Understanding the political economy of knowledge interchange between the scientists and policy makers in the water, sanitation and hygiene sector in Nigeria

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Abstract

Water, sanitation and hygiene (WaSH) services are critical public health issues, which are best handled by the State through public financing and regulatory mechanisms. But how do State agents or policy makers cooperate with scientists in addressing WaSH challenges in Nigeria? This paper examines the relationship between scientists and policy makers in relation to water, sanitation and hygiene management in Nigeria from the prism of the political economy. The study depended on elaborate and secondary review of institutional arrangements and process mechanisms for the production and communication of scientific knowledge/data into the policy domain. Much emphasis was paid on the political interests/commitments, economic incentives and the enabling platforms for transmitting available scientific data into the policy domains as well as the extent of utilization of such data in framing enabling policies in the WaSH sector. Additional methods of data collection came from the researcher's fieldwork experiences in the WaSH sector and in depth interviews of relevant interests. The study also benefitted from discussions from two public lectures delivered by the researcher at the University of Uyo (May 31st and June 21st 2016 respectively) on this theme. The two public lectures attracted top government and policy makers in the WaSH sector, academics, students and members of the civil society groups. Findings demonstrate extremely poor relationship between the scientists and policy makers reflecting in poor utilization of scientific data in framing public policies. Most WaSH policies tend to be driven from dominant international agenda with minimal or no inputs from the local scientists. Politics of service, economic interests of public servants and a lack of capacity at individual, institutional and science domains theoretically and empirically accounted for the observed findings. It is argued that the inability of WaSH related policies to benefit from local scientific inputs potentially limits progress in achieving and evolving local solutions to WaSH challenges in Nigeria in particular and sub-Saharan Africa in general.

Keywords: Science-policy interface, WaSH performance, public health, Nigeria

Introduction

The political economy framework can usefully be applied in any sphere of research and analysis touching on power, politics, institutional configuration and governance dynamics. The near universal appeal of the concept relates to the question it asks and seeks to answer, which fundamentally rests on politics and decision making, actor interests and power relations as well as decision incentives. Rarely has this concept been mobilized in the analysis and understanding of the dynamic processes mediating the interchange between scientists and policy makers. Progress in development and policy decisions theoretically and practically should depend on the existence of a functional mechanism for the dynamic exchanges and co-production of knowledge that encourage evidence-based decisions, and sound innovation (Gormley-Gallagher et. al 2014), while minimizing wastage of research results (Quevauville 2010).

Securing improved access to water supply, better sanitation service and sound hygiene settings is at the core of the Global 2030 Agenda for Sustainable Development. Achieving this goal however depends on the extent to which policy decisions reflect available scientific evidence. This thinking is extremely relevant for sub-Saharan Africa (SSA), which is still grappling with high morbidity and mortality rates (over 83% of the global population without access to improved water supplies and sanitation services are concentrated in SSA) due to lack of access to improved water supplies and sanitation services (Salam-Blyther 2012). The fundamental question relates to the mutuality of relationship between the scientists and policy makers in addressing the issues. For SSA, the question of science-policy relationship takes a complex dimension reinforced by the interplay and influences of complex cultural tradition in the arena of bureaucratic decisions and institutional performance. How would such context affect the optimization of scientific knowledge in policy decisions? This paper addresses this and related issues in Nigeria.

Nigeria's water, sanitation and hygiene stories

The water, sanitation and hygiene sector constitutes one sector of greatest interest in Nigeria's socio-economic development challenges. Different perspectives of the problem range from supply sources, spatial access, human capacity and management challenges. Average statistics suggest about less than 40% of Nigerians have access to improved drinking water supply, but the sanitation sector remains poorer. By WHO/UNICEF (2010), improved sources of drinking water supply revolve around pipe-borne water, public tap, borehole, protected spring and protected dug-well; while improved sanitation is sustained through piped sewer system, septic tank, pit latrine, ventilated improved pit latrine. With most Nigerians on low daily income bracket, the economics of accessing improved drinking water and sanitation services open up a choice between improvement and complacency with the statusquo.

At the spatial level, urban and semi-urban areas suffer the worst forms of WaSH challenge. A typical Nigerian urban centre is characterized by deep social and economic inequalities in housing, sanitation, income and other public social infrastructures. The rich and high income individuals are more likely to reside in

high quality public and private Housing Estates with relatively improved supplies of essential utilities including WaSH related infratructures and services. The low income citizens are more likely to be found in slum dwellings with poor/absence of a coordinated public WaSH infrastructures and services, forcing a high dependence on private commercial WaSH services and supplies. According to Water Supply and Sanitation Interim Note (2000), no urban areas in Nigeria (except part of Lagos and Abuja) have sewerage systems. Improved access to WaSH services depends on individual and group/communal efforts anchored on private water provision through boreholes for home and commercial utilization. Securing access to improved WaSH infrastructures in Nigeria's urban location is, therefore, more of a function of individual financial power than State effort.

WaSH vulnerable locations and homes or situations in Nigeria's urban areas also depend on individual socio-economic capacity to appreciate the health and economic nexus of inappropriate WaSH behaviours. Most urban residents' WaSH attitudes are shaped by cultural background than knowledge of reality. WaSH issues are still associated with the spiritual and religious meanings as well as some myths and values that encourage inappropriate behaviours (Akpabio 2012).

Nigeria's urban WaSH situations also depend on public policy interest and the configuration of existing institutional arrangements. State's urban WaSH policy direction still depends on past colonial practices of 'special interest areas' and discriminatory services that tend to privilege certain urban areas over others. Government quarters, public housing estates and high income residences constitute the priority targets for the provision of drinking water and sanitation services. Public health interest of resident public officials and individuals' financial capability as well as political leverages form important considerations on access to urban water and sanitation services and infrastructures.

The questions of who decides, where to locate and who to supply critical urban water and sanitation facilities and services fundamentally rest on economic incentives and political interests of the State actors in the decision arena. In this context, the practices of rational planning based on scientific facts, stakeholder considerations and 'need assessment' in the allocation of critical urban water and sanitation infrastructures are often subsumed under political and economic interests of pandering to political support base and clientelistic network or advancing the ideology of neoliberal capitalism. The primary interest of this study is to understand how the politics and economics of providing urban drinking water and sanitation services have challenged the capacity for evolving the culture of interrelationship between the scientists and policy makers in the WaSH services sector in Nigeria.

Science-policy relationship in the WaSH management sector reflects the interface of communications and negotiations between scientists and policy makers in a manner that allows for dynamic exchanges, co-evolution, and joint construction of knowledge that both enrich decision makers (Jasanoff and Wynne 1998, Gormley-Gallgher et al 2014) and foster further scientific research. The structures and functioning of such relationship depend on the nature of the political-economic orientation of the State, which has the capacity to enhance or constrain effective communication and mutual cooperation.

How the study was conducted

This paper is a product of several studies on water, sanitation and hygiene (WaSH) on sub-Saharan Africa (Akpabio 2012, 2016, Akpabio et al 2007). Major sources of data were based on fieldwork, discussion forums/stakeholder meetings, personal interactions and interviews, and a review of secondary literatures. The choice of the topic was inspired by the IWRA's project on strengthening science-policy nexus to address the impact of climate change funded by the French National Agency for Water and Aquatic Environment (ONEMA). The UNESCO Strategic and High-level meeting on water security and co-operation (11^{th}-13^{th} September 2013) at Nairobi, Kenya provided additional support for pursuing this project. At the meeting several issues touching on science-policy interchange in the WaSH sector were discussed. The paper equally benefitted from several fieldwork activities and interactions with individuals and organizations in Nigeria and outside Nigeria. Finally, two public lectures I delivered at the University of Uyo 31^{st} May and 21^{st} June 2016 respectively on WaSH afforded immense opportunities to interact with diverse stakeholders in the academic, policy and civil society communities including non-governmental organizations through comments, discussions and questions and answer sessions. These opportunities opened an array of network of stakeholders which were taken advantage of through some follow-up discussions. The first water resources stakeholders' meeting of the Cross River Basin Development Authority (CRBDA) held on 3rd May 2005, at the Basin Authority Headquarters, Calabar, was also useful for building this paper. The review of secondary and grey literatures was equally helpful for understanding some theories, relevant discourses and information.

Several limitations are worth acknowledging. First, this project is exploratory, and intended to identify relevant issues for a larger project. Two, several interactions show most public officials are relatively poorly resourced to engage in discourses and provide adequate information to build up analysis on this topic. Most public officials preferred self-praises and commendation on their respective agencies on specific achievements than supply necessary information. Poor knowledge and poor documentation culture were probably responsible for inability to attract informed participation of public officials. Much of the discussions here will be based on data drawn from few agencies related to water and sanitation issues in Akwa Ibom and Cross River States, two of the 36 States in Nigeria. The following agencies were focused: the CRBDA, Akwa Ibom State Water Company Limited (AKWCL), Akwa Ibom State Rural Water and Sanitation Agency (AKRUWATSAN) and Akwa Ibom State Ministry of Environment. The University of Uyo was also used as a case to understand specific initiatives linked with knowledge interchange between the scientists and policy makers. Although such small sampling units are not generalizable across a large geopolitical Nigeria, findings are expected to open up research opportunities for larger projects.

Findings

Knowledge interchange in the WaSH sector

The performance of the WaSH management sector depends, to a large extent, on empirical knowledge of realities and practices fed into the policy circle from academic science and research. This works well through the interplay of the social processes and negotiations that take place between scientists, technologists and policy makers. These

are a form of 'boundary crossing' processes mediated by the complex dynamics of the state of human capacity development (practical and state of the arts knowledge, experiences, networking capabilities, work ethics, qualification, etc); and socio-cultural factors (existing societal norms and values, organizational culture, strength of the rule of law and due process standard, institutional autonomy, transparency and openness of the bureaucracy, political commitment to change, etc). These issues are controlled by the macro-and micro politics, administration and economics. Table 1 summarizes some characteristics, attitudes and practices of WaSH related public agencies in Nigeria, and further highlights implications of observed findings on science-policy interchange with specific reference to Akwa Ibom State, south-south region of Nigeria.

Table 1. WaSH related agencies and relationship with the scientists

WaSH-related public agencies	**Discussion topic**	**Official position**	**implication**	**Remarks**
Min of Environment	Public health protection laws/legislations	Reference was made to colonial (pre-1960) public health protection legislations	No progress in drafting new legislations or improving on old ones	A lack of evidence of collaboration to improve on those legislations as well as framing new ones to reflect present-day realities.
AKWCL/ AKRUWATSAN, Mins of Environment & Agriculture, etc	Culturally-induced WaSH practices	Great interest on the level of research on these with emphasis on collaboration with relevant scientists and knowledge communities	An indication that no such collaboration had ever happened and no clear policy or public programme to address these	Some officials equally narrated some practical experiences related to these issues in local communities but fail to fashion out policies and programmes to address them
AKRUWATSAN/AKWCL, etc	Guiding policies and programmes for WaSH in Akwa Ibom	Every discussions point to international norms and agenda	No indigenously rooted evidence-based WaSH related policies and programmes-evidence of none-collaboration with scientists.	Official perspectives based on top-down approach
All relevant public agencies	Human capacity challenge	Most discussions and explanations on specific issues from public officials reflect poor knowledge of realities	The impact of science in driving policies and programmes at public agencies is extremely poor.	Qualification and rank in individual public agencies hardly translate to practical knowledge of realities or improvement in practices/policies.
All relevant public agencies	Follow-up to discussions/activities	None of the public officials initiated contact and communication with me till date despite serious interest in the topic	The organizational culture patronizes 'business as usual' practices.	Poor interest in productivity, collaboration and improvement
All relevant	Channel of communicati	No clear, official and dedicated channel except	Closed bureaucratic system that is hardly	Macro problem of wicked politics and

public agencies	on and interaction with relevant scientists	through private network and informal relationship	open to knowledge and initiatives	corruption
All relevant public agencies	Participation at scientific forums	This seems to be done as a routine for reasons other than agency/policy improvement	Reflects a lack of interest in scientific knowledge and as evidence of none-use of evidenced-based science in framing public policies on WaSH.	One of the avenues to claim some monetary entitlements and as count for individual promotion/rank
All relevant public agencies	Research and development	Library, statistics and information units were occasionally mentioned	No budgetary commitment to research and development	Agencies exist to implement projects from the politicians and donor agencies. Libraries only house agency related publications and project reports
All relevant public agencies	Academic scientists serving in related agencies	Some academics on political appointments as Commissioners or transfer of service as heads or Directors of units.	Loyal agents dedicated to perfunctory duties of assisting existing government in power in project planning and execution. limited powers to initiate tasks on its own	Most academic appointees lack the capacity to drive changes in their respective agencies. Also opportunity to project self-power.

The discussion topics in Table 1 did not produce encouraging reports of shared commitments and practices among the critical actors. Public officers poorly understood the state of WaSH situations and practices in their domains reflected in interest on common facts, overwhelming support for common narratives and experiences, poor knowledge of organizational/roles, inability to account for progress and performance in the WaSH sector as well as a lack of awareness on socio-economic and developmental implications of WaSH related behaviours. Major indicators to these include inadequate legislative/legal tools for the WaSH management sector, low/absence of follow-up discussions on lead issues, non-existence/observance of infrastructures, basic platforms and routine practices for knowledge exchange including budgetary commitments, dedicated channels of communications, state of the arts library and research projects and a culture of participation in academic forums, among several others. Several public officials equally received with interest some empirical facts and narratives on the cultural aspects of WaSH practices with some additional narratives and shared experiences at their end. However, none had discussed or indicated existing organizational plans or mechanisms for collaborating with relevant scientists. A male discussant in one WaSH related agency argued thus: *'those in the Civil Service hardly understand what you are talking about…the Civil Service in our country is not interested in such things…we are only waiting for specific orders and money to execute projects…'* Agency capacity and autonomy to initiate and implement WaSH related policies and programmes are circumscribed by the highly centralized and regime-centred zero-sum politics and governance practices that depend on the political interests and economic incentives of actors and network in the system. WaSH policies and practices in such context do not depend on scientific evidence and knowledge; they are products of 'whose interest is

involved' and 'how much would accrue from initiating and implementing a given policy.' Till date, Nigeria's WaSH policies and practices are still built around historical legacies, prevailing international norms and routine practices as illustrated in Table 2.

Table 2 Available colonial and post-colonial regulatory instruments in the WaSH sector

Relevant Statutes	Main Provision
The Waterworks Act of 1915.	Specifically to keep water from being polluted by obnoxious or harmful matters.
The Minerals Act of 1917.	The law vests the Head of State of Nigeria with power to make regulations for the prevention of pollution of any watercourse.
The Public Health Act of 1917.	It prohibits the fouling of water and vitiation of the atmosphere by harmful human activities.
The oil in Navigable Waters Act, 1968.	It prohibits water pollution by oil spillage.
The Petroleum Act, 1969.	It covers prevention of pollution by inland waters, rivers, lakes and watercourses.
The Land use Act of 1978.	Ownership of Land linked to ownership of groundwater resources.
The River Basin Development (RBDA) decree/Act of 1976, 1987 & 2004.	To ensure a Pan-Nigerian programme for comprehensive and integrated water resources development.
The Environmental Impact Assessment (EIA) decree/Act 1992 & 2004.	The law seeks to protect the physical and aquatic environment.
Water Resources decree/Act of 1993 & 2004.	Nigeria's water resources now exclusively in the control of the Federal Government of Nigeria.
National Guidelines and standards for Environmental pollution control (1991).	Pollution control in watercourses as part of the environment.
National Effluent Limitation Regulation 1991.	Control of discharge of industrial waste and sewage into watercourses.
Pollution Abatement in Industries and Facilities Generating wastes Regulation 1991.	Control of industrial pollution.
Nigerian Industrial Standards for potable Water and Natural Mineral Water, 1992.	For public health protection.
Nigerian Standard for Drinking Water Quality, 2007.	For public health protection.

Source: Akpabio and Udofia (2016)

Few outdated colonial and postcolonial laws and policies still dominate the Nigeria's WaSH management sector. The waterworks Act of 1915 and the Public Health Act of 1917, among others are direct public health protection tools, while others such as the Environmental Impact Assessment (EIA) Act 1992 & 2004, Nigerian Industrial Standards for Potable Water and Natural Mineral Water, 1992, had some indirect impact on WaSH management. Available WaSH policies in Nigeria have no dynamic and comprehensive plans for addressing every facet of WaSH challenges. Few relatively direct public policies including the National Rural Water Supply and Sanitation Policy 2000, the National Water and Sanitation Policy, 2004, and the National Environmental Sanitation Policy (NESP 2005), focus mainly on achieving improved coverage over some period of years. While the neoliberal and other international framework agreements broadly guide local WaSH administrative and management agencies, local practices may differ from one State to another. Akwa Ibom State, for instance, has no WaSH policies.

Relevant public agencies including the Akwa Ibom State Water Company Limited (AKWCL), Akwa Ibom State Water and Sanitation Agency (AKRUWATSAN), the Akwa Ibom State Ministry of Environment, depend on the federal framework with no local initiatives.

While drinking water supplies dominate Nigeria's WaSH policies and practices, sanitation is emphasized on paper but tangentially translated into practical outcomes. Hygiene, on the other hand, is rarely explicitly mentioned in any WaSH policy agenda. Poor knowledge of the epidemiological link between water, sanitation and hygiene by relevant public officials probably account for such differential priorities/disjointed practices. Knowledge of such relationship would better be achieved through scientific information, but public officials hardly work with scientists to evolve contextually relevant policies. One fundamental basis for such disconnect is linked to poor human capacity to take advantage of scientific knowledge. A typical case came up during a discussion session on the 21st June when two public officials presented contradictory facts on the drinking water quality provided by private commercial interests. While one argued in favour of the presence of worms, weeds and other unwanted material in an overhead drinking water tank that had not been cleaned for over two years, the other official countered what he called ignorance of reality and explained the fact.

The scientific community is traditionally associated with some established practices and platforms that could enhance appropriate knowledge transfer to the policy space. Seminar and Conference forums, policy briefs, joint research and consultancies, staff exchanges and training, and the involvement of academics in political and bureaucratic affairs, among others are practical traditional channels. In Nigeria, academic and research institutions and government bureaucracy tends to exist as separate entities, with no functional and regular interactive mechanisms. Public officials and policy makers consciously avail themselves of some of the academic and scientific platforms for purposes related to self-promotion and rank at job places than improvement in capacity to deliver improved policy outcomes in the WaSH sector. A male academic gave an interesting narrative of official disinterest in local scientific facts as follows:

> ***'I was invited sometimes in 2008 for a lead presentation on the public health aspect of sanitary practices organized by a certain socio-cultural group then…I discovered every attention was fixed at politicians who came in to deliver speeches one after the other…No one even bothered to realize I was to open the discussion as an academic and expert in the field…Suddenly those I considered as policy makers and politicians who I had thought would be interested in the presentation left one after the other. I pointed this anomaly out to one of the organizers who pleaded with me to wait and have longer hours after the key officials would have gone. I queried such anomaly pointing out to him the importance of my paper to the policy community, but no one seemed to understand the sense…'***

The Nigerian bureaucratic and political systems sustain an unproductive culture, where ethnic and patronage politics and corruption thrive to the detriment of competence, initiatives and service interest. Civil servants, politicians and policy makers exist to further self and group interests for economic and political reasons. Employment opportunities in public agencies, for instance, are channels to achieve ethnic patronage, cronyism as well as hand out rewards for political loyalists. '*…our agas [a popular slang for a top officer] are interested in what comes in…in terms of money and higher position...'* argued a female senior staff who claimed to work in one of the WaSH related agencies. Within such context, every WaSH related public policy and projects rarely reflect the interest of public service, but designed to achieve narrow and selfish predetermined agenda of financial enrichment and political patronage. A similar culture pervades the scientific community which stifles the incentives for meaningful academic and scientific progress. Students and staff research reports are hardly utilized for policy purposes; they serve for the fulfilment of the requirement for graduation and subsequently circulate within the academic environment. Good research projects become readily available for staff use and publication for promotion and rank, raising a number of ethical queries (Akpabio and Esikot 2014).

The responsibility for translating complex science into useable policy decisions rests on the academic, research and scientific communities. Useful tools such as policy briefs/forums, Press briefing and media publications, consultancies, and several other forms of internal translations and discussions or public and policy engagements, serve as important avenues. So far, no internal platforms exist in WaSH related agencies for fulfilling the task of translating scientific knowledge into useable policy ideas. This is probably due to a lack of dedicated research unit and staff capacity to engage in complex science discourses and translations for the benefit of their respective agencies. At the scientific community perspective, no evidence of dedicated policy briefs. However, occasional media publications, consultancy and other services touching on WaSH related policy matters hardly reflect in any public policy thrust. In 2016, the Research Committee of the Faculty of Social Sciences, University of Uyo, was considering the possibility of setting up a political contact platform and group to liaise with government and politicians to attract research and consultancy opportunities for staff in the faculty. Though a noble idea, it is doubtful if this initiative would have meaningful impact in influencing the utilization of scientific information and research outputs for policy purposes. It is however a necessary step toward enhancing the future of science-policy communication.

Science-policy relationship in the Cross River Basin Development Authority

As one of Nigeria's River Basin Development Authorities (RBDAs), the CRBDA was empowered by Decree No.35 of 1987 with a broad mandate to manage water and related resources in the basin catchment comprising the present Akwa Ibom and Cross River States, south-south Nigeria (latitudes 4°00′N and 6°50′N and longitudes 7°40′E and 9°40′E). The legal backing provided the framework to manage the water resources of the basin, on behalf of the Federal Ministry of Water Resources (FMWR) to address several water use and management needs, including flood and erosion control and the provision of infrastructure to farmers without direct involvement in food production.

How does the CRBDA engage with the scientific community and other diverse stakeholders in framing and implementing policies and programmes of the agency? The CRBDA decentralizes its operation on project basis giving rise to different departments

or units respectively designated for Administration and Finance; Construction, Operation and Maintenance; Planning, Investigation and Design. There are several extension units which include: Obubra/Owakande Irrigation project; Itu Irrigation/drainage project; Obudu Earth Dam /Irrigation project; Ogoja Irrigation project; Ijegu Yala Multipurpose Dam /Irrigation project; Calabar River Irrigation Project; Akwa Ibom Area Office; Abak Irrigation project; Oniong Nung Ndem Irrigation project; Liaison office, Abuja; Commercial Services; Nkari Dam project; Ikot Nkim water project and Akpap Okoyong water project. The CRBDA is expected to work, and liase with communities in its catchments areas in identifying projects for funding and development. But what interface exists to relate with the scientific community? Table 3 gives some ideas:

Table 3: Mechanism for knowledge interchange between the CRBDA and scientists

Collaboration interface	**forms**	**Remarks**
Stakeholder forums	-Rarely used. The first general stakeholder meeting took place on the 3rd May 2005 -EIA occasionally used in bigger projects	Where stakeholder forums exist, they are usually conducted as a routine with no force or impact on the management of the basin
Conference participation	Useful mostly to enhance the rank and chances of promotion for individual staff	-New scientific ideas are rarely integrated in the basin's policy initiatives -Conference attendance mostly motivated by prospect of financial claims by staff members
Joint/collaborative research	Weak and extremely rare	-Directors of Research Institutes are statutorily members of the CRBDA Advisory Committee -the CRBDA has no functional Research Departments
Utilization/engagement of scientists in the basin activities	Scientists are rarely used	The CRBDA depends on Consultants and Contractors for project development and implementation
Journal subscription	None	The CBDA's library is filled with old books touching on the basin's history, characteristics and development
Staff capacity for professional engagement	Over 90% of staff is administrative	Few professional staff rarely sustains regular communication and membership with cognate science and professional bodies
Research and Development	No functional research unit/department	Planning, investigation and design unit are appropriate units for statistics while information and library section supply Basin related facts.

The CRBDA does not maintain strong and collaborative relationship with Universities and relevant research institutions as much as it does with private contractors and consultants. Government policy of utilizing outside contractors and consultants for project development and implementation creates room for political interest and effectively undermine the involvement of scientists in the activities of the basin authority.

The CRBDA has no human capacity basis for collaborating with scientists in its policy formulation and project development/management. Its manpower strength is over 80% of the low-level cadre, dominated by drivers, security guards, messengers, typists and head watchmen. About 55.45% of its staff is found at the administrative headquarters, while 44.55% is distributed to 14 project units.

Critical functional areas and specialties including Forestry experts, Hydrologists, Ecologists, Remote Sensing, GIS and Computer experts do not have record of qualified staff. These functions were deliberately brought in since they are critical to the success of IWRM. The importance of technical manpower for IWRM has been variously recognized in the literature (Mitchell, 1990 and Saleth, 2004). The CRBDA Staff Nominal Roll shows few secretarial staff with Certificates in computer studies. However, training leading to such certificates is organized to build-in computer awareness in few Secretarial Staff as a prelude to replacing the manual typing arrangements.

IWRM implies the amalgamation of all use sectors, all stakeholders, all prefectures, all tiers and all institutional constituents, both formal and informal, to make a viable and sustainable management system (Sokile etal, 2005). The decree setting up the CRBDA recognizes this in its various sub sections. Section 2-(1) recognizes the inclusion of representatives from Ministries of Agriculture, Water Resources and Rural Development in the Authority's Management Board. Similarly, section 7-(1) mandates the CRBDA to set up Advisory Committee with members drawn from the Department of Water Resources; different divisions in the Ministry of Agriculture and Natural Resources; the Directors of relevant research Institutes; General Managers of the State Water Boards or Corporations; and the District Manager of the National Electric Power Authority. The two sections in the decree set the pace for integrated and collaborative water resources management actions, though other vital Ministries and Departments such as Environment as well as related State Ministries are left out. At the first water resources stakeholders' meeting of the CRBDA held on 3rd May 2005, the Basin Authority invited the following recognized stakeholders:

a. Ministry of Public Utilities
b. Ministry of Rural Development
c. Cross River Water Board Ltd
d. Cross River Rural Water supply and sanitation Agency.
e. Akwa Ibom State Water Company Ltd
f. Akwa Ibom State Rural Water supply and sanitation Agency
g. CRBDA Staff (from Grade level 14 and above)
h. Nigerian Ports Authority
i. Chairmen of LGAs
j. Agricultural Development projects
k. Universities
l. Consultants
m. State Primary Education Board

Obviously not invited to the meeting were the Ministries of Environment at States and Federal Levels; Water Users Associations and Irrigation farmers; project communities and junior staff of the Basin Authority. Throughout the discussions at the meeting, it was clear there were no inter-agency, departmental or organizational collaborations. Table 4

summarizes the nature of collaboration existing between the Basin Authority and related organizations, departments and institutions.

Table 4 Nature of Collaboration between the CRBDA and other Organizations and Institutions

Organizations/Institutions	Nature of collaboration	Strength of collaboration
State water companies/Boards	The GMs of States Water Boards are statutorily members of the CRBDA Advisory Committee.	Very weak
LGAs	None	None
Universities/Research Institutes	Directors of Research Institutes are statutorily members of the CRBDA Advisory Committee	Very weak
Project villages/communities	Joint management of projects in some cases as well as occasional security to projects.	Very weak in most cases
State Ministries of Agriculture, Rural Developments, and Environments	None	None
Federal Ministry of Agriculture	Heads of different Departments are statutorily members of the CRBDA advisory Committee.	Very weak
Federal Ministry of Environment	None	None
Federal Ministry of Water Resources	The Zonal officer of the FMWR is statutorily a member of the CRBDA advisory Committee	Very weak
Private individuals and Organizations	Consultancy, equipment lending and borrowing and contract Award/Execution	Very strong
Foreign Technical Partners	None	None
Funding Agencies	For Assistance	Very weak
WUAs and related Organizations	Project management as in irrigation	Very weakly developed

The CRBDA, the two state governments and the 48 local government authorities in the basin area operates parallel projects, programmes and Agenda with no coordination. Consequently, collaboration between the various states and local government agencies is very weak, in most cases ends at retaining statutory membership in the CRBDA management Board (table 4).

Discussion and concluding remarks

The performance of the WaSH sector in Nigeria is generally less than optimal. Discussions and analyses demonstrate that the sector is still yet to benefit from the inputs of scientific knowledge especially in policy and administration. Poor functional connection between scientists and policy makers reflect in several spheres of interest including poor commitment to research and development, absence of practical and progressive public policies and laws, poor adaptation and utilization of state of the arts ideas, poor culture of communication and information exchange, among several others. Poor science-policy collaboration in Nigeria's WaSH sector appropriately depends on

some micro and macro-level perspectives related to individual capacity, political commitment, institutional effectiveness and socio-cultural factors.

WaSH related agencies serve to perform perfunctory duties and services in forms of implementing government projects, enforcing appropriate service standard, managing donor funds and resources and performing other relevant tasks as may be assigned by the government of the day. Nigeria's complex ethnic background affects the State's bureaucracy and the functioning of its institutions. Agencies are used as platforms for pursuing ethnic agenda of recruiting and rewarding individuals and staff, which pursue rank and promotion as well as furthering specific ethnic and political interest at the expense of productivity and performance. Akpabio (2007) noted the Cross River Basin Development Authority (CRBDA), for instance, sustains over 80% of the low-level cadre, dominated by drivers, security guards, messengers, typists and head watchmen. Similar situations apply to various other agencies. While agencies serve some purposes of tending to ethnic and political interests, the general work ethics of staff is shaped by economic interest, which comes through approvals and distribution of essential WaSH infrastructures or during project implementation and monitoring. Institutional transparency and accountability are rarely enforced. Also, the absence of experts and qualified personnel in WaSH related agencies poses a barrier to communication with relevant scientists as well as understanding, translating and taking advantage of complex scientific knowledge in framing practical and context-driven policies in the sector.

The larger question of political sources and commitment to change and practical reforms is captured in the poor and weak legal and policy incentives for encouraging science-policy interchange. Government seems to prioritize the services of private consultants over that of appropriate scientists in initiating and implementing policies. This has already been discussed as sources and channels for diverting public funds into private purse. The primary legal foundation governing the WaSH sector rests on few colonial laws with very limited provision that was meant to serve the public health interest of the colonial masters. No significant progress has been recorded at post-colonial period in terms of the number and quality of WaSH related laws and policies. The basis for knowledge interchange and communication with the scientific community should naturally be driven by practical commitments of the State through its various policies, laws and administrative practices. Poor and weak State's interest in setting direction, standards, enforcements and infrastructures in the sector means WaSH related agencies are left to pursue disparate agenda to be able to justify existence and funding. Real progress is undermined by inter-agency competition, ethnic politics and business-as-usual ethos.

In conclusion, Nigeria's WaSH sector is not driven by knowledge anchored on research and development. This is related to the macro-and micro-level political processes and economic interests of States. Nigeria's bureaucratic structure is one major obstacle. Public officials and policy makers in the WaSH sub-sector exist to conduct routine administrative activities, implement key decision from the top management cadre and earn their rank before final retirement. This paper argues that the State should carry the necessary incentives for encouraging science-policy collaboration in the sector through specific policies and standard practices. The State's capacity to drive change in the sector through science-policy cooperation could be shaped by institutional effectiveness and citizens' interest. Given poor representation of WaSH issues in political

campaigns and debates, in addition to the challenges of weak manpower resources, the natural framework for securing institutional effectiveness in the sector is already absent. WaSH related policy and legislative initiatives and functioning are sustained by institutional effectiveness, which should flourish on the basis of scientific knowledge and facts. The relative insight from the political economy angle enhances the argument that the WaSH sector in Nigeria has not benefitted from scientific knowledge. It operates on a stand-alone basis. The weaknesses in the wider polity in terms of regulation, work ethics, absence of productivity, a lack of capacity to understand the problem and monitor performance, corruption in appointment of management staff, poor staff capacity to manage a resource system, among others, affect the prospects of building sound science-policy collaboration culture.

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