Journal of Community Positive Practices, XVI(2) **2016**, *70-85*
ISSN Print: 1582-8344; Electronic: 2247-6571

REPOSITIONING RENEWABLE ENERGY FOR RURAL ELECTRIFICATION IN A FOSSIL FUEL-RICH ECONOMY

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***Abstract**: How has being a fossil fuel-rich country affected the large scale adoption of renewable energy and its associate technologies for rural electrification and development projects in Nigeria? This is one of the most prevalent questions of significant interest to energy experts and observers in Nigeria. Discerning the factors at play it is believed, could help soothe the troubling energy dichotomy of having an abundance of energy sources and being one of the least served with electricity in the world. This qualitative phenomenological study explored across a spectrum of selected energy bureaucrats within some federal government agencies, the seemingly lack of interest in the utilization of the abundant renewable energy sources for rural electrification projects in Nigeria and the influence if any, fossil fuel has had on the use of these energy sources for rural electrification. Following a qualitative research methodology, data on specific issues affecting the uptake of renewable energy technologies in rural electrification in Nigeria was collected through document analysis and semi-structured interviews. It was found that for renewable energy to be entrenched in the rural electrification sector in Nigeria, it needed a high level of legitimacy. As found by the study, this required conscious government participation, increased awareness, serious advocacy, improved bureaucratic involvement, and efforts to overcome liabilities of newness of the concept of renewable energy powered rural electrification.*

***Keywords**: Legitimacy; Renewable energy; Rural electrification.*

1. Introduction

Very few countries can boast of an abundant supply of both renewable and non-renewable energy sources. Nigeria is one of such countries – a nation "endowed with abundant energy resources, both conventional and renewable, which provide her with immense capacity to develop an effective national energy plan" (Akinbami, 2001, p. 155). However, owing to prevalent flaws in the electricity sector and poor exploration of available renewable energy sources (GEF, 2013; Ohiare, 2015) the overall level of

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electrification and "household access to electricity services in Nigeria is low" (Oyedepo, 2014, p. 261). The abundant renewable energy sources in Nigeria, "have not played a major role in its developmental efforts so far" (Efurumibe, Asiegbu, and Onuu, 2014, p. 74). Compared to other Sub-Saharan African countries with similar topography, for example Kenya; with one of the most active renewable energy sectors in Africa (ABB Group Media Relations, 2015) the level of uptake of renewable energy sources for electrification especially in the rural areas is more or less at its barest.

Renewable energy has been touted "as one of the strong contenders to improve the plight of two billion people, mostly in rural areas, without access to modern forms of energy" (World Bank, 1999 cited in Painuly, 2001, p. 73). As a source of energy, it comes in different forms, with each form having its own unique costs and benefits depending on the type of technology adopted. The consensus is that renewable energy produces no emissions, is clean, affordable, domestic, and effectively infinite. Harnessing renewable power inherently creates jobs and generates revenue for local communities (Organisation for Economic Co-operation and Development, 2012). Renewable energy sources "in contrast to fossil fuels, are environmentally friendly, ubiquitous, self-replenishing, infinite, and consequently considered world-wide as the way of the future" (Sesan, 2008, p. 2). However the reality is that, in most developing parts of the world, for example Nigeria, where renewable energy has been promoted as a likely solution to rural electrification and development problems (Okafor and Joe-Uzuegbu, 2010), there still exist a considerable amount of issues militating against its use for developmental energy and electricity projects.

Different reasons responsible for the dearth of renewable energy in rural electrification in Nigeria have been advanced in various studies. Some of these studies (e.g. Akinbami, 2001; Efurumibe et al., 2014; Karekezi and Kithyoma, 2003) argued that the issues with the development or large scale adoption of renewable energy sources for electrification in Nigeria were as a result of the country being a very large fossil fuel economy which basically implies little or no attention to renewable energy sources; others (for instance Mohammed, Mustafa, Bashir, and Mokhtar, 2013; Oyedepo, 2012) acknowledged that the generic barriers to renewable energy have essentially contributed to the challenges faced by Nigeria in its renewable energy deployment for rural electrification in particular and electricity provision in general. Likewise, policy implementation was emphasized by Ajayi and Ajayi (2013) and Brew-Hammond, Mensah, and Amponsah (2014) as one of the main issues facing the widespread adoption of renewable energy for rural electrification in Nigeria. While according to Chineke and Ezike (2010) and Eleri, Ugwu, and Onuvae (2012), it had more to do with political will and government support. All these concerns are not mutually exclusive as a proper orchestration of them all is required for renewable energy powered rural electrification to make any meaningful headway in Nigeria.

Going by the above assertions and considering the favorable characteristics of renewable energy, it has been argued that renewable energy powered decentralized systems should be the approach to rural electrification and sustainable rural development in Nigeria (Ajayi and Ajayi, 2013, p. 62; Oyedepo, 2014, p. 263). However, several structural and systemic constraints in the electricity supply industry in Nigeria have impeded the success rate of the government's interest in rural electrification in

general (Eleri, 2002). Considering the nation's potential energy sources and her estimated reserves (see *Table 1* (based on 2005 data)), it can be argued that ideally energy crisis shouldn't be an issue in Nigeria but unfortunately, the reality is that most "of these resources are yet to be explored while" the maximum utilization of the few that have been tapped has been inadequate (Ohunakin, Ojolo, and Ajayi, 2011, p. 2007). Nigeria's energy reality is that the potentials of renewable energy not withstanding, "regrettably, renewable energy resources are presently disregarded from the energy supply mix" (Shaaban and Petinrin, 2014, p. 79). The country as alluded by Okoro (1999) is one solely dependent on non-renewable fossil sources of power for electricity.

Table 1: Nigeria Renewable and Non-Renewable Energy Reserve and Capacity (2005)

Source of energy	Estimated reserve
Crude oil	36.5 billion barrels
Natural gas	187.44 trillion cubic feet
Tar sands	30 billion barrels of oil equivalent
Coal and lignite	Over 40 billion tonnes
Large hydropower	11,235 MW
Small hydropower	3,500 MW
Fuel wood	13,071,464 ha
Crop residues	83 million tonnes/year
Animal wastes	61 million tonnes/year
Solar radiation	3.5–7.5 kW h/m2/day
Wind	2–4 m/s @ 10 m height

Source: *Draft National Energy Master Plan, Energy Commission of Nigeria, June 2007 (Oseni, 2012, p. 3968).*

That the nation depends on fossil fuels for its energy needs, however doesn't mean there has not been efforts to implement renewable energy projects. Taking into account the amount of resources that have been expended in rural electrification and renewable energy development programmes in Nigeria and considering the plans as documented in the Renewable Energy Master Plan (REMP) as well as the National Energy Policy (see Energy Commission of Nigeria, 2005a, 2012), it could be said that the issues facing the use of renewable energy sources especially in powering rural electrification projects are more of a reflection of the difficulty of translating priorities established at the policy level into practice down the bureaucracy. The existence of these renewable energy-friendly mechanisms as it seems, have not transformed into any tangible programmes or schemes. This paper emanates from a study that sought to explore this phenomenon of a seemingly lack of interest in renewable energy sources for rural electrification projects in Nigeria despite the abundance of these resources.

2. Methodology

This paper tries to address the first research question of the PhD dissertation: "*Issues affecting the uptake of renewable energy sources for rural electrification and development projects in Nigeria.*"

It seeks to provide an insight to the question of how the availability of fossil-fuel in the country has affected the large scale adoption of renewable energy for rural electrification and development, by highlighting those factors deemed to influence the choice and diffusion of renewable energy technologies for rural electrification in Nigeria. An iterative and inductive process following a phenomenological approach from an interpretivist theoretical perspective (Bloomberg and Volpe, 2012; Creswell, 2012) was adopted in the research design. Data was collected over a three month period from semi-structured interviews with 17 purposively sampled senior energy bureaucrats in some of the agencies tasked with energy and electric power development in Nigeria. Following Glesne (1999), analysis was carried out in most part simultaneously with data collection and document review to help focus and shape the study as it came along.

Significant statements, generation of meaning units, and the development of an 'essence' description were applied (Moustakas, 1994). Focus was on attitude and response to the phenomenon under study, with the aim of achieving an analytic description of the phenomenon devoid of prior assumptions (Bloomberg and Volpe, 2012). In typical qualitative methodological sense, the transcripts and field notes were read, analyzed and reviewed line by line. Analysis was carried out manually and using the highlighting tool in Microsoft Word, codes were highlighted and reflective remarks added as comments where necessary. This iterative process mirrored that used by Graham (1997). It entailed the systematical coding of data into as many themes and meaning categories as possible through first level coding which served the purpose of summarizing segments of data as suggested by Strauss and Corbin (1990). Limiting the data collection to a selection of senior executives in the bureaucracy, ensured that the study focused on those participants deemed to be best suited for the job of making meaningful changes in the renewable energy powered rural electrification arena. This is because their concerns and perspectives were what was expected to form the basis of the findings and subsequent recommendations.

3. Findings

The findings from the study that addressed the issue of how the availability of fossil-fuel in the country has affected the large scale adoption of renewable energy for rural electrification and development emerged as the themes classified under the category: Factors for entrenching renewable energy for rural electrification. An overwhelming majority of the participants provided responses associated with the themes in this category. The responses indicated that these factors were crucial to the process of legitimizing and institutionalizing renewable energy as a viable option for rural electrification projects in a fossil fuel rich economy like Nigeria. The factors that emerged include serious advocacy, efforts to overcome liabilities of newness, improved bureaucratic involvement, conscious government participation and increased awareness. This finding is noteworthy in terms of the large number of responses from the participants associated with it, and how relevant the issues in this categories are to achieving a renewable energy powered rural electrification programme in Nigeria. A compiled summary of the emerged factors for entrenching renewable energy for rural electrification in Nigeria is presented in *Table 2*.

3.1. Conscious Government Participation

A vast majority of the participants (15 of 17) accentuated the notion that a conscious participation from the government was required for renewable energy to gain a strong footing in rural electrification in Nigeria. The prevailing culture of Nigerians encourages this – an element of expectation that getting things done was the sole responsibility of the government. As remarked by one of the participants: *"even if you are going to do renewable energy powered rural electrification, government has to shoulder the bills because that is the belief of the Nigerian people"* [NERC2]. This view of having government involvement in ensuring the successful uptake and sustainability of a renewable energy powered rural electrification programme in Nigeria was also conveyed by some other participants, as seen in the following statements:

> *I think the motivation for the use of renewable energy will come from the Government. Especially in pilot projects, understand? … that one will motivate investors to also go, seeing the one that has been implemented by the Government.* [MOP7]

> *If the president decides today that we are going on renewable, there is nobody who will stop it … The government machinery will be set in place to make renewable work in Nigeria. So it's more of the government will.* [MOP2]

Table 2: Factors for Entrenching Renewable Energy for Rural Electrification

Participants' Interview Markers: *First three-four letters represents the agency acronym while the number represents the participant interviewed. For instance, ECN1 indicates participant 1 from Energy Commission of Nigeria (ECN).*

Respondent	Marker	Advocacy	Overcome Liability of Newness	Improved Bureaucratic Involvement	Conscious Government Participation	Increased Awareness
1	ECN1	✓		✓	✓	✓
2	ECN2	✓		✓	✓	✓
3	ECN3	✓		✓	✓	✓
4	MOP1			✓	✓	✓
5	MOP2	✓		✓	✓	✓
6	MOP3	✓		✓	✓	✓
7	MOP4	✓	✓			✓
8	MOP5			✓	✓	✓
9	MOP6	✓	✓	✓	✓	✓
10	MOP7	✓	✓		✓	✓
11	NERC1	✓		✓	✓	✓
12	NERC2	✓		✓	✓	✓
13	REA1	✓	✓		✓	✓
14	REA2	✓	✓	✓	✓	✓
15	REC1				✓	
16	REC2			✓	✓	✓
17	REC3					
Total	17	71%	29%	71%	88%	82%

Source: Data based responses from research interview

Government involvement was also viewed from the perspective of cushioning the effect of the high cost of implementing renewable energy projects [MOP1] and financing of such projects [REC1 and NERC2]. As gleaned from such comments like: *"the Government should take the lead. That is what I am saying"* [MOP7], and "*a serious government, okay, on seat, will do it and it will move faster"* [REC2], government participation for the propagation of renewable energy powered rural electrification in Nigeria from the perspective of some of the participants was more of a getting-it-done-because-the-government-wants-it-done.

3.2. Create Better Awareness

Creating better awareness of the idea of having renewable energy powered rural electrification schemes in Nigeria also made up a vast majority of the responses from the participants. Better awareness both at the government/bureaucratic level and at the rural community/recipients level was emphasized by 14 of the participants as one of the key means through which the application of renewable energy and its associate technologies could be ingrained in the Nigerian energy and electricity arena. Most of the responses showed that though there already exist some elements of awareness and enlightenment as regards the viability of renewable energy for power generation in Nigeria, a lot more had to be done in light of the issues facing renewable energy. The importance of creating increased awareness was echoed by ECN1 who saw awareness as a means of showcasing the feasibility of renewable energy projects when he surmised in his response that: *"the execution of pilot projects for people to see; demonstration projects that these things are working, that is it."*

Other comments by some of the participants highlighting the emphasis placed on increasing awareness include those by REA1 who stated: "… *To create awareness, we have also done some feasibility studies and we have done some pilot projects and also like I just, I told you earlier, we have done some solar street lights,"* and that by MOP6 who highlighted that: "… *to guide the Government in ensuring effective policy to encourage the use of renewable energy which is what we are doing ... by the time the policy becomes more effective, and awareness is created we will be able to see the advantages of renewable energy."* Better awareness was also presented as a tool to help streamline the numerous and conflicting information about renewable energy that has somewhat stifled its acceptance among Nigerian energy bureaucrats. According to MOP2, *"Nigeria has heard so much that at times to take a decision becomes difficult … so better awareness will help reduce this over flux of information."* The argument for the creation of better awareness on how the use of the abundant renewable energy sources could be expanded for power generation was extended by REA2 along the lines of a re-orientation of the Nigerian education curriculum. He stated that *"the curriculum in the universities in Nigeria should take renewable energy option serious, for our own graduates to begin to understand that it's not only grid system alone that should be considered in electricity generation."*

3.3. Advocacy

Closely linked to issues relating to increase of awareness are activities that had to do with advocacy. Most of the responses from 12 of the participants indicated that for renewable energy to play any significant role in rural electrification in a fossil fuel rich

country like Nigeria, it will have to be supported by a very strong coalition of advocates especially among the stakeholders. Advocacy was deemed to be required among the stakeholders as a means of promoting renewable energy and reducing the challenges of promoting it. Such statements like: "*There has to be strong advocacy for these renewable energy powered electricity projects, for them to gain ground … and there has to be total buy-in by the communities"* by REC2; and those by REC3 who indicated that "f*or renewable energy electricity to gain ground in the communities, the beneficiaries have to clamor for it through their political representatives that this is a good way to provide us with electricity,* highlighted this.

MOP2 saw the possibility of advocacy only if there was a champion for the course. According to him, a huge challenge faced by renewable energy is not having someone who can act as a voice, strong enough to break the perception of policy makers towards the use of renewable energy for rural electrification. According to him, *"if somebody can get these key people to agree, you understand? Or to adapt the renewable energy thing, the country will start singing that song immediately."* He buttressed his point citing a recent occurrence: "*When we started the energy efficiency, how did they get government's attention? It was basically because through ECOWAS, we were able to get some of the key people to go to Cuba to see how these bulbs worked and how they had implemented it"* [MOP2].

3.4. Improved Bureaucratic Involvement

12 of the participants indicated that improved bureaucratic involvement in the renewable energy development and rural electrification process will go a long way to ensure that renewable energy finds its place in rural electrification projects in Nigeria. Some of the concerns raised, reflected the shortcomings in the activities of the bureaucrats in the various agencies related to renewable energy development and rural electrification. MOP2 astutely pointed out why it could be said that involvement by the bureaucrats was subdued or very passive. To him, no matter how much the bureaucrats would want to be involved, their effort will always be constrained by the final say from the people in power. A major area of involvement by the bureaucrats as indicated by NERC1 was in the aspect of ensuring standards and regulations. According to him, the bureaucrats are meant to ensure that "*standards … are what they are supposed to be. If there's no regulatory body then there will be so much fake products.*

Responses from other participants indicated that each agency was invested in different degrees in seeing to the widespread use of renewable energy for rural electrification in Nigeria – the question being to what degree? Most of the participants (for instance ECN2 and NERC1) felt that their agencies were already well involved in the successful adoption of renewable energy. Acknowledging that being fully involved in the process of promoting the use of renewable energy technologies was important for its propagation in Nigeria, ECN2 highlighted the accomplishments of his agency, stating that: "*We were also able to set up Jathropha farmers association for production of biodiesel … the World Bank gave us assistance in the development of biodiesel using Jathropha Caucus. So these are some of the things we have been able to do*." Though most of the participants were able to establish the involvement of their agencies in seeing to the successful propagation of renewable energy programmes, it was obvious that their commitment to these programmes were not very strong. This could be attributed to the length of the

bureaucratic chain which could well dampen the momentum behind efforts geared towards the implementation of renewable energy projects as can be inferred from the response by ECN1 when he presented the Renewable Energy Masterplan document to the researcher:

> *This document that I have given to you is what ECN has done. All the resources are there, the opportunities are there, the timelines are there, the targets are there … We are now asking them to take it to the Federal Executive Council. So that they will look at it, approve it and send to the national assembly. So the Commission has done all that they need up to date.* [ECN1]

The need to improve the commitment of the agencies to a renewable energy programme was not lost on the participants. They were quick to emphasize the importance of building on what has been achieved so far – human capacity development [ECN3], creating and maintaining a better framework [MOP1] as well as facilitation and mediation [MOP3].

3.5. Overcome Liability of Newness

Only a few of the participants provided responses that had to do with the issue of overcoming the liabilities of newness as a means of institutionalizing the use of renewable energy for rural electrification in the Nigeria. Their view was that due to its novelty, very few people within the decision making arena were actually aware of the practicality of renewable energy technologies in rural electrification. As such many don't see renewable energy technologies as sustainable means of electric power generation. REA2 underscored this stating: "*Now this is another option that is very new and strange to most of the technical people in this country, and the policy makers ... renewable energy is new and our attitude to imbibing new technologies is usually slow."* Although mostly portrayed as a liability, the issue of novelty of renewable energy technologies in Nigeria was however seen by some of the participants as an advantage to its development [REA1]. To them, having a fresh canvass provides a means of trying out the concept without the hindrance of legacy infrastructures [MOP7].

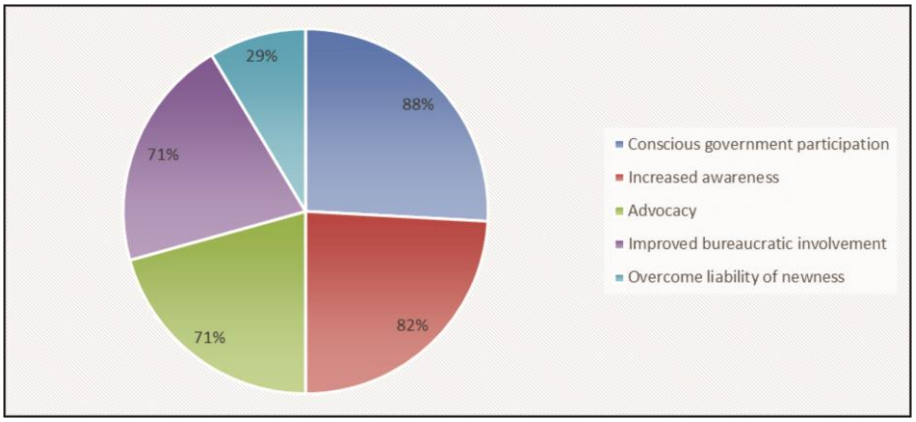
4. Discussion

The literature on the acceptance of a new or alternate form of energy like renewable energy (see Bergek, Jacobsson, Carlsson, Lindmark, and Rickne, 2008; Jacobsson and Bergek, 2004; Jacobsson and Lauber, 2006; Negro, Hekkert, and Smits, 2008) indicates that entrenching and hence repositioning renewable energy for rural electrification in a fossil fuel rich economy, required a certain level of legitimacy. This was needed to help overcome institutional barriers that could pose as obstacles both in the near term and in the long run. An overwhelming majority of the participants were of the stance that for renewable energy to be accepted, legitimacy will depend on the concept of a renewable energy powered rural electrification programme in Nigeria overcoming several misconceptions while building on already proven strengths of the concept.

Legitimizing and institutionalizing a renewable energy powered rural electrification programme in a country like Nigeria with a seemingly more accessible and dominant

alternative, entailed several factors. Among these factors are: the involvement of the administrators and policy makers, ability to make renewable energy more attractive, advocacy, awareness, and a conscious participation of actors (e.g. government, stakeholders etc.) (Akpan, Isihak, and Udoakah, 2013; Bergek, Hekkert, and Jacobsson, 2008; Bergek, Jacobsson, and Sandén, 2008). Responses from the participants tallied with the above factors from prior studies. Just like the literature suggested, the responses from the participants showed that legitimizing renewable energy as a viable option for rural electrification projects in a fossil fuel rich economy like Nigeria required conscious government participation, increased awareness, serious advocacy, improved bureaucratic involvement, and efforts to overcome liabilities of newness. *Figure 7* shows the distribution of the responses from which the themes in this category were obtained.

***Figure 7**: Factors for Entrenching Renewable Energy for Rural Electrification in Nigeria*



Source: Author's Conceptualization from Research Interview Data

4.1. Analysis of the Emergent Themes

The literature on legitimacy and institutionalization as suggested by Bergek, Jacobsson, and Sandén (2008) established the need for conscious participation from the government, as this is required for the fulfillment of such government responsibilities as regulative alignment, market regulations, tax policies and the direction of science and technology policy. With government participation, it is easier to establish renewable energy powered programmes, as government can easily exercise their powers by creating enabling institutions with mandates to promote the programmes (Agboola, 2011; Bugaje, 2006). This notion is consistent with the perception of almost all of the participants, who saw the onus of building the foundation for a viable renewable energy powered rural electrification programme in Nigeria as primarily that of the government. As one

participant puts it, for you to actually do renewable energy powered rural electrification, *"… government has to shoulder the bill"* [NERC2]. The participants' perception of how crucial government involvement was, also reinforced the proposition by Akinbami (2001, p. 178) that "the development, application and diffusion of renewable energy systems especially for decentralized electricity generation and supply into the Nigerian economy require adequate institutional support and strengthening." A conscious government participation as the finding showed, consolidated the participants' expectation of a success highly dependent on the Nigerian government being fully involved or invested in the idea of actually using renewable energy for rural electrification.

With regards to *the creation of better awareness,* the analysis showed that the participants all saw the awareness of the long term economic and environmental benefits of renewable energy sources and technologies in Nigeria both at the public and the bureaucratic levels, as being generally low. An improvement of the awareness level was deemed by most of the participants as paramount to the successful adoption of a concept like renewable energy powered rural electrification in a fossil fuel rich state. This finding aligned strongly with the proposition in the Renewable Energy Master Plan 2005 that "public awareness and promotion will be critical elements of the drive to expand the market for renewable energy" (Energy Commission of Nigeria, 2005b, p. 10). Awareness of the potentials of renewable energy as it has been found, can be more widely disseminated by integrating renewable energy into government programmes like rural electrification, rural development, poverty alleviation, and social welfare programmes. This strategy as Flavin and Aeck (2005) showed, could help advance the effectiveness of such programmes in many cases.

Similar to the findings by Akinbami (2001), the responses suggested that due to lack of awareness, there were really no immediate incentives to motivate the people to influence the government to begin to take more decisive actions in enhancing the development, application, dissemination and diffusion of renewable energy resources and technologies in the national energy market. While this was seen as a pitiable situation, most of the participants acknowledged that increasing awareness, would be one way of enabling a wider uptake of renewable energy in power generation in Nigeria, especially for rural electrification. It was seen as one way of streamlining the numerous and conflicting information about renewable energy that has somewhat stifled its acceptance among Nigerian energy bureaucrats. This view of increasing awareness as echoed by the participants resonated with the findings by Chineke and Ezike (2010, p. 682) that "the need to increase awareness within governments of the benefits of a renewable energy strategy will serve as momentum-drivers" for the propagation of renewable energy technologies.

Advocacy as expressed by a majority of the participants was very relevant in achieving a sustainable renewable energy powered rural electrification programme. The finding implied that a very strong coalition of advocates especially among the stakeholders was needed to better position renewable energy alongside the already established fossil fuel. This followed along the lines of the argument that "for a new technology to gain ground, technology-specific coalitions need to be formed ... to advance the perception that a particular technology, e.g. solar cells or gas turbines, answers wider policy concerns" (Jacobsson and Lauber, 2006, p. 259). The participants' position on advocacy

was accentuated by the realization as pointed out by Suurs (2009, p. 98) that "the emergence of a new technology often leads to resistance from established actors. In order for an innovation system to develop, actors need to raise a political lobby that counteracts this inertia, and supports the new technology." Taking this into consideration, their supposition supported the conclusion by Van Leeuwen and Ruff (2014) that to achieve the desired targets and impacts of universal energy access, such a process requires a well-organized, structured, branded, and sustained advocacy. The participants' views on advocacy with respect to renewable energy powered rural electrification also resonates with the one shared by Mostert (2002, p. 63), "that rural electrification needed strong political and institutional champions to succeed." It is believed that the intensity that comes from such champions or advocates could pressure or influence policy makers to fix ambitious but realistic quantitative targets for rural electrification and create appropriate institutional launch pads for achieving it.

The argument for *improved bureaucratic involvement* simply called for more and better participation of the administrators in the process of implementation. Bureaucrats and administrators have been described to wield enormous influence and power in the final implementation of government decisions. Their role within the implementation agencies in shaping the actual policy outcome was acknowledged by Lipsky (2010) who emphasized that the everyday problem-solving strategies of 'street-level bureaucrats' was part of what makes up implementation. While acknowledging the importance of energy bureaucrats and their role in facilitating a wider uptake of renewable energy in Nigeria, the responses from the participants showed that the Nigerian energy bureaucrats currently operated under too many restrictions. This sentiment could be observed in the following response: *"… usually in government, there should be the technocrats who should now propose or recommend but that's the reverse in Nigeria actually ... here the technocrats try to fit into the government decision"* [MOP2]. This however shouldn't be the case as energy and expert bureaucrats have been shown to occupy a prominent role which they can use to influence policy decisions by virtue of their position (Uba, 2010).

The responses underscored the fact that energy bureaucrats and administrators in Nigeria were yet to take control of the importance of their position to start influencing the government especially on renewable energy matters. These government executives tasked with seeing to the development of electricity in Nigeria should come to the realization that they occupy a very influential and powerful position. Their responsibilities as indicated by Gruber (1987) go beyond the proverbial paper pushing, as decisions they make significantly affect the way government serves or regulates its citizens. As the analysis showed, the constraints within which bureaucrats perceive themselves, can be loosened if these bureaucrats are provided with better information and capacity development as also noted by the participants.

Legitimacy as portrayed in institutional theory by Stinchcombe (1965), is a fundamental resource that organizations deploy in their efforts to lessen the negative impact of the liabilities of newness in an industry, market, organizational field, or economic sector. This implies that *overcoming the liabilities of newness* of renewable energy technology for rural electrification was essential to strengthening its acceptance as a viable energy source. Similar to Pfeffer and Salancik (1978), and Weber (1978) the participants acknowledged legitimacy as a basis for survival and growth, and "a precondition for the

continuous flow of resources and the sustained support of organizational constituents" (Turcan, Marinova, and Rana, 2012, p. 426). Though only a few of the participants reflected on the novelty of renewable energy as an issue, the magnitude of their responses highlighted the fact that overcoming the liability of newness of renewable energy would really enhance its legitimacy in a fossil fuel dominant environment.

4.2. Relating the Finding to the Study's Research Question

Relating the findings in this category to the research question entailed the alignment of the emergent themes that made up the findings to the various research questions. Synthesis of these themes showed that the issues relating to each research question were addressed in part by most of the themes directly and in some areas by a combination of two or more themes. On the question of "How has being a fossil fuel-rich country affected the large scale adoption of renewable energy technology for rural electrification and development projects?" the general assumption was that being a fossil fuel-rich country has greatly affected interest in the use of the abundant renewable energy resources for electric power generation in Nigeria. Fossil fuel has had a considerable amount of influence on several aspect of electricity development in the country, ranging from policy to the perception of the average Nigerian regarding power generation (Ajayi and Ajayi, 2013; Akinbami, 2001). When Nigerians think of electricity what comes to mind is basically fossil fueled/large hydro and not renewable energy based generation of power. However, the findings show that the renewable energy–fossil fuel dynamics in Nigeria or the relationship between the existences of both energy sources isn't as clear cut as was initially assumed.

While data from other studies and most of the responses confirmed the initial assumption that the existence of fossil fuel has had an adverse effect on the use of renewable energy for electric power generation in Nigeria, data from this study showed that this notion wasn't as strong as was first presumed. From the views of the participants and the documents reviewed, several arguments that emerged from this study supported the fact that the existence of fossil fuel in itself wasn't really the obstacle to renewable energy development in Nigeria. The issue was with the way the energy policy and electric power industry were set up. Which has only fueled the perception that renewable energy in the presence of fossil fuels had no place in power generation in Nigeria. Improved bureaucratic involvement, was expected to lead to a more active bureaucracy that could help galvanize more involvement of the government, subsequently help plug the gaps in the policy system as well as rectify issues obstructing renewable energy development for rural electrification in Nigeria. It could also help with a reorganization of the sector which will lead to better awareness, efficiency, effectiveness and reliability. It is believed by the participants that a strategy of co-existence of both energy sources; where renewable energy is applied at the rural front and the fossil fueled/large hydro powered grid dedicated to the urban areas, should be pursued.

5. Conclusion

There have been a lot of misconceptions about the concept of a renewable energy powered rural electrification strategy in Nigeria. While the hurdles faced by a renewable energy powered programme might easily be discounted as a consequence of the existence of an abundant supply of fossil fuel in Nigeria, in reality the existence of fossil fuel shouldn't have any adverse effect on the propagation of renewable energy, as both resources can easily complement each other. If the findings from this study are to contribute to practice, there has to first be a rethink of the fossil fuel vs. renewable energy dialogue – a misconceived dialogue prevalent in the Nigerian energy and rural electricity sector. With respect to the context in which this study was carried out, it is believed that a government driven process backed by an active bureaucracy with lots of advocacy and legitimating practices which could help overcome the perceived liabilities of newness of renewable energy will be required in order to reposition renewable energy for rural electrification in a fossil fuel-rich economy like Nigeria.

In sum, it is hoped that by reflecting on the findings from this study, development administrators can find that achieving a renewable energy powered rural electrification in Nigeria is not as daunting as it seems. This study illuminates the fact that development administrators wield a lot of power in how electrification projects can and should be implemented. They have a say in specifying the requirements for rural electrification and can easily stipulate that such projects get powered by local renewable energy sources. This is one way they could help create more positive interest in the use of renewable energy in rural electrification in Nigeria.

Acknowledgements

This study was conducted under the supervision of Professor Ploy Suebvises in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Development Administration at the Graduate School of Public Administration of the National Institute of Development Administration, Bangkok Thailand. Special thanks goes to Dr. Joseph Dioha of the Energy Commission of Nigeria (ECN) for his assistance and referrals during the data gathering process, to the executives of the various agencies for participating in the interviews, and to Engineers Hassan Seghosime and Wellington Okereh for their support during the course of the programme.

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