot lift a heavy load to the head)

Also, Gyekye (2002: 22-104), has it that;

From Akan people of Ghana (Examples of proverbs/Maxims)

Beauty: Beauty does not pay off a debt

Chief ship, People and Political Authority: it is when a chief has good counsellors that his reign becomes peaceful.

Children: There is no wealth where there are no children

Community: The reason two deer walk together is that one has to take the mote from the other's eye.

God: Goodness is the prime characteristics of God.

Humanity: Humanity has no boundary.

Immortality: When a person dies, he is not really dead.

Individuality: It is by individual effort that we can struggle for our head.

Knowledge: Knowledge is like a garden, if it is not cultivated, it cannot be harvested.

Morality: Life is mutual aid.

Parental responsibility: Absence does not bring up a child.

Personal responsibility: He who gets blisters from the hoe handle will not die of hunger. Only he who goes into the forest comes back with firewood. What one cultivates is what one harvest.

Virtues: Good character is a person's guards. An unpleasant truth is better than a pleasant falsehood.

Wealth: When wealth comes and passes by nothing comes after.

Wisdom: The wise person is spoken to in proverbs, not in words.

Wife: The beauty of a woman is due to her husband

Work: Treat your guest as a guest for two days; on the third day give him a hoe.

There is no other things you get out of laziness than poverty.

Apart from the above, another eminent example of African cultural value is on the use of symbols. Symbols are objects, acts, relationship or linguistic formation

that stands ambiguous for multiplicity of meanings. In traditional Africa, symbolism has found spontaneous expressions in several religious and secular processes among many different people of Africa. Nabofa(1994:4), states that; "These expressions could be seen in religious emblems, ideograms, icons, rituals, songs, prayers, myths, incantations, vows, customary behaviour and personifications." Symbols can be classified into the following groups: natural, artificial, communicative, artistic and ritualistic. In traditional Africa, symbols served several vital purposes. Apart from the obvious fact that they evoke in human beings deep emotions and easily spur and motivate them into taking definite actions. Besides, Nabofa(1994:13) opines that; Symbols achieve seven major broad-based goals: to maintain order and coherence for communication, preserving knowledge to be transferred from one generation to other, for expressing inner feelings and external truths, for remembering important events, as aids in mediation and for the promotion of spiritual development.

Traditional African Cultural Values in Modern Africa

Many cultural values and practices of traditional Africa discussed, however, can be considered positive of the culture and can be accommodated in the scheme of African modernity, even if they must undergo some refinement and pruning in order to become fully harmonious with the spirit of modern culture and to function most satisfactorily within the culture. These are some of the traditional African values that are fully harmonious with the spirit of modern cultures and as well function most satisfactorily and bring about sustainable development in modern Africa: according to Gyekye 2002: (171-178):

Humanity and Brotherhood: Traditional African cultures recognize the dignity and integrity of the human being as a creature of God. Our common brotherhood is intrinsically linked with our common humanity. There is only one universal family, to which all human beings belong. This family is fragmented, however, into a multiplicity of peoples and cultures. The recognition of all human beings as brothers in the light of our common membership in one human species is a lofty idea, that is, of great importance to the African people.

Communalism and Individualism: The value that the traditional African societies place on communalism is expressed in the sharing of a common social life, commitment to the social or common good of the community, appreciation of

mutual obligations, caring for others, interdependence, and solidarity. At the same time, the claims of individuality are recognized. African ethic, however, urges the avoidance of extreme individualism, which is seen as potentially destructive of human values and of the whole meaning and essence of a human society. Attempts are therefore made to balance communalism and individualism so that they can co-exist.

Morality: The morality espoused in both traditional and modern cultures, and societies of Africa is a social, non-individualistic morality. This kind of morality is held as enjoined by social life itself. There is a preoccupation with human well-being in the African moral thought and practice. The African moral system puts the ethic of responsibility above the ethic of individual right, even though the latter are also given due recognition. The importance of character as the engine of moral life in practice is stressed.

The Family: Marriage is considered as a valuable institution, for without it there would be no family, that is, the basic unit of social life. Without the family there would be none of the kinship ties that are essential to a comprehensive social life, with an intricate network of social relationships. Values associated with the family **include recognizing the responsibility to share life with a wife or husband and children in the nuclear family and with members from an entire lineage in the extended family, recognizing the need to have and to care for children, respecting parents, taking care of our parents in their old age and so on.**

Economic Ethic: Africans seek and put a high values on wealth, both private and family (clan). The right to, and the importance of private property are recognized in the traditional African economic system, where private ownership exist side by side with public command, do not control all the dynamics of the traditional economy. The traditional African society is a welfare state, functioning on the ethic of fair distribution. Everyone has access to the resources and goods of the community or state.

Chiefship and politics: In the political thoughts and practice of the traditional African society consultation and consensus are highly valued, for they are outstanding features of political decision-making. This practice allows for the

involvement of all the people in the political process. The chief who is the highest political authority, rules with the consent of and in accordance with the will of the people. In the actual exercise of power, the people in effect, are the sources of authority of the chief is based on a trusteeship principle that ensures his accountability of the people. Freedom of expression, of political opinion is appreciated and practiced. Misrule by a chief is not tolerated and can lead to his being disposed.

Human Rights: The most important values in which human rights are rooted are put into practices in the traditional African cultures. These includes individuality, personal responsibility, the dignity and integrity of every person, consideration of every person as an end in himself or herself and worthy of respect and equity of the moral worth of all people. Other rights that are acknowledged and protected include: the right to the use of lineage land, right to food and protection from hunger, the right to a fair trial and the right to own private property. These rights are fundamental to the social structure, customs and ethic of the traditional African society and do not need to be vociferously and belligerently fought for.

Knowledge and Wisdom: In the traditional African culture, knowledge is highly valued especially practical or empirical knowledge. This type of knowledge is based on observation and experience. Practical wisdom is most relevant in the reconstruction of the African society and the promotion of human well-being.

Aesthetic: Art in the traditional African cultures has both functional and aesthetical dimension. Beauty is seen not only in works of art and in the human figure but also in human conduct, in humanity itself and in a person's character. Among the criteria of aesthetic value and judgement are appropriateness and fittingness. For instance, music, dancing and even clothing must be appropriate to the occasion.

Technology and African society

There is a perspective which holds the view that African traditional cultures and/or value systems, unlike the Western ones, are inhibitive to and incompatible with scientific, technological, economic, and philosophical development and progress. Gyeke, (1997:27), attributes this incompatibility to the "intensely religious and spiritual nature of African traditional life", which he argues, "has discouraged

an expansion of existing practical knowledge of crafts and technologies such as those used for food preservation and herbal therapeutics through scientific enquiry and analysis. Which eventually stunted the growth of sciences"? He, for instance, argues that while African cultures appreciated the notion of causality. Which is crucial in scientific inquiry and explanation of natural phenomena, their religiosity led to explaining causality terms of spirits and mystical powers. This he argues, resulted in empirical causal accounts being abandoned and neglected in favour of religious inspired accounts.

The latter accounts, Gyeke argues, tend to see spirits or mystical powers as causal factors. Another stumbling to the development of science and technology within the African cultures identified by Gyeke is that of the manner in which knowledge of external world has been acquired. He argues that unlike in science, knowledge acquisition was not based on experimentation but was personalised through a strong element of secrecy. This resulted in such knowledge not being made available for further objective, public scrutiny and analysis in order to verify its conclusions. This veil of secrecy around it, Gyeke argues, results in the **possessed knowledge simply vanishing on the death of its bearers.** He illustrate this point by **making specific reference to the knowledge of potencies of herbs and other medicinal plants possessed by African traditional healers.** Considering this knowledge as the most secretive of them all, he argues in Gyeke (1997:28) that, "even if the claims made by African medicine men and women of having discovered cures for deadly diseases could be substantially referred to empirical causal explanations as "empirical causation" as they ask what-and how-questions, and religious-inspired accounts as "agentive causation" which ask who-and why-question.

Scientifically, those claims cannot be pursued for verification. Since their knowledge-claims were esoteric and personal. The desire to make knowledge of the external world personal has been the characteristic attitude of our traditional healers. in the past., Gyeke, (1997:29) opines that, "all such possibly credible claims to knowledge of medicinal plants just evaporated on the death of the traditional healer or priest. And science, including the science of medicine, stagnated.

It should however be noted that while Gyeke is critical of what he considers a lack of drive to pursue sustained scientific enquiry into knowledge of the natural world and lack of desire for knowledge for its own sake, he however acknowledged the existence and presence of technological and scientific capacity within African societies and their cultures or value systems. Gyeke, (1997:30-31) mainly attributes; Lack of drive to unlock and exercise that capacity on a sustained basis to the mindset often expressed in statements such as "this is what the ancestors said or did" or the maxims such as the Ghanaian Akan one that says "if you insist on probing deeply into the eye sockets of a dead person, you see a ghost" (this is an English translation) which says that curiosity or deep probing could result in dreadful consequences.

Such maxims, Gyeke argues, stunt the spirit of inquiry, exploration and adventure. Gyeke's view that African traditional cultures or value systems are inhibitive to technological and scientific growth, development and progress is shared by Robin Horton, (1997:327) thus:

Drawing distinctions between the African traditional cultures and western scientific cultures refers to the former as "closed" cultures and the latter as "open" cultures. By "closed" cultures or thought systems, he is referring to those cultures in which there is no developed awareness of alternatives to the existing, established theories or beliefs, In contrast, the "open" cultures are those that have a highly developed awareness of such alternatives. For Horton, an obstacle to progress within African traditional cultures lies in their reluctance to question the established beliefs owing to the fear that any threat to those beliefs could result in a horrific chaos.

This point was also echoed in Wiredu's comparative analysis of the African (traditional/folk) thought and the Western (traditional/folk) thought systems. Wiredu (1980:41) argues, "that any culture and/or thought system which is both non-scientific and non-literate (be it Western or African), is seriously handicapped. This, he argues, is so since scientific methods can only occur where there is a recording of precise measurements, calculations, and observational data i.e. where there is what he calls the scientific spirit and /or the spirit of rational inquiry. "he

argues, based on his examination of the conception of a person by the Akan of Ghana, which he found to be more interesting and imaginative than the Western philosopher's thesis, that while (such) folk thought could be comprehensive and interesting, the lack of discursive content in it remains a major drawback. Hence that, unlike the modern Western philosopher, who argues for his/her thesis, clarifies meanings, and responds to objections, the believer in traditional and /or folk thought usually responds like this: "this is what our ancestors said". Such response, Wiredu argues, only serves to block opportunities for further development even, technologically, Wiredu argues.

Challenges of Promoting African Cultural Values

The challenging of promoting African cultural values as elucidated by Babawale, (2011:8-11) are:

Activities of Western explorers, missionaries, traders and colonial administrators have resulted in the loss of respect for our traditional objects, symbols and rituals relevant of cultural identification.

Our collective and, or inaction have further dampened any hope of an immediate revival of the lost glory.

Haunted by her history of colonial and neo-colonial exploitation, economic pillage as well as decimation of her tangible and intangible heritage material resources, Africa is still at the verge of matching her cultural resource endowment with her development potential.

The cultural and artistic achievements of the Africa people in various fields of human endeavour, including science and technology, are attested to by the widespread cultural sites which are increasingly becoming object of systematic plunder, destruction, and illicit trade, aided by greed, ignorance and prolonged neglect.

The task before African scholars, particularly in the field of history and culture, is to commence the systematic recording, documentation, preservation and the use of oral tradition in the service of the owners' of the traditions and deploy them in addressing issues of common concern to all.

Prospects of African Values

In order to reclaim the humanity of African communities and assume the

rightful heirs of our founding fathers, there must be a conscious effort to assert African historical traditions and consciousness. We must explore Africans oral traditions and its prospects for economic liberty, natural integration, and stability. Africans need a psychological and physiological liberation. In doing this, they must draw lesson from Asia to where nature and environment are valued and celebrated. The challenge before Africans as individuals, institutions, government at local, state, national and trans-national is to rededicate to the appreciation, development and patronage of African technology, cultural resources and values.

It is high time, Africans identified with one another with good knowledge of relics of the endowment and versed in the history of various technological and cultural sites, Africans can only make gains rather than losses by investing resources in individuals with powers of management of the technological and cultural resources. African pride as continent lies in the values placed on her technological and cultural endowment, the inherent system of ideas as well as those values that define peculiar and group ways of life.

Placing premium on African technological and cultural endowment would earn the people respect, global recognition, international co-operation, development, and aid effective dissemination of African culture by projecting the best of her history./ it would naturally encourage the preservation of African heritage for future generations and for the development of knowledge and cultural understanding as being experience in other areas.

Case study

A successful post-harvest cassava processing technology - the mechanised grater

The technology

In Africa approximately 95 per cent of the total cassava production is used as food. Farmers and food processors market three main groups of cassava food processed products: dried roots, pasty products and gari (a granulated product). Gari is the most widely processed product due to ease of transport and storability. It is processed through peeling, grating, water expressing, and toasting of freshly harvested cassava.

The cassava garter

Traditionally, processing of gari entailed pounding cassava in a mortar with pestle.

Jones, W. O. (1959) state that, "Later, artisans developed a manual grater in the form of a sheet of perforated metal mounted on a flat piece of wood. But the efficiency of the hand grater was low because of the high labor input. In the 1930s, the French introduced mechanical graters in the Republic of Benin (formally Dahomey) to teach farmers how to prepare garri for export markets." Adeboye, R. O. and J. A. Akinwumi. 1990. Assert that "Later that decade in Nigeria, local artisans introduced and modified this mechanized grater, making it more labor efficient. . . . Initially, the mechanized grater spread slowly. In 1969, it was available in approximately 25% of the cassava producing villages in Nigeria. Later, from the most basic manual pedal operated equipment (with a capacity of about 30kg/hr.) through to motorized machines (with capacity exceeding 800kg/hr.). Grater can be found in virtually all major cassava producing villages in West African countries where cassava is processed into garri (i.e. Nigeria, Ghana, and Cote d'Ivoire. Benin, Guinea, among others).

Technology diffusion

Total consumption of Cassava in Africa doubled from about 24 million tons per year in the early 1960s to about 58 million tons in early 2000s. These increases have been supported by increased production arising from better control of pest and diseases, coupled with the ability to process cassava into garri technologically.

However, expanded cassava production and consumption has not been accompanied by commensurate research and development on post-harvest handling. Most government have focused their Agricultural development investment and policies on production and marketing of industrial crops (cocoa, cotton, groundnut, palm oil, and rubber). Aiming to raise tax revenues and generate foreign exchange. To redress this constraint, village smith welders, and mechanise have over refined the mechanized grater originally introduced into West Africa from France.

Most of the grater are owned by village entrepreneurs and operated by young men, who provide grating services to small holders for a fee based on the quantity grated. The quantity processed for a customer varies from one kilogram to several tons. In some instances, grater are mounted on wheels and moved to the

field s or homes of farmers who request the services. Maintenance service are provided by roadside mechanics welders. Therefore the diffusion of the grater has been a purely private sector undertaking involving the artisans, grater business owner and cassava producers. Its use has been augmented by increasing production of cassava, which has received strong public sector support. The dominant role of the private sector does not mean that the government in the cassava producing countries, have completely ignored the technology. For example in Nigeria. Idachaba. F.S. (1998). Has it that: In the 1970s, several government agencies were established to undertake research into the chemical, biochemical, and engineering/ processing of crops including cassava. The agencies include the fabrication Engineering and production company (FABRICO). Established in 1971; the products development agency (PRODA). 1971; the Federal Institute of Industrial Research, Oshodi (FIIRO.1975; THE RURAL Agro Industrial Development Scheme (RAIDS). 1981; and the African Regional Centre for Engineering Designs and Manufacturing (ARCEDEM). The cassava graters developed by these agencies achieved limited adoption because they were expensive and inconvenient compared to graters developed by village artisans. Especially problematic was the fact that they operated at capacities far in excess of the processing needs of the smallholders. As a result, many entrepreneurs who bought them were forced to modify them, or to abandon them altogether.

Value generated by the grater

It has been shown that the replacement of hand grating with the mechanized grater cut the cost of garri production in half - that is. 51 days of labour were needed to prepare a ton of garri by hand and 24 days by mechanized grater.

Impact

It has been shown that the rapid improvement in cassava product (garri) was possible because of the mechanized grater. The mechanized grater reduced the cost of making garri and significantly increased its profitability. Three lesson can be drawn from the success of the mechanized grater first. The important role of the private sector in sustainable technology uptake in sub-Saharan Africa cannot be overemphasized. Toward this end, new innovation being introduced should

endeavour where possible to integrate a private-sector driven diffusion process, especially when the technologies have high private benefits.

Second, well packaged simple component technology aimed at addressing existing needs within value chains will have high likelihood of success.

Third. The introduction of an innovation in a value chain requires a re-evaluation of the whole chain to redress emerging bottlenecks. The introduction and diffusion of the mechanical cassava grater has seen the labour bottleneck in cassava processing shift to the peeling stage. Mechanization of peeling will allow grater-entrepreneurs to own higher capacity grater that could permit them to exploit economies of scale, leading to reduced processing costs and higher incomes.

A Failed Cassava Processing Technology -Mechanized Cassava Peeler

The Cassava Peeling Technology

The first step in processing of cassava roots is often to remove the peel, which result in a great reduction of the cyanogen potential of the raw material. This is because the peel represent about 15% of the weight of the root, and its cyanogen content is usually 5 to 10 times greater than the root parenchyma²⁸. Peeling is **usually done by hand using a knife, a process that is slow and labour intensive, averaging about 25kg per hour.** The post-harvest Engineering unit of the International Institute for Tropical Agriculture (IITA) has developed a cassava peeling tool that is simple. Can be fabricate locally and gives minimum peeling losses.

In 1984, Product Development Agency (PRODA), a government research and development agency in Nigeria developed a prototype cassava peeling machine. One version was designed to run on an electrically driven motor. Another, on petroleum. This peeling machine had a capacity of 10,000 kg per hour.

The cassava peeler

Development of the Technology

Development of the cassava peeler was a government initiative. Informed by the development in the cassava value chain. The mechanized of grating now meant that the main labour constraint bottleneck had been transferred to three activities namely; harvesting peeling and toasting in the production of garri. Based on the

success of the grater, the government realized that mechanization of these activities would significantly lower the processing cost and raise cassava income to farmers and in turn drive the cost of cassava to consumers. It was also argued that the mechanization of any of the harvesting, peeling, and toasting operations would encourage further improved production and encourage farmers to expand the area under cassava cultivation.

Lessons Learned from the Failure of the Technology

This government-led intervention in cassava processing ignored development of partnership in technology development and deployment. Despite the technology aimed at addressing an urgent need within the cassava value chain in West African countries, one critical step in its development was missed, namely field testing and modification by value chain partners. This critical step should not have been skipped. The expectation that farmers and processors would adopt the mechanical peelers straight from the engineering laboratory was not realized. Adegboye, R. O. and J. A. Akinwumi. (1990), assert that "Even the earlier lesson that many entrepreneurs who bought the government graters either had the machines modified by local artisans or abandoned them was not taken into consideration. Shortcutting the intervention proved to be a constraint to the success of the cassava peeler.

The failure provides an important lesson for future introduction of technologies in commodity value chains in sub-Saharan Africa, that is, existence of an urgent constraint would succeed. A successful innovation should be aimed at redressing the constraints while fitting into the production circumstances of the actors. Towards this end, users' participation in testing and modification is important.

Opportunities for Redeeming the Technology

Cassava Processing centres are common in major cassava processing areas in West African countries. A processing centre is often a village square where village entrepreneurs provide farmers with customized cassava processing services using mechanized graters, mechanical presses and mechanized food crop mills. This arrangement enables farmers to have access to mechanical grating,

pressing and milling services in one convenient location without worrying about buying, operating or maintaining any mechanized equipment. It also provides small holders with access to labour-saving cassava processing equipment, which otherwise will be beyond reach.

A successful Technology in Banana Production in Kenya - Tissue - Culture

Description of the Technology

Banana tissue-culture entail rapid and sterile multiplication of banana plantlets by vitro propagation. It has long been common practice in other parts of the world, but until recently had not been commercially used in tropical Africa. The advantage of the technique is that large numbers of healthy banana plantlets can be produced in the laboratory in a comparatively short period of time. The technology reduces pests and disease problems for banana growers and offer an ideal opportunity to increase productivity. Since the plants mature early and uniformly, the technology is especially appealing to smallholders constrained by decline in farm sizes since they are able to harvest and sell fairly large quantities of bananas at one time.

Successful Oil Processing Technologies - KickStart's mafutamali (oil for wealth) program

Description of the Technology

KickStartmafutamali (meaning "oil wealth" in Kiswahili) is a manually operated oilseed process suited to small-scale sunflower cooking businesses in East Africa. It is designed based on an original "ram press" design by Carl Bielenberg, but has been modified to be more efficient, durable and profitable to use. Beside the press, mafutamali comes along with a Gravity Bucket Filter and a complete set of tooling for local mass production of both the press and filter. The press extracts oil from sunflower, sesame, and other oil seeds. The filter produces clear, cold-pressed, nutritious cooking oil ready for sale or consumption. The seedcake by-product is used as protein animal feed supplement. The KickStart Oilseed Press Business Package includes: a press, a bucket filter, a detailed manual, spare parts and a tool kit.

Development of the Technology

Economic liberalization in Kenya in the early 1990s featured termination of most public support for the agricultural sector. Control on price of the key

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commodities were lifted, as were those on sourcing of raw materials for local industry. This led to increase in prices of many commodities, including cooking oil. With funding from the Netherlands government and the British Department for International Development (DFID), KickStart, an international NGO, launched a cooking oil industry market research project. A major finding of the project was that the small-scale production and the sale of cooking oil could be profitable if the right technology were made available to local entrepreneurs. Based on these findings, KickStart trained local engineering firms to manufacture the new presses. A promotional campaign was launched to increase awareness and sales. Intervention included mobile truck demonstrations, radio and newspaper advertisements, exhibitions at trade-fairs, and broad-based media exposure.

A network of retailers for the new presses was established and linked to the manufacturers. The retailers sold the presses. In order to create a market for the oil press, KickStart also implemented projects that promoted increased production and sale of improved varieties of sunflower, sesame, oil-rape and safflower seeds.

Conclusion

For the above obstacles to be overcome thus the scientific and technological potential of African countries, it is necessary that African develop an understanding of scientific principles through the knowledge of physics, metallurgy, biology and chemistry. This is essential for establishing a strong scientific base which would encourage the asking of what-and how-questions and hence the use of empirical causation as opposed to agentive causation in explaining technological logical and natural processes. Although African cultures display the presences of indigenous technological capacities within them, those capacities could not be fully developed and expanded due to lack of understanding and application of scientific principles. To illustrate this point, Gyeke, (1997:35-36), cites a few case which include that of the Ghanaian motor mechanic and a woman food technologist.

The Ghanaian mechanic, who was working on the engine adjusting the contact breaker point in the car distributor, was found to be doing so using only his sense of sight and refusing to use technical aids such as the feeler gauge. His refusal to use technical aids was not peculiar to him but could also be found amongst other

mechanists is rooted in the broader societal culture. Such culturally entrenched attitude toward technical aids, he argues, not only deprives mechanists the benefit of achieving precision measurement for proper maintenance of the machines but also impedes opportunities of further growth and improvement of technology.

Similarly, the woman food technologist in Ghana was found to be practicing technology with some limited insight of scientific principles. The woman in question was processing "fantekenkey" which is described as a fermented cereal dumpling made from maize dough. While this woman displayed a high level of competency and knowledge in terms of handling the processing efficiently in terms of time and the material used to achieve desired outcomes, acknowledge clearly rooted in basic and applied scientific principles; she however could not articulate or explain those principles.

This and what seems to be the thinking amongst African technology practitioners that the what-and-how-questions do not matter in the application and practice of technology, whereby technology is meant to only resolve practical problems of survival, necessitate an urgent need for change in such attitude towards knowledge. Such a change in attitude will would make the possessed knowledge of technology exoteric and accessible to the public for scrutiny, thus releasing knowledge from mysticism or spirituality. The significance of such scrutiny lies in the fact that it could result in the existing knowledge being rejected, or amended or confirmed.

The new intellectual attitude, together with the understanding of scientific principles and the scientific principles and the resultant strong scientific base, is essential if the African countries are to fully exploit and adapt transferred technologies from the developed world to their own local conditions and to meet their needs. Hence, Gyeke, (1997:41) argues that, "this would enhance the appropriation of technology characterized by "the active, adroit, and purposeful initiative and participation of the recipients in the pursuit and acquisition of a technology of foreign production. This would, in this view, not only prevent Africans from becoming permanently dependent on technology transfer is guided by local principles and needs. Hi argument is based on the acknowledgement and recognition that technology is developed within specific cultural framework to

meet certain needs. Hence, Gyeke, (1997: 8 - 42), opine that "as a cultural product, technology transfer constitutes cultural borrowing, and therefore requires an active and adroit approach by the recipient in order to avoid a negative impact on local value and ways of life and ensure maximum benefit from it.

Thus, although there should be separation of cultural value and religious beliefs from scientific, technological world; both can still co-exist to ensure that technology is socio-economically beneficial while not undermining highly regarded cultural values. Hence, Senghor, 1963, quoted in English and Kalumba, (1996:50), "We could assimilate mathematics or the French language, but we could never strip off our black skins nor root out our black soul". So, we should endeavour to enhance African value system in relation to the contemporary technological development in order to build a better African society.

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