Language and the Accessibility of Open Access Knowledge for Africa’s Development and Emergence Agenda

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Abstract

While progress in open access of scholarship and knowledge is thriving at the global level, there is little progress in the appropriation of open access knowledge resulting from such scholarship by the majority of Africans in the process of national development. This paper demonstrates that that language is a major contributory factor to this sorry state of affairs. More specifically, ‘open access knowledge’ is open, available but not accessible to the majority of Africans in need of this knowledge for personal emancipation from the strictures of poverty and want and for effective and substantial contribution to the national development agenda that envisions emergence in the forthcoming decades. Open access knowledge is available but not accessible because it is hoarded in a global language of wider communication that is nevertheless an exoglossic or foreign official language (English, French or Portuguese), mastered at a functionally significant level by only 10 to 40% of the population of African nations. This ipso facto exclude access of such knowledge to the majority 60 to 90% who function uniquely or essentially in African languages.

Consequently, with respect to the strategic development plans for the emergence of African nations in the present ‘age of knowledge economy’, the appropriation of knowledge in general and open access knowledge in particular, stands in need of an African praxis that will enhance and maximize access to knowledge by the majority of the population. We present such praxis in terms of a model of language planning that envisions the judicious use of official languages in partnership with African languages in the four paradigm activities of the knowledge economy: Knowledge Production, Knowledge Dissemination, Knowledge Appropriation and Knowledge Management. Thus, a planned system of linguistic partnership such as (inter alia) the tier stratification model of language planning (Chumbow 2009,2012), ensures that knowledge produced locally and by the global community is ultimately available in both official and local languages of the nation and will ipso facto lead to the democratization of access to knowledge (and access to open access knowledge in particular). This is expected to contribute significantly to the positive execution of the development agenda of African nations in terms of the ideals of participative communication for participative development.

1.0 INTRODUCTION

Since the advent of political independence for most African nations in the 60s, development has been a much desired yet illusive ideal. Most countries have struggled for decades with five or seven-year national development plans using for implementation strategies external economic formulae like Structural Adjustment program, Poverty Reduction Program, NEPAD Agenda etc. All of these economic development postulates and prescriptions were presumed and assumed to possess the potency of propelling African nations up the ladder of development. However, despite dedicated efforts, in the long run, some countries instead found themselves below the first rungs of the ladder of development as ‘Heavily Indebted Poor countries. They had to work hard, through a process of economic monitoring, mentoring and strictures to get back to the starting point of the race for economic development by way of the benevolence of debt cancellation. Nevertheless, the efforts of some have been rewarded to the extent that recently the political discourse of governments’ aspirations includes becoming emergent nations in the near future. Indeed, most countries of Africa have an emergence agenda that putatively should propel them to emergence and economic development in a near future target date.
What is development? What is emergence? To what extent can African nations achieve these glorious development targets? What are the specificities of access to knowledge in Africa? How is language related to development and access to knowledge and the knowledge economy industry of the 21st Century? What African praxis is necessary to maximize the democratization of access to knowledge and ensure the appropriation of development-relevant knowledge in the enterprise of national development and economic emergence? What development paradigm would be appropriate for African nations that seek to emerge in the era of knowledge economy? These are the issues addressed in this paper.

1.1 Definition of the National Development Ideal

The importance of national development is evidenced by the existence of national strategic development plans in every nation. Yet there is no universally accepted definition for development. We defined national development in Chumbow 1990 as “the nation’s human resources acting on its natural resources to produce goods (tangible and intangible) in order to improve the welfare and social well-being of citizens of the entire nation in terms of indicators of development predicated on minimum standards of living which include (among others) a reasonable standard of good health, housing facilities, food security, life expectancy (reduction of infant mortality, and improvement of maternal and reproductive health), education, literacy, employment, etc.” We will return to the issue of the ideal development paradigm for Africa given its specificities with the current Knowledge Economy and knowledge society changes, suffice it to summarize development in the words of Francis Kimeng as follows:

 Development involves a process of dynamic change, betterment, improvements in the economic, social, cultural, political, spiritual and psychological aspects of life of a given community or society (Kimeng, 2012)

1.2 Access to Knowledge and Open Access knowledge

The ultimate issue under discussion here is access to knowledge, especially with the advent of open access knowledge and its potential for development. This requires some discussion from the outset. Given the crucial relevance of knowledge to development (as will become obvious below), the issue of access to available knowledge becomes crucial.

While knowledge has been the object of hoarding in view of its economic value for decades, the advent and militancy of the Open Access Movement is changing the picture. Gone are the days when Russia and China perfected the machinery and tools of industrial espionage to empower themselves with knowledge produced in the West. Recall the epic spying battles between the Russian KGB and American CIA, dramatized in such Hollywood classics and best sellers as ‘James Bond 007’. The fall of the iron curtain and the disintegration of the Union of Soviet Socialist Republic (USSR) led by Russia, signaled the end of the ‘cold war’ that was characterized by the ‘equilibrium of fear’ in that the world owed some semblance of peace only to the mutual fear between the two ‘knowledge’ super powers: USA, champion of capitalism and neo-liberalism, and USSR, champion of communism. Indeed, the specter of a third world war in the aftermath of the bipolarization of the world as allies of the two giants was ever present until the end of the cold war diffused the tension. It is gratifying that the initiating champions of the open access knowledge movement come from the former USSR. Indeed, the movement is known to have been initiated officially by a public statement relating
to open access to research literature issued by “The Budapest Open Access Initiative (BOAI)” in February 2002. The statement reads:

There are many degrees and kinds of wider and easier access to this literature. By ‘open access’ to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited (BOAI 2002).

In fourteen years since the Open Access statement, there is now a worldwide “open access” movement that is ideologically apparently more potent and more popular than the capitalism-communism divide of yester-years. It is significant that it is not only very popular in Europe but also in the United States of America where many organizations are championing the cause of open access knowledge, including interalia the Coalition of Open Access Policy Institutions (COAPI), an Association of University institutions of the USA and Canada.

While the initial definition of Open access has been broaden and in some cases with minor constraints, the key concern remains that online research outputs should be free of all restrictions on access (e.g., access tolls) and free of many restrictions on use (e.g. certain copyright and license restrictions).

A consensus definition of open access, in light of recent developments, might be that Open Access articles are published under the “Creative Common Attribution Licence” which permits any use, distribution and reproduction in any medium provided the original author(s) and the source are credited.

According to the Wikipedia Encyclopedia 2016,

‘One of the great beneficiaries of open access may be users in developing countries, where currently some universities find it difficult to pay for subscriptions required to access the most recent journals... The OA movement is motivated by the problems of social inequality caused by restricting access to academic research, which favor large and wealthy institutions with the financial means to purchase access to many journals, as well as the economic challenges and perceived unsustainability of academic publishing. (Wikipedia curated out in February 2016)’

Indeed, it is our considered position that Africa is among the potential beneficiaries of the open access movement as long as there is a policy of ensuring that open access knowledge is really accessible to the majority of African populations that need this knowledge for their personal empowerment to become knowledgeable and effective participants as agents of change in the socio-economic-political transformations envisaged by the national development agenda. This is currently not the case, as open access knowledge is not widely accessible on the continent. To remedy this situation a diagnosis of related problems is indispensable.

**2.0 KNOWLEDGE AND KNOWLEDGE ECONOMY**

In this section, the relation between knowledge and development is examined and the role of language in the building of knowledge industries which are crucially relevant to a knowledge economy, the bedrock of development, is discussed in some detail.
2.1 Knowledge Economy

The present century, is known as the age of knowledge economy.

Knowledge economy refers to an economy focused on knowledge production, knowledge management, and knowledge dissemination. The key element in knowledge economy is that it is a structure of production and consumption that is based on understanding creativity and innovation and using them to drive change. This underscores the role of intellectual capital in knowledge economy in that the focus in the present age of Knowledge economy is individuals’ capacity to use their knowledge power and intellectual ability to think-out, adapt, create and innovate to develop solutions to identified problems of society and mankind. The result is new knowledge and products of the intellect that lead to social and economic change and transformations that impact the quality of life of mankind. Rapid changes in industrialization driven by change in Information and Communication Technology characterize the age of knowledge economy which is also known as the age of information and Communication technology.

Knowledge economy is therefore an economy that is informed, powered and empowered by knowledge created, generated, produced by way of innovation and change and made available and accessible or disseminated using relevant language (or information and communication technology) to improve the welfare of humanity.

The Wikipedia encyclopaedia defines knowledge economy as ‘the use of knowledge (savoir, savoir faire and savoir etre) to generate tangible and intangible values’ (curled in March 2016)

As observed in Chumbow 2011a, in the present age of globalisation, the world economy is driven by knowledge, knowledge in all its forms (scientific, technological, cultural, etc.). That is why it is said that the world is ruled by a knowledge economy. "...this means that, all things being equal, countries that aggregate more productive and innovative knowledge will be socially and economically more developed than those that aggregate less of such knowledge. Thus, the United States of America, Germany, France, Britain, China and South Africa, (among others), are knowledge economies and therefore more developed than others like Cameroon, Nigeria, Senegal, etc. The aphorism: ‘Knowledge is power’ (Sir Francis Bacon, 1597)) derives its veracity and popularity from the power of knowledge economies. All relevant development parameters considered, it is clear that the wide gap between the North and the South is essentially a knowledge economy gap" (Chumbow 2011a)

The race for the illusive ideal of ‘development’ by African nations and countries of the South is, indeed, an effort to find a space in the enterprise of knowledge economy and emergence is merely the desire to be defined in relation to standards and levels of socio-economic achievements attained or established by the nations of the North in the enterprise of knowledge economy.

The much sought-after ideal of emergence that is conceptualized as the goal and finality of strategic development plans by African countries such as Nigeria’s vision 2020 or Cameroon’s Horizon 2035 etc. (or by whatever names they have been called) under the dictates of the World bank and IMF, simply refers to economic development and emergence by the attainment of a certain higher level of economic development and industrialization. Such development can be achieved and guaranteed by building a stronger knowledge economy base in Africa.
1.2 The Dynamics of knowledge Economy Interactivity.

From observations of the knowledge economy dynamics in the industrialized world, I feel justified to postulate four requirements and obligations for every African country with respect to creating a knowledge economy base and ensuring the building of knowledge society that can usher in development and ultimately emergence as an industrialized nation. Every African nation must guarantee the following:

- Production and creation of original knowledge of (economic) value, development-relevant knowledge.
- Dissemination of knowledge acquired from the global community to all areas of the national territory and dissemination of the knowledge produced locally by way of marketing nationally produced knowledge to the global community as well as to the entire nation.
- Management of knowledge-the knowledge base in various institutions, corporations and industries that contribute to the development and sustainability of the knowledge economy; proper management of knowledge within each industry and each institution and consequently within the entire nation-state to ensure dynamic knowledge institutions
- Appropriation (by the population) of new knowledge produced nationally and by the global community; appropriation of knowledge which is available for individual growth and national development needs; appropriation of knowledge which will make citizens more educated or better informed and equipped as more productive agents of development in the national economy agenda.

The four principal pillars of the knowledge economy presented above underscore the centrality of knowledge to development. Knowledge is, indeed, the life blood of development and emergence. Therefore national development managers must conceptualize development in terms of knowledge production, knowledge dissemination, Knowledge management and knowledge appropriation in order to do justice to the agenda of emergence. This model of the knowledge economy as an industry is schematized below

The four principal activities of the knowledge industry sketched below will be examined in some detail to demonstrate the role of language in each pillar; thus showing that any efforts to strategize the development and ultimately, the economic emergence of African nations that does not take on board the language question, needs to return to the drawing board if it hopes to achieve its development goal and objectives.
2.3 Language and the Pillars of Knowledge Economy Industry

Language is crucially relevant to all four principal activities of knowledge economy and therefore constitutes a central consideration in building a knowledge economy (Chumbow 2011a, 2012). The claim here is that the language factor is critically indispensable in the building of a knowledge economy (or in planning for national development and emergence), to the extent that a knowledge economy is what is sure to guarantee national development and ultimately emergence.

2.3.1 Language and Knowledge Production

2.3.1.1 Knowledge Production

Knowledge production may take different forms but the most obvious and most patent process of knowledge production is via research. Research leads to the creation or production of new knowledge which in turn enhances the economy, leading to development. Thus, development stands firmly on research, in the sense that there can be no true development without research and innovation. The output of research is knowledge, knowledge in its multi-dimensionality. Knowledge production is therefore crucially dependent on the research industry: research infrastructure and dynamic research activity. In economic terms, Knowledge production or knowledge creation may lead to what is called creation of wealth in the sense that scientific knowledge is used (as applied science) to solve identified problems and produce marketable commodities that bring in wealth and improve on the social-well-being of citizens.

2.3.1.2 The Scientific Research Process in knowledge Production

Diagram 2: Language and the dynamics of the knowledge Industry
It should be quite obvious that language is crucial to the enterprise of knowledge production; but suffice it to say that knowledge production is often the fruit of research in the sense of pure science and applied science research that extends the frontiers of knowledge through the generation of new ideas, new principles, techniques and technology and seeks solutions to identified problems of national importance or issues of value to humanity.

Thus, Research involves a complex matrix of intellectual activities of a high mental level. Innovative scientific productivity is characterized by the scientific method which in the social sciences includes the following relatively complex activities:

- **Problematization**: Identification of a research-worthy problem and reflections on its relevance, scope and potential significance, leading to the isolation, determination and clear articulation of the research problem with a researchable goal and objectives. This may take the form of an observed phenomenon that requires explanation or identified needs to be satisfied, etc.

- **Formulation of Research Questions and(or) Research Hypotheses** to drive the research enterprise aimed at finding a solution to the problem or explaining the phenomenon under investigation or satisfying identified needs.

- **Operationalisation of Variables**: conceptualization and explanation of research concepts or variables in terms of their dimensions and indicators is an important exercise in social science research, an exercise that accompanies the crucially significant enterprise of research design.

- **Contextualisation** which involves interrogating previous work and related research to be able to envisage relations and impact of potential findings and outcomes as innovations.

- **Theoretical Framework**: choice of a model which depends on knowledge, and mastery of a model (or models) relevant to and compatible with the research goals and objectives; a model or framework to be used as a guide in a carrying out the research according to acceptable norms and standards.

- **Research Design**: The enterprise by which the researcher designs the experiment by establishing (with relevant justification), who will do what, when, where, how and why? The design is aimed at collecting appropriate data from a relevant and adequate sample to answer the research questions, explain the observed phenomena or verify the research hypotheses. The design may take different routes as determined by the nature, type and form of the problem under investigation: qualitative, quantitative, experimental approaches, case studies, etc. The research design (often referred to as research methodology) has to be painstakingly rigorous in its conception so as to ensure, assure and guarantee the reliability and validity of results of the research activity.

- **Data elicitation Procedures**: They are determined by the research questions to be answered or the hypotheses to be verified and the research design; these may involve the construction of appropriate data elicitation instruments and adoption of relevant research procedures such as questionnaires, interviews, observations, documentation and constitution of corpus and corpora etc.

**Data analysis Procedures**: These vary as determined by the type of research and the research design (qualitative and quantitative procedures, etc.)

**Formulation of Findings and Results as Innovations**: Research findings are necessarily presented to foreground and show-case what is new (what constitutes an innovation) and the significance of the findings for future research, for the community and humanity as well as general recommendations.
2.3.1.3 The Role of Language in Knowledge Production

Going through the detail activities of research method above may seem fastidious and unnecessary for social scientists who are familiar with it, but it is important to recall this to demonstrate that the activity which seasoned researchers have come to take for granted is indeed a highly complex activity which cannot be properly performed without a mastery of the language used for the research.

Language and language use is fundamental in all the activities of the research method and research cycle described above in the form of conceptualization, critical thinking and analysis (qualitative and quantitative analyses) and articulation of findings, etc.

Language is used in all these activities of the research enterprise in that doing research involves summoning all attributes of the intellect from conceptualization of the research problem through the elicitation of data, to elucidation of the research problem by production of new knowledge. Chomsky (1968) has established the relation between language and the mind. Others, such as Piaget have established the relation between language and the ‘thought process’. It is now established that man cannot think without language, at least language in its primary existence as mental symbols of the process of signification in the mind (Piaget… ). Beyond the thinking process, in scientific research for knowledge production, the articulation of research ideas has to be materialized or expressed in a particular natural language mastered by the researcher. The question is, in which language can the researcher think, express and articulate the fruit of his intellect?

Given that research geared towards knowledge production is such a highly mental and intellectual activity, it is clear that the mastery of the language of research activity is indispensable to aspire to attain a good level of scientific productivity.

Therefore a language that is not well mastered cannot be used for research. Despite the use of exoglossic (foreign) languages as language of research in Africa, less than 40% of the population speak these European language at a reasonable functional level (Chumbow 2005). Out of this, it can be reasonably assumed that less than 5-15% have the level of mastery that is required to conduct high-powered research in these languages i.e., research that can systematically lead to knowledge production and innovation. If less than 15% of the population is actively involved in research, this means that Africa does not have the critical mass of its population involved in the research and research and development activities that can make a difference in terms of the production of the new marketable knowledge, knowledge that can feed the national knowledge economy agenda.

To the extent that this is true, it means as long as the language medium of research in Africa is still the less mastered foreign official language, Africa will continue to lag behind in knowledge production and lead the world in the consumption of knowledge it does not and cannot produce. Of course it is a well-known economic truism that a country that consumes far more than it produces, has an unfavorable balance of trade. This simply translated, spells the syndrome of 'heavily indebted poor country' (HIPC) which has been the lot of many African countries in recent times. (Let it be known that knowledge consumption minus knowledge production begets poverty).

3.2. Language and Knowledge Dissemination

Knowledge dissemination is 'the transfer of knowledge within and across settings, with the expectation that the knowledge will be "used". Knowledge Dissemination also refers to distribution of tangible knowledge or goods produced by the knowledge economy via marketing. The transfer of knowledge from knowledge producers to knowledge users in
various localities within and across nations, involve language to a very high extent, since dissemination involves communication. Thus, in the knowledge economy, language is the primary means of dissemination of knowledge i.e. the means of facilitating access to knowledge by those who need it. While languages of international communication (such as English and French etc.) are crucially relevant for international interaction as far as accessing knowledge from the global community is concerned, these languages are not sufficient or adequate as means of dissemination of development-relevant information and knowledge within the African nation space. This is so because all African countries are multilingual in varying degrees (Chumbow 2012b) and despite their official status, no language of the global community, (that is, no language of the colonial legacy) is a majority language in any country of Africa. This means speakers of African languages together outnumber speakers of anyone of the official languages. Dissemination of knowledge within the nation can therefore not be envisaged uniquely in a language spoken by less than 40% of the population. To do so will amount to the marginalization of the majority who speak essentially or uniquely an African language. Thus, if language is indispensable in knowledge production it is even more so in knowledge dissemination for it is difficult to imagine the dissemination in any language without adequate knowledge of the language. Access to information relevant and crucial for the individual, community and national development should therefore be by means of dissemination via a language understood by the targeted audience or population.

2.3 Language and Knowledge Management

Knowledge Management is essentially about 'getting the right knowledge to the right person at the right time'. (Alan Frost 2005) The difference with knowledge dissemination is that knowledge management ensures the storage and distribution of knowledge within an institution, an industry or corporation etc, whereas dissemination ensures access of knowledge across settings, institutions and nations.

Knowledge management may involve some knowledge creation but it is essentially knowledge aggregation, storage, retrieval and distribution or sharing within an enterprise. The overall objective is to create value and to leverage, improve, and refine the firm’s competences and knowledge assets to meet organizational goals and targets. The central question in knowledge management is: 'How can we manage the knowledge that we have in our institution so that ultimately, the institution can have a competitive edge over other similar institutions? A competitive edge readily translates into financial gains.

In knowledge management, language is a fundamental facilitating tool, as a vehicle of knowledge needed by the various actors and agents of change in the industry. It is obvious from the activities involved in knowledge management (aggregation, procurement, storage, retrieval and sharing of knowledge), that they are language-demanding and language-dependent activities. Getting the right knowledge to the right person involves transmission of knowledge within the institution and language is, as yet, the best known medium for transmission and sharing of knowledge. The language used for knowledge management has to be the language understood by all stakeholders in the knowledge management enterprise.

2.4 Language and Knowledge Appropriation

Development involves social, cultural and economic transformation. Transformation implies change. For individuals to improve on their livelihoods they have to acquire knew knowledge and appropriate innovations that can transform and change.
Perhaps one of the most fundamental challenges of African development in my considered view is: how do we get the masses of the rural population in Africa to access, examine, accept and adopt the new knowledge in economics, agriculture, healthcare, etc. that they need in order to reduce poverty and endemic diseases as well as improve on their living conditions? The answer is the appropriation of development-relevant knowledge.

I believe and it can be demonstrated that ignorance is a disease which only knowledge can cure (Chumbow 1996). If we can understand what is involved in appropriation to the extent that we can exploit that knowledge to enhance appropriation of innovations (new ideas, new knowledge in science and technology) by our impoverished populations (who squalor in misery, poverty and want), they will be able to shake off the shackles of ignorance and want and access a better quality of life with their new found knowledge. This is so because knowledge is power and knowledge empowers.

Our research on appropriation within the context of social engineering (Chumbow 2012 a) is presented in the model of appropriation below. The six stages of the model underscore the fact that the appropriation of an innovation is not an event but a process that starts with the presentation of the innovation as comprehensible input in a language medium best understood by the target population.

It goes through varying phases from awareness of the innovation through, comprehension, knowledge, spontaneous judgement (evaluation), to adoption or appropriation (with powerful indicators such as change of attitude, change of behavior and change of mindset).
In Chumbow (2010 and 2012a) it was demonstrated that one of the reasons why Africa lags behind in the implementation of the millennium development goals is because (besides other socio-economic reasons), the language factor has been neglected in the implementation of development related innovations. The key issue is that the appropriation of any innovation especially innovation in science and technology is a process in which language and comprehension play a crucial and fundamental role.

The implementation of any innovation (for instance within the MDGs) involves new (scientific) knowledge and new technologies that have to be evaluated, understood, accepted and adopted as well as new ideas (often at variance with the culture and traditions of the people) that must be apprehended, comprehended and appropriated by the masses of the population. This, in effect, means appropriation of any knew knowledge or new idea is a process involving many critical stages of which comprehension is central. Thus, Kayum (2012) found that in the implementation of the Health MDGs by sensitization or awareness campaigns, those who comprehended the messages (presented in a language they understood well), appropriated more (evidenced by such indicators as 'change of attitude', 'change of behaviour') than those who did not understand the message well.

Thus, research has established that comprehension is a *sine qua non* condition for appropriation although not a *sufficient condition* because there are other variables that
contribute to the process of appropriation. However (except in exceptional cases of imitation) it is clear that comprehension is essential and indispensable for the appropriation of an innovation including development-relevant innovations. Hence the language best understood by target populations, the mother tongue, is best suited for development communication (sensitization, awareness campaigns, information on health issues, agriculture and food security, environmental sustainability etc.)

Thus, social change and economic transformation needed for growth and development is possible if (among other things) the language of the people is used in social and economic action to ensure that they imbibe, appropriate and take ownership of innovations that trigger change and usher in development.

This section has shown that language permeates all essential dimensions of the knowledge industry from knowledge production through knowledge dissemination, knowledge management and knowledge appropriation and needs to be part of the strategic plan for national development.

3.0 LANGUAGE AND ACCESS TO KNOWLEDGE

The centrality of knowledge to development and emergence has been underscored. The relevance of language in the transaction of activities in the enterprise of knowledge economy is well established. This raises the important issue of Language in relation to access to knowledge. Since knowledge is accessible only through a language medium. What is the situation of language use and what measures are needed to ensure a greater level of access to knowledge by both elite and the masses of the populations?

It is obvious despite substantial efforts in the promotion of the instrumentalisation and use of African languages in the last decade, the medium of education in most of Africa is still largely via the exoglossic or foreign languages of the colonial heritage such as English, French, Portuguese Spanish, etc. which serve as official languages of the nation-state. The consequence of this situation is that only an estimated 20 to 40 percent of the African population is educated and functions in these languages. Therefore 60 to 80 percent speak and use essentially or uniquely an African language.

"The fact that the sum total of the information, knowledge, technology, skills and techniques relevant to and required for social, cultural and economic transformation in the enterprise of national development are confined to and transmitted in a foreign language used by a relatively small fraction of the population means that the majority (60 to 80%) who do not speak the official foreign language are literally marginalized and excluded from the development equation" (Chumbow 2005). The situation has improved since this observation was made ten years ago, but not significantly (For more on exclusion, see Bamgbose 2000, Djite 2008 and Cuvelier et. al 2007)

It is, in fact, now axiomatic that access to information and access to knowledge relevant to development is best achieved in the language of the local population and that empowerment of the rural masses for national development cannot be achieved in a language they do not speak, no matter its official status and its international standing in the universe of globalisation.

3.1 The Paradox of Availability versus Accessibility of Knowledge
The dissemination component of the Knowledge economy for African nations envisages the dissemination of the knowledge from the global community and locally produced knowledge to the populations with the expectation that they will appropriate this knowledge for the enhancement of their own economic development and social well-being. Both the knowledge from the global community and locally produced knowledge is presently, for most countries of Africa, produced and disseminated uniquely in exoglossic official languages (English, French Portuguese, etc.). In these circumstances, this knowledge is accessible at best only to a minority of the population that masters these languages. The majority who speak uniquely or essentially a national languages are excluded because *knowledge is available but not accessible*

### 3.2 The Paradox of the Inaccessibility of Open Access Knowledge.

Even Open access knowledge (which is open and free because it is expected that it will be accessed potentially by everyone), is not accessible to the majority of Africans. We thus, have in Africa, a paradox where knowledge that is available, free and needed by the population to extricate themselves from the pangs of ignorance, poverty and want is *free to be accessed but is not accessible* because of the language barrier. This is a serious problem that requires a special language policy and planning paradigm as a long lasting solution to access to knowledge by the majority.

### 4.0 THE AFRICAN PRAXIS FOR THE MAXIMIZATION OF ACCESS TO KNOWLEDGE

The above paradoxes call for a rethinking of the development paradigm for Africa to include a systematic facilitation of access to knowledge by the masses of the population in the knowledge economy structures. Elements of the paradigm are discussed in this section.

#### 4.1 Sustainable Development

Sustainable development is often presented as the ideal form of development for all nations because it encapsulates some fundamental values and virtues. According to the World Commission on Environment and Development (WCED 1987:43), the concept is presented as follows: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

Many observers believe that *participatory democracy, un*-dominated by vested interests, is a prerequisite for achieving sustainable development (Mintzer, 1992)

The details of the articulations of the concept of sustainable development as envisaged in the 18 principles of Sustainable development of the Rio Summit and the recent revisions of the Durban Conference are relevant in the articulation of sustainable development policies for any nation.

#### 4.2 Redemptive Development

Development should be redemptive in that development principles are geared towards ensuring even development as much as possible across the national territory so that the fruits of
development benefit the majority and not only the minority. Redemptive development will thus insist less on the per capita income as indicator of progress and more on the minimum standard of living. It will reduce skyscrapers in the capital and other cities and save resources to wipe out slums in other parts of the city and reduce gaping poverty in the rural milieu by a policy of a systematic urbanization of the villages, etc.

4.3 Participative Development

It is our considered view that in the African context, sustainable development has to be enhanced and implemented by commitment to participative development. Participative development is development anchored on social dialogue between government and the governed; between agents of development and beneficiaries of development initiatives. Without such a permanent dialectical dialogue, development initiatives from the top may be perceived to be misconstrued and consequently ignored or rejected by the masses.

The Top-Down model of development where development projects are conceived from the top or outside the community and executed for the community without community participation and involvement has been stigmatized. In fact, it may fail to lead to the appropriation of development principles. Its opposite concept the Bottom -Up model in which communities initiate projects for assistance and funding by the top, (in spite of visible advantages over the Top -Down model ), is also wanting in that, (among other reasons), it is predicated on the unjustifiable and unjustified assumption that only the bottom or the local communities know what is best for them.

The fact is that significant development inputs of value and interest to any community may be initiated from the top, the bottom, the centre or from outside the territory. No one has a monopoly of good and innovative ideas. What is important, however, is that all development initiatives from whatever origin should involve the participation and involvement of the potential beneficiaries at all levels of conception and implementation of the project by way of social dialogue on the value, merits and advantages of the project or innovation. Participation should lead to a better understanding and consequently, the appropriation and proper use of the project for the intended purpose.

4.4 Participative Communication

Genuine social dialogue of the type required for participative development is necessarily interactive: the top making an effort to understand the aspirations and needs of the communities below and the later trying to understand the rationale and raison d'être of government action. Interactive social dialogue means interactive communication in a language that the masses, the potential beneficiaries of the development project can understand so as to express their views and ask questions for clarifications relevant to change of attitude change of behavior and appropriation .

Participative communication for participative development entails the use of the language of the people (the language the people understand) in the social and economic interaction with the people on development issues; the use of the language of the people in the development discourse; the language of the people in development initiatives and throughout the development implementation process.

This therefore means that participative development via the participative communication approach advocated for here, is not the unidirectional transmission of information from the
government and its agents often in the official language not mastered by the masses, but an interactive bi-directional exchange and structured dialogue in the language known to the people, the target audience or interlocutor. Participative communication *ipso facto* encourages feed-back from development beneficiaries and target groups; thus, favouring appropriation of innovations and ownership of development initiatives and projects.

Efforts to effect (participative) development by the use of a foreign medium of communication (English, French, Portuguese, etc.) no matter how official and international, remains a benevolent monologue to the deaf if the target audience cannot understand the intended development message well enough to react appropriately by way of appropriation and adoption of the new development ideas in the message.

In fact, we have shown by empirical evidence, that the slow rate of implementation of some millennium development goals (MDGs) in the rural communities in Cameroon, especially the health millennium goals (such as reduction of infant and maternal mortality etc.) is due in part, to the absence of effective participative communication (Chumbow 2012 and Kayum 2012). When, for instance, communication on best practices in prenatal care and care of neonates is effected (to would-be mothers) in the foreign official languages (English and French, etc.) with occasional translation instead of the direct use of the language of the villagers, there is no interactive communication. Therefore comprehension is not guaranteed and consequently appropriation of the life-saving innovative message communicated cannot be expected because ‘comprehension is a sine qua non condition for the appropriation of new ideas, new knowledge’ (Chumbow 2010). The result of non-participative interactive communication of this useful knowledge is ultimately a stagnant or slow rate of reduction of infant mortality and/or maternal mortality.

*There can be no effective participative development without participative communication in the sense of* interactive communication in the language of the target audience. This is so because as mentioned above *comprehension* is a sine qua non condition for *appropriation* of any innovation (Chumbow 2012, Kayum 2012). A new idea or new knowledge in science and technology cannot trigger a change of attitude, a change of behaviour and change of mind-set if it is not the result of *comprehensible input* in the sense of Krashen 1981 and if ultimately it is not understood.

4.5 Language Policy and Planning Model

A language policy and policy implementation paradigm predicated on a fundamental language policy of the development and use of Africa’s language for Africa’s development in partnership with global languages of the colonial legacy is what is needed.

4.5.1 African Languages –Global languages Partnership

African countries have to develop instrumentalize and use African languages in partnership with official languages of globalization (English French Portuguese, etc.) to improve access to knowledge relevant to development. This policy was prescribed by the Organization of African Union (OAU 1986) and re-iterated by the African Union (AU 2006). However, it is has not been well implemented’ It has, indeed, been neglected by many, while others pay lip service to the policy. What is required is the faithful implementation of the Language Plan of Action for Africa (AU 2006)
4.5.2 Language Planning by an appropriate Model to ensure the judicious consideration of sociolinguistic and sociocultural variables in language policy and implementation for national development: Language in education policy, language standardization, instrumentalization, revalorization, revitalization, intellectualization etc to enable African language to be fit and ready to perform new functions along with official languages (See, for instance, the Tier stratification model of language planning for Africa Chumbow 2009 and 2012)

4.5.3 Principle of Complementarities of Functions
It has been proposed that minority languages should be attributed economically valorizing functions (functions of economic value and importance). See Alexander (2004), Bamgose (2004), Chumbow (2005), Tadadjeu (2007). The Principle of functional complementarities (Chumbow, 2009, 2012) states that at the level of status planning, all languages of the nation-state should have their identity function (the primary function) and be allocated some other economic valorizing functions (education/literacy, media, public administration, parliament, business/commerce etc.) necessary to ensure the vitality and maintenance of the language and its contribution to the national development enterprise. This principle has a lot of advantages in enhancing the vitality of the language and ensuring it development and use in the interest of the local population.

4.4.5 Principle of Attitude Engineering
The success of the implementation of the language policy depends crucially on understanding the dynamics of attitudes towards the language policy so as to take measure favoring the implementation of the policy.

By attitude engineering we mean the systematic use of sociolinguistic and psycholinguistic knowledge, principles and techniques to determine attitudes of government and the speakers of various languages in a language contact situation and the use of the findings as input for the design and implementation of a programme to effect polarisation of attitudes in the direction of a desired policy outcome. This is best achieved by way of social dialogue, involving a bidirectional participative communication in a language mastered by the target population. Attitude as a bidirectional interaction process requires monitoring responses as feed-back and modification of input by orientation in the direction that should yield desired result of a social engineering process: change of attitude, change of behaviour and ultimately change of mind set.

4.5 Access to Knowledge Laws and Language Laws
There are international laws on Access to information but no law on Access to knowledge. Since it has been demonstrated that access to knowledge is fundamental to development there should be advocacy for a law on Access to knowledge to ensure the democratization of access to knowledge by the implementation language policy duly articulated by a language charter or language Law (Chumbow, 2013). Indeed, the paradox of the language factor in Africa where not even ‘free access knowledge’ is actually accessible is predicated on retrogressive language policies, lack of vision and political will. There is therefore a need within the African praxis for Access to knowledge laws geared towards the democratization of access to information and knowledge. The existence of Access to knowledge laws will safeguard and stem impunity and lack of political will required to make knowledge available and accessible via language media that are accessible to the majority of the population.

4.6 Institution and Empowerment of a Translation Industry
The existence of an Access to knowledge law will lead naturally to the organization, structuring and empowerment of translators and interpreters in the languages of partnership for participative development of the enterprise of translation and interpretation. The finality of the Translation Industry is to ensure that knowledge (from whatever source), including especially open access knowledge, is actually accessible to the majority of the population.

CONCLUSION
Not only does Africa lag behind the world in knowledge production in the age of knowledge economy, even free open access knowledge from the global community is not accessible to the majority of Africans because it is available in an official Language that is not accessible to the majority. Given, the crucial value of knowledge in a knowledge-based economy, there is a rethinking and reconceptualization of development plans for Africa that focus on a partnership between languages of global communication and African language; a partnership grounded on principle of participative development via participative communication guaranteed by well-motivated laws on Access to Knowledge.