

IMPACTS OF TRADITION ON SCIENCE DEVELOPMENT IN NIGERIA

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Abstract

Tradition has become the basis of knowledge to every group of mankind throughout the world, as every community existence depends on their traditional values. In view of this, scientific development, which is also an attribute of knowledge, could not be totally divorced from these human traditions, which had either, enhance socio-economic and scientific development or inhibits the interaction of traditional values to scientific development. This study highlights the conceptual framework of tradition with regards to National Science Policy and their effect on scientific development in Africa, especially Nigeria. It also highlights the influence of traditional values such as hierarchy, egalitarianism and fatalism on science development. Each was categorized into problematic status each had on science development. In conclusion, suggestions were made as to link exploits of tradition on science development with a view of increasing scientific knowledge.

Keywords: Tradition, Science, Scientific Development, Community

INTRODUCTION

WHAT IS SCIENCE?

Science has been defined as the art of generating, adapting, transmitting and using of verifiable knowledge for socio-economic growth of any nation, Mabawonku (2002), Goldsmith, (1986), stated that science is general is a social phenomenon linked organically with all other forms of human endeavour in order to make science a source of comfort, security of life and other good things provided by modern technology. In view of this, it has been noted that technology and scientific positivism constitute the dominant ideology of Western civilization today. Technology like science has indeed become the metaphysics of our age, a totalistic form of secular religion ultimately incompatible with the existence of rival, non technological assumptions, beliefs or thought systems, which had automatically enhance the economics of these Western countries through the accumulation of physical capital and human skill based on their foundation of information (science learning, and adaptations, in linear agreement with this, Oyelaran, (1996), assumes and said that through doing fundamental science, discoveries were made, which led to experimental findings, when applied, it yields inventions, when developed, it leads to innovation which indirectly induces commercial introduction of process and products; “from which entrepreneurial acts lead to imitation and diffusion equating to the global gap of well-being” with an imbalance of science and technological development globally. In his words, it has helped to demonstrate to the world that having the capacity to understand and use science is economically, socially and culturally profitable, since the spread of scientific culture of scientific ways of thinking out of knowledge is tied to the fate of humanity. [13] [7] [16]

Consequently, the linkage of science development to scientific culture for global citizenship cannot be divorced from the concept of traditional culture as stated by Bello (1991), that culture which is synonymous to tradition is the sum total of man’s (mental and manual) creative abilities which is expressed in his capability to subject and transform his natural environment as well as organize his social existence through a set or series of institutions, regulations and values. Invariably this suggest that every institution, nation, settlement or any humanly existing environment do have their norms, regulations and values which help to control socio-economical changes as well as creativity and freedom among different ethnic group despite their divergent patterns of belief, behavioural patterns, innovative skills and scientific development. Science is expected to be incorporated in policies for economic development with focus on social and traditional factors that can enhance the process of scientific knowledge generation imitation, diffusion and utilization, especially in a third world country like Nigeria. The aim of this paper is to provide a conceptual framework for understanding the inter-relationship between tradition and science development in a third world country (Nigeria) by evaluating policies on science development. [4]

CONCEPT OF TRADITION

Tradition is usually seen as an element of meaning, studying social practices regarded as traditional in terms of Values, Culture and History. The conceptualization of tradition had not be easily achieved, because scholars are yet to situate its use in particular historically specific discourses in terms of knowledge and application to developing countries developmental planning. According to Tylor, (1871) as seen in Encarta,(2000), culture was defined as that complex whole which includes knowledge, beliefs, arts, morals, law, customs and any other capabilities and habits acquired by man as a member of a society. According to the contemporary Webster Dictionary, tradition is regarded as the passing down of opinions, beliefs practices and customs from the past to the present especially by word of mouth or practice. [19]

In line with these definitions of culture and tradition, it could be borne that there are inter-relationships in their attributes hence helping to give a conceptualization that tradition is a social process encompassing a way of life as conceptualize by Alexander and Kumaran (1992 p.12). Moreover, in challenging the traditional concepts of liberty as offered by the Russian revolution of 1917, Otto, (Encarta 2003), stated, that all previous codes of liberty were ideologies of the ruling classes or of classes aspiring to power and did not benefit the vast majority of the population. He also noted that traditional religions concept is experienced as something fearful and alienating as well as something comforting with which one feels a certain communion or continuity in terms of doctrine and morality as seen in the supernatural affiliation of Africans to their goods and beliefs. [2]

Thus, it could be ascertained that traditional system in any community, states or nation is predicted by it's survival, domination and control in terms of their cultural attitudes, ethics, knowledge, practices, values, beliefs and regulations or rules. In Africa, Children and Youths are basically trained up in a traditional way. According to Fafunwa 1974, he regarded this as been multilateral with an end objective of producing an individual who is honest, respectable, skilled, co-operative and do conform to the social order of the day. He went further to state seven educational objectives of traditional Education in Nigeria, a country characterized with multicultural ethnics groups and society having diverse social, economic and geographical imperatives, these objectives include:

- A To develop the child's latent physical skills.
- A To develop character.
- A To inculcate respect for elders and those in position of authority.
- A To develop intellectual skills.
- A To acquire specific vocational training and to develop a healthy attitude towards honest labour.
- A To develop a sense of belonging and to participate actively in family and community affairs.
- A To understand, appreciate and promote the cultural heritage of the community at large. [5]

In view of these, it could be summed that the traditional system is determined by a kind of cultural purpose in terms of beliefs and worldviews in understanding the disparity between different modes of organizing social life Wildavsky (1994). [20]

This concept of traditional view had been a tool of indices in socio-economic development and science development of every nation including Nigeria as a third world country and other well scientifically advanced countries of the world like Japan, Europe and America.

SCIENCE DEVELOPMENT AND POLICY FRAMEWORK IN NIGERIA

Science development is synonymous to economic growth which involves physical infrastructure; roads, factories, telephone networks etc. it also include expansion of the labour force and increase of its education and training (World Bank, (1999). Thus, in the new globalization of economy, increasing knowledge and skill enhancement of the labour force is one of the prerequisite to better economic performance, meaning that the labour force should learn the process of creating knowledge which is the hallmark of science culture. [21]

According to Goldsmith (1986), the public understanding of science is very crucial for long term scientific development which could be enhanced through public forms of education, research and science development policies. Igbeka, (1998) stated that, Nigeria, like many other countries had adopted a single policy framework designed to address the following four principles:

- TM Co-ordination and selection of science and technological objectives consistent with national development and strategies.
- TM Setting of the required norms, which govern the ways and means in which science and technology are to be developed, transferred and applied.

- TM To harness the required resources and provide the basis for the organization and development of scientific and technological resources to achieve the selected objectives and
- TM Setting up the structure for continuous monitoring and evaluation of the results and implementations of the policy in the overall national development. [7] [10]

There was no coordinated science and technology development programme in the country during the colonial era except for regional development. Thus, the concept of tradition adopted by each region in terms of hierarchy, fatalists, individualistic and egalitarian aided the level of scientific and economic development, which had made the Western region of Nigeria to be at the lead in all forms of science and economic development.

Between 1963 and 1965, the United Nations Educational and Scientific Organization (UNESCO) organize a series of conferences to emphasis the need for developing countries to set up science policy-making bodies in order to maximize efforts in the application of science and technology for national development. This prompted the Nigerian government to setup in 1966 the Nigerian Council for Scientific and Industrial Research. This body was an advisory body without power to actualize their plans and goals (Awe, 1982). Between 1966 and the present, there has been eight changes in the institutional arrangements for policy formulation and management (Igbeka, 1998). [3] [10]

In 1986, the Federal Ministry of Science and Technology, for the first time published the *National Policy on Science and Technology* for the country. The stated objective of the policy document was to:

- Increase public awareness in science and technology and their vital role in national development and well-being;
- Directing science and technology efforts along identified national goals,
- Promoting the translation of science and technology results into actual goods and services,
- Creating, increasing and maintaining and endogenous science and technology base through research and development;
- Motivating creative output in science and technology,
- Increasing and strengthening theoretical and practical scientific base in the society; and increasing and strengthening the technological base of the nation.

To ensure effective implementation of the policy initiatives, the Federal Government in 1988 published the *Action plan for the Implementation of the National Science and Technology Policy*.

Following a critical review of the science and technology sector in the country by Prof. G. O. Ezekwe who was the Minister of the Federal Ministry of Science and Technology in 1990, the Federal Government in July 1992 set up the National Agency for Science and Engineering Infrastructure (NASENI). For instance the National Policy on Science and Technology stipulates that the Federal Government will fund science and technology development programmes up to a level of 5% of its annual budget, whereas, allocation to science and technology did not exceed 0.2% from the time the policy was launched up to 1990. Also, the National Science and Technology fund, which was to be an extra budgetary fund, was supposed to have 1% of annual GDP accrued to it. The funds for implementing the science and Engineering Infrastructure Development Complexes, which replaced the National Science and Technology Funds Act, are to be generated from:

- TM 1% of federation account in the first instance, to be increased to 3% by the year 2000,
- TM 0.25% on turn over of commercial companies and firms with turnover of 4 million Naira and above pr annum,
- TM Contributions from the organized private sector,
- TM Foreign aids and assistance from bilateral agencies, and
- TM Fees charged for services rendered by the Agency.

According to Igbeka 1998 and that, apart from inadequate funding due to lack of commitment by the Federal Government, the other specific problems encountered and militating against effective implementation of the policies are identified as:

- A Institutional instability,
- A Lack of adequate facilities for the creation of necessary science and engineering infrastructure;
- A Weak link between research and development, and
- A The national reward system, which is based on certificate and experience rather than creativity and productivity. [10]

It will also be recalled that the 2004 National Policy on Science and Technology gave visibility to the teaching of science in Nigerian schools, which formally prescribes a ratio of 60:40 in favour of science based disciplines for enrolment in institutions of higher learning. Likewise, the National economic empowerment and development strategy also encourages the schools system to focus more on science and matters relating to technical and vocational education.

Presently, as can be seen in tables 1, 2 and 3 the enrollment for science related disciplines in Nigerian Federal Universities for year 2004 had risen to 55%, State Universities to 37.3% and Private Universities to 36.7% as against their arts based discipline (NUC, 2004 as cited by Punch newspaper, 2006). In all, there was an overall national ratio of science arts enrolment, which stood at 49:51, though this appears encouraging, Nigeria is still regarded as one of the most scientifically backward countries in the world. According to the Africa 2004 and 2005 World Science reports, most of the countries in Africa represent perhaps the most scientifically backward countries in the world in terms of basic input and output (Punch 2004 p 54).

Table 1 Science-Base And Arts-Based Ratios In Nigeria Universities

FEDERAL UNIVERSITIES		Student enrolment			
		Science-based		Arts-based	
S/N		No.	%	No.	%
1	University of Ibadan	9700	51.2	9257	48.8
2	University of Lagos	12419	45.1	15113	54.9
3	University of Nigeria, Nsukka	15693	56.3	12174	43.7
4	Ahmadu Bello University, Zaira	11359	37.1	19293	62.9
5	Obafemi Awolowo University, Ile Ife	13445	50.9	12990	49.1
6	University of Benin	17011	61.7	10566	38.3
7	University of Jos	7828	49.1	8118	50.9
8	University of Calabar	8273	41	11920	59
9	Bayero University, Kano	14063	47.1	15762	52.9
10	University of Maiduguri	9120	36.6	15805	63.4
11	Usmanu Danfodiyo University, Sokoto	7286	52.3	6632	47.7
12	University of Ilorin	9148	48.7	9638	51.3
13	University of Port-Harcourt	7039	43	9518	57
14	University of Uyo	8753	53.5	7616	46.5
15	Nnamdi Azikiwe University, Awka	12259	50.0	12247	50.0
16	University of Abuja	1660	15.4	9127	84.6
17	University of Agriculture, Abeokuta	5792	100	0	0
18	University of Agriculture, Makurdi	3377	100	0	0
19	Michael Opara University of Agric., Umudike	1550	95.8	68	4.2
20	Federal University of Technology, Owerri	22725	89.4	2703	10.6
21	Federal University of Technology, Akure	8028	100	0	0
22	Abubakar Tafawa Balewa Universi, Bauchi	7097	88	964	12
23	Federal University of Technology, Mina	15228	100	0	0
24	Federal University of Technology, Yola	8042	72.2	3094	27.8
25	Nigerian Defence Academy, Kaduna	497	51	478	49
26	National Open University	1876	29	4591	71

Table 2 Science-Base And Arts-Based Ratios In Nigeria State Universities

STATE UNIVERSITIES		Student enrolment			
		Science-based		Arts-based	
		No.	%	No.	%
1	River State University of Science and Tech.	11001	53.2	9694	46.8
2	University of Ado-Ekiti	2811	25.1	8366	74.9
3	Olabisi Onabanjo University, Ago Iwoye	21317	35.3	22597	64.7
4	Ladoke Akintola Univ. of Tech., Ogbomosho	5539	93	436	7
5	Adekunle Ajasin University, Akungba	1868	25.0	5618	75.0
6	Benue State University, Makurdi	1411	11.9	10472	88.1
7	Delta State University, Abraka	9847	30.3	22628	69.7
8	Kano Univ. of Technology, Wudil	1103	100.0	0	0.0
9	Nasarawa State University, Keffi	703	13.2	4116	86.8
10	Kogi State University, Anyigba	4229	46.6	4844	53.4
11	Lagos State University, Ojo	5420	35.8	9732	64.2
12	Abia State University, Uturu	7574	45.0	9246	55.0
13	Ebony State University, Abakaliki	6095	29.9	14297	70.1
14	Niger Delta University	2335	33.0	4753	67.0
15	Adamawa State University, Mubi	942	66.2	482	33.8
16	Anambra State Univ. of Science & Tech.Uli	3461	50.6	3378	49.0
17	Cross River State University of Sc. & Tech	1654	57.0	1248	43.0
TOTAL (State Universities)		78310	37.3	131898	62.7

Table 3: Science-Base and art Based Ratios in Nigeria Private Universities

PRIVATE UNIVERSITIES		Student enrolment			
		Science-based		Arts-based	
		No.	%	No.	%
S/N					
1	Igbinedion University, Okada	1249	41.6	1755	58.4
2	Madonna University, Okija	2537	47.0	2956	53.0
3	Babcock University, Ilisan Remo	1238	36.8	2125	63.2
4	Pan African University, Lagos	0	0	94	100.0
5	Benson Idahosa University, Benin	595	19.6	2427	80.4
6	Covenant University, Ota	1612	37.3	2705	62.7
7	Bowen University, Iwo	806	29.9	1891	70.1
TOTAL (Private Universities)		8037	36.7	13852	63.3
Source: NUC Memo (Punch, 2006)					

TRADITIONAL INPUTS AND SCIENCE DEVELOPMENT

Emanating from this conceptual framework of tradition, knowledge could be advocated or inferred between tradition and its impact on science development in an Africa context. Many definitions had been given to the word science, according to Keith Ward (2000), science was defined as a experimental investigation into a physical phenomenon, where precise observation can be made and measurement taken, where experiments are repeatable and publicly testable and where hypothesis need to be constantly tested and reassessed. [11]

Scientific revolution has been claiming that, tradition believe in the past while science represent the present and future, in that science is concerned with measurable of physical and repeatable experiments unlike tradition which is concerned with the spiritual, immeasurable and the ungenerous of individual in terms of understanding, responding empathizing and cooperating.

This definition implies that science is empirically verifiable, however an ingredient of traditional progression, and it could have influence on the abilities and knowledge of humans in terms of their moral, cognitive, evaluative, productivity, professional skills and forms of communication in their world outlooks, (Mabawonku 2003). This definition also suggests that science is a form of knowledge, which has to do with modernity.[14]

In view of these, Alexander and Kumaran, (1992 p 13) had classified cognitive ideas into scientific and philosophical knowledge while evaluative idea had been classified into ideological and religious knowledge inter-relation to their empirical verifiability. Cognitive ideas involve intellectual and tough mental processes, which are often limited in usage to a selected group of people within the society while evaluative ideas, are publicly generated and readily available for every member of the society.[2]

In order to use these categories of knowledge to discuss the impact of tradition on science development, we adopt the categorization of traditional beliefs put forward by Wildavsky (1994). These include fatalists, hierarchies, egalitarians and individuals. Thus, we shall be viewing the three major ethnic groups in Nigeria in respect to the impact of these traditional beliefs on each regional scientific development. Presently, under the democratic dispensation the country had been divided into six geopolitical zone borne out of the formerly existing regions, these include north central, north west, north east, south west, south east, south. [20]

The fatalists have a general belief that nature is capricious and that since physical nature operates at random and human nature is unpredictable hence, people cannot change the way events will happen and that bad events cannot be avoided. The purposes of their existence are dependable on individualistic survival and have a socio-political attribute that requires the more manipulative cultural categories such as hierarchist or individualist to achieve anything. Wildavsky observed further that fatalists' knowledge system is religious because it is not empirically verifiable. The effect of this fatalists on science development was realized by the Muslim intellectuals especially those from the North / some Western parts of Nigeria when they discovered that the western type of Education embraced by others allowed for industrialization, scientific and technological advances as well as allowing them full participation in the administration of government. This brought about a twist in their educational system, which had been purely traditional to include a Western line of education to allow for a steady scientific development, Fafunwa (1974). This fatalist belief had affected scientific initiative and investment and largely contributed to African's poor scientific growth. [5]

On the part of the hierarchists, they hold the view that nature is robust and that appropriate resource conservation and development strategies can be developed. They are also of the viewpoint that the use of resources should be regulated and that responsibilities should be distributed among groups of people. According to Wildavsky, (1994); there are two forms of hierarchist namely: inclusive and exclusive, the earlier is more hospitable to competition and accommodate fairly diverse groups requiring innovative ideas or the scientific knowledge system to stay competitive. The exclusive, are very rigid and resistant to competition, suppressing the search for and use of scientific knowledge that may challenge their power and authority as it is been experienced in the Northern region of Nigeria, where traditionally every information, innovation and knowledge comes directly form the ruling class to the subjects. This group of hierarchies is more ideological in posture although forming strong social group ties, but constrained by social norms and exists to create and maintain differentials within the society. They are unable to manage their needs due to their structural basis of needs. They lack a rapid scientific growth due to their conservativeness and unyielding posture to modern technology. They see every scientific innovation as an intrusion to their traditional concept even to the detriment of the young ones medically. [20]

In the Eastern part of Nigeria, where ecologically and environmentally they had been at a disadvantage due to effect of civil war and exploration activities, have over the years develop an individualistic belief, wherefore, individuals have the ability to manage their lives and to provide innovative solutions to their problems as the environment permits. They see nature a vast, but not freely available, hence the need to manipulate nature for their use. Therefore, through ideological and empirically verifiable knowledge, they have continuously show diverse innovation in revealing the hidden aspects of nature. These groups of Nigerian form networks for filtering out the data and information they do not need and retain the ones they need. This individualistic belief shares same content of attributes with that of scientific knowledge system. In socio-political relations, they seem not to be constrained by social norms and do not form close ties with people, acting independently in respect of their needs and goals.

The last group of belief, Egalitarians, regards nature as been fragile and that resources are fixed with a mindset that all people are equally important and should have the same rights and opportunities in life although philosophical in knowledge, they form strong ties with members of their group and strongly oppose those outside their group, ever refusing to compromise with the under society. However, these four categories of knowledge are known and been noticed to have been overlapping with one another according to Mabawonku (2003). Egalitarians could not exist without the inequalities produced by individualist market and hierarchists opposition; hierarchists would lose their rationality without individualist, egalitarians, and fatalist disorders to overcome; individualists require a modicum of hierarchical order to stabilize property and exchange relationships and fatalists need the more manipulative culture to work around. In the word of Gottstein (1987) science development to greater or lesser extent, has developed in most cultures just as every culture has an indigenous religions knowledge system. [13] [8]

DISCUSSION AND CONCLUSION

A society is never separable from the individual of which is composed. The experience and behaviour of an individual are shaped from birth by pre-existing customs, which allows interrelationships between behaviour, pattern, ideas, concepts and attitudes. According to Vincent Lloyd (2000), tradition is defined as a trans historical evolving set of social practices, a feature missing from non-traditional accounts (including styles of reasoning and pattern of acting). In view of these features, indigenous education could still be found on the cultural landscape of many ethnic groups of Africa. [12]

Taiwo (1993), stated that these trans-historical tradition evolving in African societies had broken down in many African nations including Nigeria as a result of colonization, intrusion of foreign economic and technological policy. African societies had shown a scientific basis revealing in the context of transition to orderly having been described by Fasunwon and Mabawonku (2001) as having some elements of the scientific and technological knowledge system because they have a recognizable, sophisticated system of generating, distributing and utilizing knowledge and information. [18] [6]

In African societies, there had not been a free flow of knowledge and information as seen in scientifically developed nations, which had been largely due to the effects of our traditional attitudes involving the mixture of exclusive hierarchical and individualistic attitudes. In many African countries the exclusive hierarchists group are more prevalent especially in Nigeria as rightly observed by Olasehinde (1994) that the average Nigerian rarely attempts to question realities. What is traditional must be traditional and religiously adhered. To doubt or attempt to radically modify tradition is in many cases almost sacrilegious such an unquestioning acceptance of the status quo permeates several facets of the society and is especially evident in the cultural attitude towards beliefs, ceremonies and customs. Moreover, he expressed that Nigeria is a society where magic and superstitions inform people's thought processes. For example, natural phenomena such as lightning, earth tremors and floods are often associated with some gods clamoring for appeasement. Mistakes and accidents or misfortune are always associated with evil forces or taboo. [15]

Another traditional attitude / attribute hindering science development is that of the fatalists who had a belief that events could not be changed hence desire not to bear risk or ready to view things from a critical point of scientific knowledge. They found it difficult to admit their inadequacies in order to subject such to a scientific innovation and findings.

In the year 2005, when the government of Nigeria embarked on a campaign against the spread of polio by giving every child a polio vaccine, the conservative northern region bluntly refused and prevented their populace from accepting the vaccine due to their fatalists and hierarchical nature of life. They gave an excuse that it was a way through which the government in collaboration with the Western countries are trying to infect their children with an incurable disease. These traditional attitudes of the fatalists and hierarchy have become inimical to scientific growth and development in Nigeria. Presently only a small percentage of Northern region schools, parastatals and other government functionaries are computer compliance. Africans in general due to their inability to incorporate or compromise their traditional belief with modern scientific technology, unlike Asian countries like china, Japan and Koreans who had used their traditional concepts as advantages to undergo rapid scientific growth, had made the continent to be fifty or more years behind modernity.

Presently, the world economy and scientific development is becoming globalised, hence the need for the blending of tradition with knowledge, creativity, flexibility and motivation to enhance scientific development. Thus in the African context, it is expected that there must be an avenue to interact, exchange ideas, knowledge, values, beliefs, cultural identities with other well developed nations in order to learn how to incorporate our traditional thoughts into a scientific evolution. Since globalization tends to force the whole world into a global village, there is a need for Nigeria as an African nation to increase her potentials of knowledge generation and information flow irrespective of the traditional input.

The development of science in third World Countries had been attributed to lack of natural development planning due to traditional impediments, Abdul Salam (1987), stated that, is seen as a threat to the hierarchical structure of many African nations, since it is a means of gaining and ascertaining status and power therefore, any scientific introduction, or innovation is usually stamped upon. [1]

Another bane of scientific progression in Nigeria (Africa) had been majorly due to instability in leadership, developmental policy and corruption, in fact Nigeria has been ranked the second most corrupt Country in the World, inconsistency had also affected the educational policy of Nigeria, which within the past twenty years had experienced three different policies in her educational system.

Moreover, improper implementation of National development plan especially in the area of science had caused a major setback to science culture in African countries. This is largely caused by the socio-cultural attitudes of African leaders who are either fatalists or exclusive hierarchists. Therefore, there is a need to promote individualism approach and inclusive hierarchy in order to promote scientific culture and interaction in the continent. Science is a source of information and information is a means of existence when a country does not have the facilities to promote the flow of information, it definitely remains a backward and deprived nation. It is through scientific development that country information flow and country's gross domestic production can increase as it had happened in the case of Japan right from 1868 when the Emperor of Japan stated that "knowledge will be sought and acquired from any source with all means at our disposal for greatness to be achieved".

Conclusively, African nations including Nigeria which is made up to diverse culture should not be too possessive with their traditional beliefs which had not worked in harmony with the new trend of science development in the world over, rather each third world nation should design a well structured developmental plan (science inclusive) to allow for inter-relationship and knowledge interaction between traditional ways and modern ways in creativity, productivity, skill development, Biotechnology, genetic engineering and human genome research in order to promote scientific publication and technological innovations.

There should also be a strategic plan of bridging the missing links between enrolment for science based disciplines and service delivery in our institutions by embarking on a public enlightenment programme in order for our core hierarchicist, fatalists of religion based knowledge traditions to be move open to modern scientific innovations and development. Therefore, more cognitive and empirical studies are needed to complement whatever is on ground in order to foster a dynamic relationship and interaction between traditions and scientific development in Nigeria, and African as a whole.

REFERENCES

- [1] Abdul Salam (1987) "Science transfer for development and global problems of science and technology" in a man of science pages 38 – 50.
- [2] Alexander, K. C. and K. P Kumaran (1992), *Culture and Development: Cultural Patterns in Areas of uneven Development* (Sage Publications, New Delhi)
- [3] Awe, O. (1982). Science, Technology and Nigerian Development, University Lecture on behalf of Faculty of Science, University of Ibadan, June 1982.
- [4] Bello, S. (1991), "The new national cultural policy of Nigeria: towards cultivating a culture of development", in S. Bello and Y. Nasidi (editors), *Culture, Economy and National Development* Proceedings of the national seminar Evens of NAFEST, 1989.
- [5] Fafunwa, A. B. (1974), *History of Education in Nigeria* (NPS Education Publishers Limited, Ibadan) pages 4 – 10.
- [6] Fasunwon O. O. and Mabawonku, A. O. (2001) Cultural challenges to the development of science and technology in Africa
- [7] Goldsmith, M. (1986), "The proper public for science", *Physics and Development*, 7, International Centre for Theoretical Physics, Trieste, Italy, Page 87.
- [8] Gohstein, K. (1987) "Cultural identity and scientific technological development: questions, theses, antitheses" *Physics and development*, 9, International centre for theoretical physics Trieste, Italy,
- [9] Horton, R. (1967), "African traditional thought and western science", *Africa*, XXXVII (1 and 2), January and April, pages 155 – 165.
- [10] Igbeka, J. C. (1998), "Technology and industrial policies as they affect the agricultural machinery manufacturing industry in Nigeria", Research Report number three (3), Development Policy Center, Ibadan, page 88.
- [11] Keith Ward, (1969). "Science and Religion in modern world", in Encarta Encyclopedia deluxe 2003.
- [12] Llyod, V. (2000) Thinking the present, Conference panel, the politics of tradition, in Encarta,2003.
- [13] Mabawonku, A. O. (2002), "An evaluation of community knowledge and information resources: a case study of Eruwa town in southwestern Nigeria", Research Report submitted to Robert S. M. C. Namara Fellowship Programme, World Bank Institute, Washington D. C.
- [14] Mabawonku, A. O. (2003) "Cultural framework for the development of science and technology in Africa" in *Science and Public Policy* 30 (2) pages 119 – 124.
- [15] Olasehinde, O. (1994), "The scientific woman in a non-scientific society: problems and prospects", in S. Y. Erinsho (editor) *Perspectives and Women in Science and Technology in Nigeria* (Sam Bookman Educational and Communication Services, Ibadan) pages 15 – 28.
- [16] Oyelaran O.B. (1996), " Issues in technology and Nigeria's industrialization", *Technology Research Policy Brief*, 1 (1), Africa Technology Policy Studies Network, Ibadan, page 24.
- [17] Punch Newspaper (2006) Arts and Science enrolment ratio in Nigerian Universities pages 54 – 55.
- [18] Taiwo, O. (1993), "Colonialism and its aftermath: the crisis of knowledge production", *Callaloo*, 16(3), pages 891 – 908.
- [19] Tylor, E. B. (1871). "Primitive culture" in Encarta Encyclopedia, deluxe, 2003
- [20] Wildavsky, A. (1994), "How cultural theory can contribute to understanding and promoting democracy, science, and development", in Ismail Serageldin and June Taboroff (editors), *Culture and Development in Africa*, Proceedings of an international conference held at The World Bank, Washington D. C., Environmentally Sustainable Development Proceedings series no1.
- [21] World Bank (1999b), "Nigeria: consultation with the poor", prepared for the Global Synthesis Workshop. 22nd – 23rd September, Poverty Group, PREM, World Bank.