

## Water Resources Utilization as a Way Out of Economic Recession

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### Abstract

The paradox of rich natural endowments but poor economy has been the label of most African countries. This paper examines the utilization of water resources within Nigeria territory as a means for addressing economic recession. First, an overview of the pinches of economic recession was presented. The literature presented examined the properties of water as perceived in chemistry, biology and physics. A set of challenges encountered in the course of utilizing water resources were identified from economic point of views and possible scientific means to get adjusted as a collective responsibility were proffered through the adoption of the tenets of constructivism in all works of lives, reassessment of the education system to adopt technology capacity building curricula and the investment on the human factor among others. Among the recommendations stated reflect the formulation of policies that would portray a process of transmission from ordinary ways of rational disposition to embrace practical scientific ways of modeling and the focus on how to process information across many content areas by interacting productively with the resources around.

**Keywords:** *Challenges, Economic Recession, Human factor,  
Natural resources, Policy*

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### **Background to the Study**

The various economic problems of recent years have stimulated serious debate about the proper role of public policy. Parties on the political left in Europe have advocated more controls and more planning. This prompted different solutions offered in 1980s by the Conservative Party government of Prime Minister Margaret Thatcher (United Kingdom) and the Republican administration of President Ronald Reagan (U.S). The two countries attempted to diminish taxation and government regulation on private enterprise to: enlarge the potential profits of corporations, encourage additional investment, enhance higher productivity, and renewed economic growth.

There were however, divergent opinions as to how long sustained economic growth can continue. Optimists remained resolute on the ability to improve crop yields and enhance industrial productivity through technological innovation. Pessimists lamented on thinning resources, unchecked population expansion, extreme military expenses, and the unwillingness of rich countries to share their affluence and proficiency with less fortunate nations. These positions could have led to the believe that Government instability, endemic corruption, and wide swings in economic policy made the Third World's economic prospects seem even less favorable in the 1990s and may end up in recession.

Economic recession or contraction phase of business cycle is characterized with critical fall in: production, employment, wages and business profits. Any nation affected by such contraction therefore is under threat of collapse or depression and like the application of antitoxins in diseased condition, economic policies that would turn the tides have to be implemented to safe the 'goose'. Most advanced countries have got to strangulate one time or the other on their path to economic merchantry.

At the moment Nigeria has got to taste the noxious delicacy that pricks the senses of the inhabitants as the aspiration for greater economic breakthrough is yearned for. But as science teaches, finding solutions to everyday problems are quite possible. Among such struggle to overcoming economic challenges by humans is in harnessing the resources of which water is one within the immediate environment.

### **Statement of the Problem**

Several efforts have been made by man to tackle everyday challenges. Part of such efforts is to explore and exploit the resources within the immediate environment in meeting economic demands. However, the exploitation of natural resources has not occurred without its accompanied and accumulated challenges. This is why this paper examined the utilization of water resources as a way out of economic recession in Nigeria.

### **Objectives**

The focus of this work is to examine:

- (i) The properties of water that Nigerians need to explore for its resources to serve better
- (ii) Identify the challenges encountered in the course of utilizing water resources
- (iii) Offer remedies on the challenges confronting Nigerians in harnessing water resources as a means for tackling economic recession

### **Definition of Concepts**

**Challenge:** is a state of confrontation that demands justification for an experience.

**Economic recession:** is a period of contraction in business cycle.

**Natural resources:** are materials occurring in nature for people to make use of.

**Policy:** is a programme of action adopted by the government on any particular event.

**Science:** is the study of physical and natural world through the use of systematic observation and experiment.

**Water:** is the liquid state of the hydrogen-oxygen compound ( $H_2O$ ).

### **Literature Review**

Water is the most important resource in the world (Chang, 2005). A British chemist Henry Cavendish in 1781 had synthesized water by detonating a mixture of hydrogen and air. This result was substantiated by a French chemist Antoine Laurent Lavoisier who proved that water was not an element but a compound of oxygen and hydrogen. Other chemists have offered their consolidating findings. Chemists agree that pure water is an odourless and tasteless liquid with a bluish tint, detectable only in layers of considerable depth (Chang, 2005). The physical properties of water forms the basis defining the calorie and specific and latent heat as well as in the metric system for the original definition of the gram (unit of mass). Water can combine with certain salts to form hydrates; reacts with metal oxides to form acids and acts as a catalyst in most essential chemical reactions. Water can exist at ordinary temperatures in all three states of matter (solid, liquid, and gas). Water accumulates in rock interstices beneath the surface of the earth under the influence of gravity as a vast groundwater reservoir to supply wells and springs and sustains the flow of some streams during periods of drought.

The role of water during hydrolysis in living cells is germane for the metabolic breakdown of essential molecules like proteins and carbohydrates to yield adenosine diphosphate (ADP) and phosphoric acid (Roberts, 1980) which are basis for the energy needed by the body of organisms. It is possible to partly explain water's strange and life-giving qualities by quantum mechanics as claimed by a group of physicists in the UK and the US. This position came to bear having made extremely sensitive measurements of the protons in tiny samples of water and found that these protons behave very differently to those in much larger sample.

People's knowledge about water from science learning especially as revealed from its host of properties set it apart from other substances and which make it particularly suited to sustaining life. This is buttressed from the fact that it is less dense as a solid than as a liquid and that its maximum density occurs at 4 °C, which makes lakes to freeze from the top-down rather than the bottom-up – something that has been vital to sustaining life during ice ages (Bawer & Westfall, 2014).

The findings of Georghiades (2002) in his study on science education has it reliably stated that the strategy employed in learning helps a lot at promoting better metacognitive understanding and intentional learning required to produce more desirable conceptual

change and retention about any phenomenon/concept in science education. People would need to be provided the enabling environment, have access to resources related to the concepts learned and able to communicate their thoughts. This agrees with the proponents in science that communication may support thinking by compelling learners to organize their thoughts, lending structure to their arguments and helping to integrate new information with background knowledge (Hayes, 1987).

Hitherto, there are trends in research and literature that supported the active involvement of learners in the learning process while de-emphasizing the role of the teacher (Von Glasersfeld, 1993; Davis, 2001). This is why policies which are suitable for empowering the citizenry by dispelling erroneous and idle pre-conceptions but actively engaging one in investigating phenomena through hands-on activities would be the better option for resolving possible underperformance at any moment of national development. Whenever people cultivate this as a habit, it would cause everyone to reflect on their background experiences into a work force and take necessary action to adjust such as much as appropriate.

Science as a body of knowledge has assisted the human creature to naturally acquire skills in dealing with circumstances of ill-will. The efforts of German Physician Emil Adolph von Behring in 1890 in discovering antitoxin (Encarta, 2009) backup the credits accorded the practice of science as problem solver. Antitoxin is the antibody capable of neutralizing specific toxins which are causative agents of diseases (Oxford Dictionary of current English) that is produced in the bloodstream of an animal or human in response to the presence of a bacterial toxin or poison. Antitoxin usually is meant to block the effects of the toxin if given in time. As toxins are responsible for disease conditions, so it is for economic recession on human impoverishment and all its battery of calamities.

### **Challenges with Harnessing Water Resources**

In spite of the enormous efforts made by science educators at consistently instilling public awareness and recognition about water most especially through school science curricula, it continues to be under-appreciated and undervalued (Hargreaves, 2010). In view of the abundance so to write of water, everyone have not recognize, consider, utilize, manage, and view the finite resources therein in water as anything that should be treasured. The supposed significance of water properties as well as clean and safe water for public health and healthy ecosystems, for the nation's economic well-being, and for the wellbeing of families and communities have always encountered some limitations due to deprived consideration for human factor in the constitution of the land.

In like manner, many Nigerians are ignorant of the law. From the perspective of International law, natural resources belong to the people. This was why Wenar (2007) argued that as a matter of near-universal principle, a people's right to their natural assets is a human right proclaimed in major documents of international law and preserve in many national constitutions. The contents of this constitution are not within the comprehension of the average populace and as such they at skeptical about the extent to which they can harness the natural endowment in their domain.

Similarly, there is the challenge of how Nigeria would emancipate its economies from the dependence on natural resources to get on the gradual accumulation of productive and innovative knowledge. This challenge remains a cankerworm in our fabrics because the

education system inherited from the colonial period and the accompanying reforms notwithstanding are in many instances inadequate for tackling the current challenges of acquiring the needed productive knowledge because the system has been: (i) oriented towards cruel resource exploitation, and (ii) majorly theoretical.

Outside the human person, Nigeria freshwater resources ebb and flow seasonally with considerable mounting pressures from drought, flooding, population growth, pollution and the intra as well as inter species competitions occasioned by ecological system protection, drinking water, agriculture, energy production and recreation. All these converge into the extensive engineering, biological and logistic challenges confronting Nigerians about their water needs. Without pretence, people residing along the river courses or the coastal belt are still inundated with such challenges.

We also deduced that before the World's financial crisis, there were high prices of natural resources and other principal produce in international markets. This had tempted economic analysts to suggest that resource-rich developing countries in Africa where Nigeria locates and Latin America had ultimately reached a unique opportunity to jump on a high-growth of industrialization and development path (Scarpetta & Tressel, 2002). However, this affirmation failed because Nigeria have not succeeded in managing the revenues accrued from the natural resources in a long term sustainable manner by attempting to invest in the creation and acquisition of new knowledge.

Furthermore, Nigerians crude knowledge regarding how to transform raw materials is another main source of the long-run terms of trade disadvantage for the dependence on resources from the water body since the price would always collapse at the onset of a recession. This was why Friedrich List denounced the failure to break out of the vicious circle of overdependence on resources as the source of weakness that grant those who possess more production knowledge the advantage to force the weaker ones to relinquish their powers of production, freedom and independence (Alexis, 2009).

As a severe new tax would infuse reduction in purchasing power in business cycle, so would higher prices of devices for exploring water resources at recession. Forceful reduction in purchasing power of ordinary people with its battery of reactions has usually been connected with depressed sales of consumer items. The aftermath of this of course has been manifested in the laying off of many factory and sales personnel in business cycle. This vicious procedure has a spiraling effect in all sectors of Nigeria economy.

Also, structural problem is taken to be one of the side-effects of the resource boom. Water, like other natural resources is exported at considerable levels. Thus, the exporting communities in most cases are not shielded from any of the indirect harmful effects. Experts in Economics believe that booms can indirectly harm the economy since the capital and labour that could have otherwise been used in the manufacturing sector are pulled into the resources sector and demand in the non-tradable sector become increased by domestic revenues from such natural resources (Bornhorst et al, 2008). Accompanying such blooming sector is increased national revenue due to higher government spending which increases real exchange rate and rise in wages. A shift of resources across sectors after the boom tends to hinder and shrink innovative and tradable sectors respectively.

The abundant flow of water resources in Nigeria has attracted various national powers among the citizenry. Similarly, there are local forces that have sought to gain an easy advantage by tapping into and using water revenues to acquire wealth and destabilize ecological system. A number of major human rights groups have documented how individuals and foreign corporations have made enormous profits from water and have developed networks of key political, military and business elites to organize the plundering of Nigeria's water resources. A survey along the major rivers will convince the concerned about the torture and other human rights abuses that followed the scramble to exploit water wealth with the claim of ownership.

There are also the devastating effects of violent conflicts that arise from the scramble for the control of water resources. Alexis & Luc (2010) presented the opinion of Nobel Prize laureate Simon Kuznets about the abundance of what he called “fortuitous gifts of nature”, which can hardly be perceived as contributing to economic development within context where the resource-endowed communities merely exploit their natural wealth to export it as raw materials. As it is well-known that in addition to disruptive and political dominance aspects, there are traditional economic channels through which resource endowments of the like as water might hinder the long term economic development of a nation.

Available evidence on the way communities along water ways have exploited water resources like the fish, crabs, lobsters, lilies, lettuce and the likes and in transportation so far shows that this exploitation has hindered development since it has not encouraged economic diversification and has delayed the accumulation of adequate human capital stocks needed to put the country on the innovation driven growth path. At the present recession, the exploitation of water resources in many parts of the country has generated conflicts, which have impeded capital accumulation and left this country in a self-reinforcing mechanism of dependence on the export of raw materials which has been the bane of Nigerians poverty traps.

Findings from Empirical research have indicated several mechanisms through which a negative relationship between natural resources and economic growth might operate. Among such, social mechanisms reflect the perception of resource endowment as “easy riches” that makes people like the “alimajirai” in the north and the Nigerian youths living along water courses lazy and tempts them to neglect education and other productive investments that culminate into having a direct bearing on hindering innovation and investment in productive knowledge. This adds to other, the economic and political mechanisms, which infer that resource booms limit structural diversification and technology accumulation by creating opportunities for mismanagement, rent-seeking and corruption that undermine effective spending of windfall gains.

### **Way out of Economic Recession with Water Resources**

In view of the challenges confronting average Nigerians at recession enumerated so far, we observe the following implications for improvement. It is in our opinion that, giving consideration for human factor in the nation's constitution would release everyone from economic contraction. In the word of Gylfason (2010) human factor is a parameter which reflects the most effective factors for economic improvement and national revitalization as against the natural geographic and mineral resources of any given society. One way to give consideration for human factor is to try out what Germany and Japan explored during their frustrating periods. These countries got improved through their ability to mobilize their

human resources with the basic willingness of the workers to work and got paid for what they wanted as well as the high standards of technical expertise, American markets and investments.

Nigeria would need to adopt as well, the recent economic growth theory which suggests the interaction of several sources of economic improvement as important for development. For this to be relevant, the conversion of natural capital to human and social capitals to boost development would be required, or is at least helped by, good institutions and governance. Likewise, investments in human capital and social capital tend to interlock and reinforce each other. Lee (1998) had given two helpful types of growth classification and stated herein as that which is (i) been extensive and driven forward by the accumulation of capital, as well as (ii) intensive, springing from more efficient use of existing capital and other resources.

In view of the misleading skill acquisition in the education curricula, we advocate an innovative knowledge that would be geared towards economic diversification into productive activities. This would enable Nigerians to efficiently use the resources around them to produce valuable goods and services that can withstand the competition in the global markets. Also a reassessment of the adequacy of the whole education system would be required to adopt painstaking technological capability building in the curricula from the primary to the universities in the struggle to acquire technology-related knowledge.

Since ignorant has prevented people from identifying their rights appropriately, we do suppose therefore, that if adequate knowledge of the law with regards to water resources is made available in a simplified copy to the populace through the social media, it would re-orientate Nigerians against the current dehumanizing economy. From time immemorial, countries like Israel and Egypt have taken substantive advantage of the water resources available at their disposal and this could serve as palliative to Nigerians if citizens' rights are preserved by the policy of the land. The strategies adopted by these countries included: accumulation of human capital through education, on-the-job training, health care, and empowerment through free trade, to break outside the boundaries of their production frontiers (Al-Marhubi, 2000; Amin et al, 2000).

We equally explored Israel's approach in meeting their water needs and harnessing the resources imbedded productively via innovations that helped them overcome extensive engineering, biological and logistic challenges. Today, Israel's New Tech programme has ever promoted them as a global water technology leader simply by investing in human capital, research and development, marketing, and start-up growth and international activity. This programme has achieved great success in the local development and global export of Israel's innovative water technologies. Policies aimed at promoting such innovations could therefore be required to first empower able bodied Nigerians and second boost sustainable economic growth.

Nigerians can improve at recession and assumed to possess an enhanced comparative advantage over others and earn favourable evolution of terms of trade if we metamorphose to exporters of manufactured products rather than retaining the present raw material exporting country appellation. Thus innovation and diversification into finished products would have to be accorded the utmost relevance rather than been viewed as counterproductive. Though, at the moment diversification has been the slogan of the

government, its resourceful actualization as rectifier of Nigerians attitude towards boosting the economy rather than its polity is required.

We equally concur here that it is expedient that Nigeria Government is mindful of the depth of List's message about failure to break out of the vicious circle of overdependence on resources. Since such dependence is the source of the weakness that grants those who possess more production knowledge the advantage to force the weaker ones to relinquish their production powers, freedom and independence. A policy in this regard that could prevent possible economic suicide is required since the only ultimate long term source of power to reach prosperity as identified here is production knowledge.

The government is expected as a matter of urgency to extend hands of expertise to assist in the improvement of potentials in local crafts designers with the materials needed to meet competitive and sustainable devices applicable in water enterprise. We also deduced that it was important to live near the Nile in ancient Egypt for many reasons. First, flooding or inundation that occurred on a regular basis usually came with some major positives. People relied on the waters to nourish crops in the fertile soil that would result in the delta. Hence, locations of river bank depressions along their courses in Nigeria could be transformed into canals through which water can be channeled to flow far into the interland during high volumes. This can in addition to reducing the havocs of excessive flooding, serves other people in meeting the water requirements for their agricultural activities in the interland and for water conservation as well. Just as there are agencies on surveillance on roads, policy that would cause those in charge of water ways to extend their roles to the inter-land would be required.

In order to address the volatility in illegal export revenues that hamper effective economic planning and investment with respect to the water bodies in every state, we propose that each state government endowed with a body of rivers either as source or course prepare a work plan in this regard. Such work plan/policy would be to entrench improvement in investment in human capital and the employment in intensive as well as inclusive growth and development pattern. Such policy would need to guide against the temptation that the availability of high amounts of natural resources in the economy of the country might tend to be associated with the crowding out of social and human capital, which might prevent impeding a pattern of more balanced economic growth and human development.

Finally, it is on record that Israel's agricultural sector has transformed into one of the world's foremost leaders in water conservation (OECD & FAO, 2012). Nigeria economy could as well be transformed from the endowed water bodies flowing within the territory if Nigerians avail themselves the willingness for reorientation and investment in productive knowledge. Such transformation could explore the tenets of science education in valuing water through a conceptual change to an extent of making it sufficient enough for manufacturing, clean-up and exporting a substantial proportion of its products competitively at the highest ratio globally. To improve productivity efficiently on a sustainable level, well purposeful markets would be needed to offer a clear price signals that reflect the scarcity value of water resources both individually and collectively.

## **Conclusion**

It is clear from the content of this paper that as far as Nigeria is concerned, there is not much issue with policy formulation rather its shabby implementation, insincere feedback

and corruption are the bane of all economic woes befallen the nation. The nation's educational policies which may be assumed to possess good ingredients for people's empowerment with regards to skills and training for self-reliance have remained a mere principle devoid of concrete actions and implementation (Akpotu, 2009). The failure to adequately capture and enforce a means to cater for majority of able Nigerians wondering outside the school system also constitutes a barrier to developing the potentials in all the citizenry. The fact that Nigeria is endowed with water resources is an opportunity for many to diversify productively to improve economic competitiveness and economic growth in wealth creation, poverty reduction and self-employment if everyone could develop a productive rather than an exploitative conception.

Nigerian agricultural activities along river courses would need to rely on the inundation positives for the land forming the bank and invariably the alluvial plain emanating thereof. Thus, the inclusion in the curriculum the desire to acquire the ability to better predict the annual inundation by individuals would therefore be required for consideration. Just as the Nile offered other food like the fish for the people, the Nigeria Rivers could provide fish nutrition requirements of the country that permits the people to thrive and the population to grow, thereby supporting the rise of a large and more organized civilization.

As Nile River served the major means of transportation for ancient Egyptians, policies capable of harnessing adequately coordinated means of how goods and services could be traded along the routes provided by the waterways would be necessary. This again calls for adequate utilization of revenues on innovations like scooping the river courses to provide depth for more water volumes and free flow. This innovation would invariably lead to the development of a variety of vessels in addition to reducing congestions and pressures on roads and parks.

### **Recommendations**

1. Conceptual change policy that portrays a process of transmission from ordinary ways of perceiving, directing attention, conceptualizing, reasoning, and justifying by modeling the compromising individual's prior orientation to accommodate new practical scientific ideas should be formed and enforced.
2. The government policy at the moment should focus on how an individual within Nigerian groups can process information across many content areas by making them to be actively engaged in exploring, experimenting, creating, applying and evaluating, as well as interacting productively with the resources around them.
3. Creative policies for harnessing innovatively the abundant water resources in the country should be formulated to assist people to take charge of their economic requirements.
4. The government's role needs a shift from one playing the politics of propaganda to a catalyst that stimulates people's active participation in the production process by exposing them to attitudinal change policies which permit everyone to examine individual preconceptions about crude exploitation and ameliorate these where they run parallel with more effective and plausible conceptions that reassure sustainable economic boom.

5. The nation's educational policies should possess good ingredients for people's empowerment with regards to skills and training for self-reliance in concrete actions and implementation.
6. A policy to adequately capture and enforce a means to cater for majority of able Nigerians wondering outside the school system should be formulated and enforced to help in developing the potentials in all the citizenry.

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