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RESTORATION OF WATER SUPPLY IN POST-CONFLICT COMMUNITIES IN NIGERIA AND SUSTAINABLE REINTEGRATION

Adekola Paul O*, Azuh Dominic and Amoo Emmanuel O
Department of Demography & Social Statistics, Covenant University, Ota, Nigeria

Brownell Gracie
Department of Social Work, Texas A & M University, Commerce, Texas, USA

ABSTRACT

In post-conflict community rebuilding, the significance of reintegration exercise for returning displaced persons and the manner of programs put in place will determine whether they will be sustainable reintegrated or otherwise. However, there is little empirical documentation regarding critical questions such as: Can restoration of vandalized sources of water supply in their communities of origin guarantee sustainable reintegration as they return home? How can regular water supply aid their occupation to blossom so that earning a living is not difficult? What significant relationships exist between the background characteristics of returning migrants and water supply as an integral part of social reintegration strategy? Using a case study of the returning displaced persons in North-East Nigeria, this paper addresses these questions.

Keywords: Post-conflict, sustainable reintegration, communities, displaced persons, Nigeria

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1. INTRODUCTION AND RESEARCH PROBLEM

Post-conflict societies always have environmental challenges to grapple with after peace restoration. It is well-researched that through the use of chemical, biological and radioactive weapons, modern civil conflicts generate destructive effect on the environment [1]. For example, the uses of these weapons and others have generated undesirable environmental effects like desertification, internal displacement and depletion of natural resources; especially

water [2]. Environmental impact of population displacement engineered by conflict is also empirically well-researched into in Africa because environmental degradation and destruction of water table are common sights in post-conflict agrarian communities in African countries [3-4]. Though there are several effects of civil conflict on the environment but this article concentrates on such effect on water supply and how the restoration of destroyed sources of water supply in post-conflict communities in North-East Nigeria affects sustainable reintegration of displaced persons.

Water is one of the five key resources, namely, air, food, water, shelter and clothing which man cannot do without. Except air which man cannot do without for more than some seconds, water is the other resource than man cannot ignore for more than three days or else, it may be calamitous because of its multifaceted usages. Besides domestic usage such as drinking, washing, cooking and the likes, no industry can do without water. Desert encroachment and prolonged dry season have however caused water shortage in Africa. For example, Lake Chad has shrunk about three-quarter its size in the last one decade causing southward movements of herders and farmers who depend on the water from neighbouring countries like Chad, Niger, Nigeria and Cameroon.

This southward movement of herders and farmers has partly been cited as one of the factors influencing the emergence of Boko Haram terrorist group in North East Nigeria which started like small patches of clashes until it assumed terrorism dimension since 2009 (International Crisis Group (ICG), 2017; Meier et al., 2007). Boko Haram, now regarded as one of the most terrible terrorist groups globally has jeopardized the peace of North-East Nigeria since 2009 [5-6]. North-East Nigeria, the operation base of Boko Haram, comprises six states, namely; Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States. However, only three of the states: Adamawa, Borno and Yobe were more affected and have more than 90% of the casualties while the other three states are more relatively peaceful. Since 2009 till date, over 2.5 million persons have been displaced and over 2000 people have been killed in more than 100 attacks in these states (Federal Republic of Nigeria [7]. As at 2016, over 1.4 million conflict-induced internally displaced persons (CiIDPs) are in Borno State alone, with about 20% of them living in various camps and 80% residing in host communities [8].

The worst is the destruction of most social amenities such as electricity, water supply system, roads (with heavy terrorism machines) and telecommunication lines in most affected communities across the three states. Sources of water were stopped, boreholes were destroyed and cattle took over, urinated and defecated in rivers meant for domestic uses during the peak of the insurgency [8]. Irrigation dams which have also been found to be a great source of water in agrarian societies [9] were also stopped by herders through reckless use. Therefore, water shortage is number one social infrastructure challenge in post-conflict communities in North East Nigeria.

However, peace returned to the region in the last one year and the government has asked the CiIDPs who were temporarily housed in various makeshift camps in Maiduguri, Yobe and Yola to return to their communities of origin (COO). The government promised to reintegrate them sustainably with their socio-economic needs met so that they can find their feet on time as they return. Nigerian government through designated home agencies like, National Commission for Refugees, Migrants and Internally Displaced Persons (NCRMIDPs), National Emergency Management Agency (NEMA) as well as State Emergency Management Agency (SEMA) is working in partnership with some international organisations such as United Nations High Commission for Refugees (UNHCR), International Organisation for Migration (IOM), International Red Cross (ICR) and the United States Agency for International Development (USAID) to sustainably reintegrate CiIDPs back home. In addition, the North

East Development Commission (NEDC) was established in 2016 to oversee possible sustainable mechanisms for reintegrating CiIDPs [10].

However, it may be difficult to reintegrate them sustainably in 'ghost towns' as some of them were nicknamed [11] because they lack basic amenities like water and electricity. Moreover, facility survey (FS) conducted by Borno State Ministry of Health [12] shows that Water, Sanitation and Hygiene (WASH) conditions in these communities, especially newly liberated areas (NLA) are extremely poor. Previous studies from countries in Africa and beyond which have experienced similar post conflict reintegration found that it cannot be sustainable if water supply, which is an integral part of social reintegration, is not restored to their COO [13-15]. Therefore, the key objective of this research is to inquire from returning CiIDPs themselves if restoration of water supply in their COO will ensure sustainable reintegration and early settling to new livelihood. This article also examines the relationships between water supply and selected background characteristics of the CiIDPs in Nigeria. A null hypothesis stating that there is no significant relationship between the background characteristics and water need of CiIDPs in North-East Nigeria towards their sustainable reintegration is also tested.

2. DATA AND METHODS

This is a questionnaire-based survey research design. Respondents are 928 conflict-induced internally displaced adults (CiIDA), 15 years old and above, male and female, who have stayed in various IDPs camps in North-East Nigeria for at least 2 years and are set to return to their COO. They were selected through multistage and random sampling methods depending on camp condition. They were asked to rank the four basic social infrastructures: water, electricity, access roads and telecommunication in order of priority on a scale of 1-12 which infrastructure is likely to aid their sustainable reintegration. Ratio 1-3 means that the infrastructure is not a priority to their sustainable reintegration while ratios 4-6, 7-9 and 10-12 stand for infrastructures that are of low, high and highest priorities to their sustainable reintegration respectively. The essence of this decision was to attempt a pre-departure assessment of the infrastructures which is likely to aid their sustainable reintegration and quick return to normal livelihood on getting to their COO.

Univariate analysis, through the instrumentality of a frequency table examines the frequency distributions of background characteristics of the respondents while bivariate analysis examine the association between selected background characteristics of the respondents and water availability as a social infrastructure through Chi-square analysis. Chi square analysis is a statistical analysis, developed by Pearson Chi in the early 19th century and used to compare the variations between the observed data and expected data. The observed data is the data collected from the fieldwork while the expected data, otherwise called tabulated data can be called the null hypothesis in a scientific research of this nature. It helps researchers to know if the variation in the data is due to chance or in one of the variables you want to test. This analysis will adopt 0.05 as the level of significance which gives 95% confident interval on the assurance of accepting or rejecting of null hypothesis. Statistical Package for Social Sciences (SPSS) Version 20 will be used for all analyses. The description of chi-square analysis which will be used to test the hypotheses for the study is given by:

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i} \quad 1$$

Where χ^2 is chi-square symbol, $\sum$ = sum of observations, O_i = observed frequency for measurement i which is the data actually collected and E_i = is the expected (theoretical) frequency for measurement i which in this case is calculated from chi-square distribution table and asserted by the null hypothesis.

To accept or reject any null hypothesis in research using chi-square analysis, two terms are pertinent. One is degree of freedom and the other is the critical value. Since the whole idea is to check whether to accept or reject the null hypothesis, it is necessary to check whether the critical value has been exceeded or otherwise. For the degree of freedom, since two outcomes are being compared, there must be at least two outcomes. Therefore, degree of freedom is summation of all observations minus one. The implicit function of the hypothesis is;

$$BV = f(I) \quad \text{ii}$$

Where, BV is the vector for the background variables and I is the vector of infrastructures. The BV are specified as (A, SO, LE, R, G, MS, E, O, DC) meaning; Age, State of Origin, Level of Education, Religion, Gender, Marital Status, Ethnicity, Occupation and Duration in the Camp. For Vector I which considers the place of the four basic infrastructures: Water, Electricity, Telecommunication System and Roads on sustainable reintegration, it is specified as

$$I = (W, E, TS, R) \quad .iii$$

The null hypothesis (**H_0**) of this article as seen in the background to the study again states that there is no significant relationship between the background characteristics of CiIDPs in North East-Nigeria and water availability as an infrastructural need of CiIDPs towards their sustainable reintegration. To accept or reject this null hypothesis, the following steps are taken

i. A Chi-square table was created as follows;

Table 2 Chi-square Table 1

Background Variables	Water Supply as an Infrastructure	
	Chi-square Values	Accept or Reject Null Hypothesis
Observed Value	? (To be calculated from field data)	To be decided after fieldwork
Expected Value	19.68	
Degree of freedom	DF(c-1)+(r-1) = (4-1)+(9-1) = 3+ 8 = 11	

ii. Observed value was calculated from the field data using cross-tabs and Chi-square analysis.

iii. Expected value was calculated using Chi-square distribution table

To know the expected chi-square value, degree of freedom (DF) must be determined from where critical value will be looked up in the chi-square distribution table. DF is given by formula (c-1) + (r-1) which mean total number of variables in the column minus one plus total number of variables in the row minus one. The column according to Table 2 contains the infrastructures which are four in number while the row contains the background variables which is nine (9) of them as earlier specified. Applying the DF formula, this gives a total value of eleven (11) as calculated in the chi-square table above. To get the expected chi-square value, the DF which is 11 will be looked up under a critical value of 0.05 from the chi-square statistic distribution table which equals 19.68. The above null hypothesis will be rejected if the expected value of 19.68 is significantly less than the analyzed observed value from the fieldwork. Note

that the observed value will be the cumulative of all Chi-square values calculated for relationship between each background variable and water as a social infrastructure.

3. RESULTS AND DISCUSSIONS

3.1. Univariate Analysis of selected Socio-demographic Characteristics of Respondents

At the expiration of the field work, 866 questionnaires were cleaned up and eligibly used for this study. As presented in Table 2, majority (73.6%) of CiIDPs in Nigeria are from Borno State, while 4.5% and 21.9% are from Adamawa and Yobe States respectively. Descriptions of their community types show that majority (71.8%) of those communities are rural areas. About 13% of the communities are urban areas while 15.2% of them are semi-urban communities. The researcher also examines the ethnic stock of CiIDPs in Nigeria and the results shows that close to 63% of them are Kanuris and speak Kanuri majorly. Other tribes include Hausa (12.2%), Fulani (8.5%), Yoruba (2.2%) and others (14.7%). Results about the educational status of the respondents show that a larger percentage (65.1%) of them has no formal education. Those who have primary education were 16.7% of the respondents while 3.0%, 12.1% and 3.0% have nomadic primary education, secondary education and tertiary education respectively.

Inquiries into their age categories show that 19.9% of the respondents falls into 15-24 years age cohort, 38.5% are between 25-34years old, 25.4% are between 34-44 years, 11.3% are between 45-54 years and 5% are 55 years and above. As for religious affiliation, majority (93.1%) of the CiIDPs in North-East Nigeria are Muslims.

Table 2 Selected Socio-demographic Characteristics of Respondents

Socio-demographic Characteristics	Frequency	Percentage (%)
State of Origin		
Borno State	637	73.6
Adamawa State	39	4.5
Yobe State	190	21.9
Total	866	100.0
Type of Community where Displacement took Place		
Rural	622	71.8
Semi urban	132	15.2
Urban	112	12.9
Total	866	100.0
Education Level of Respondents		
No formal education	564	65.1
Primary education	145	16.7
Nomadic primary education	26	3.0
Secondary education	105	12.1
Tertiary education	26	3.0
Total	866	100.0
Age Distribution of Respondents		
15-24	172	19.9
25-34	333	38.5

35-44	220	25.4
45-54	98	11.3
55 & above	43	5.0
Total	866	100.0
Religious Affiliation of Respondents		
Christianity	55	6.4
Islam	806	93.1
Traditional religion	4	.5
Others	1	.1
Total	866	100.0
Gender of Respondents		
Female	263	30.4
Male	603	69.6
Total	866	100.0
Marital Status of Respondents		
Single	133	15.4
Married	618	71.4
Divorced	36	4.2
Widowed	64	7.4
Never Married	15	1.7
Total	866	100.0
Duration in the Camp		
1 Year	32	3.7
2 Years	175	20.2
3 Years	362	41.8
4 Years & Above	297	34.3
Total	866	100.0
Ethnicity of the Displaced		
Hausa	106	12.2
Fulani	74	8.5
Kanuri	540	62.4
Yoruba	19	2.2
Others	127	14.7
Total	866	100.0

3.2. Univariate Analysis of the Infrastructural Needs of CiIDPs to aid their Sustainable Reintegration in order of Priority

While 6.4% are Christians, 0.5% claims to be traditional worshippers. Gender distribution of the respondents shows that there are more males (69.6%) of than females (30.4%) among returning migrants in Nigeria. As for their marital status, 15.4% of them are single, 71.4% are married, 4.2% are divorced, 7.4% are widowed and 1.7% of them are never married. The category, called 'never married' are those who though live together and have one or more children but are not legally married which demographically can be referred to as cohabitation. Respondents were asked how long they have stayed in the camp. Results show that 3.7% of

them have stayed in the camp for a year, 20.2% for two years, 41.8% for three years and 34.3% for four years and above.

Four most basic infrastructures, namely; water system, electricity, telecommunication system and roads were identified and presented to the CiIDPs for the ranking. The results of their responses are presented in Table 3. About 90% of the respondents said that water provision is of highest priority to their sustainable reintegration while 3.5% said it is not a priority. More so, about 6% of them confirm that availability of water supply is of high priority if the dream of sustainable reintegration is to be achieved. Cumulatively, it means approximately 96% of the returning migrants believe that sustainable reintegration is not a possibility if destroyed water supply sources are not restored to their COO. Similar results have been found in post-conflict regions in Africa, particularly in Freetown, Sierra Leone where it was found that urban and peri-urban agriculture which engender food security, safe-guard good post-conflict recovery season and social cooperation will drag without adequate water supply [16]. Note that the researcher only singles out water analysis for discussion from Table 3 since that is what this paper is based.

Table 3 Frequency Distribution of Infrastructural Needs of CiIDPs in Order of Priority

Infrastructural Needs	No Priority		Low Priority		High Priority		Highest Priority		Total	
	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)
Water Supply	30	3.5	8	0.9	51	5.9	777	89.7	866	100
Electricity	35	4.0	35	4.0	176	20.3	620	71.6	866	100
Telecommunication System	40	4.6	62	7.2	95	11.0	669	77.3	866	100
Roads	34	3.9	37	4.3	111	12.8	684	79.0	866	100

Source: Researcher Field survey, 2018

3.3. Relationships between Water Supply as a Social Infrastructural and Selected Background Characteristics of CiIDPs

To determine if there is significant relationship between the background characteristics of CiIDPs and water supply as a social infrastructure, bivariate relationships were sought through cross tabulations and Chi-square analysis to establish such. For state of origin, results show that only about 1% of the respondents from Borno State do not see water supply (WS) as a priority while about 97% of them said it of highest priority to their sustainable reintegration (SR). In Yobe State, 1.6% of them said WS is not a priority to their SR while 76.3% said it of highest priority to their SR. It is only in Adamawa State that more respondents (53.8%) said that WS is not their priority as compared to those who said it of highest priority (43.6%). The reason for this may be partly because most displaced persons in Adamawa State did not have their communities vandalized like it happened in the other two states where villages were completely razed down. There is also a significant relationship between WS and state of origin of the respondents (X^2= 419.138; p< 0.001).

Less than 1% of the respondents from the rural areas said that WS is not a priority while majority (96%) of them said it of highest priority to their SR. More than 67% of those who live in semi-urban areas said WS is important to their sustainable reintegration while majority (81.2%) of those who reside in urban areas also said WS is of utmost importance to their sustainable reintegration. There is also a significant relationship between WS and place of residence of the respondents (X^2= 141.418; p< 0.001). For ethnicity, majority (87.7%) of the

Hausas said that WS is of highest priority to their sustainable reintegration while 93.1%, 100% and 63.5% of the Kanuris, the Yorubas and the Fulanis affirm same respectively. There is also a significant relationship between WS and ethnicity of the respondents (X^2= 159.755; p< 0.001). As for their age categories, 97.1% of those between the ages of 12 and 24 years said WS is of highest priority to their sustainable reintegration. For those in age cohort 25-34 years of age, 1.2% of them said that WS is not a priority to their SR while 97.1% of them said it is of highest priority. Other age groups, 35-44 years, 45-54 years and 55 years & above ranked WS as 84.1%, 95.9% and 97.7% respectively as a top priority to their sustainable reintegration.

As for education, less than 1% of those without any formal education said that WS is not a priority to their SR. For those with primary and nomadic primary education, 82.1% and 96.2% of them respectively said that WS is of utmost priority while 88.5% of those with tertiary education also affirm same. About 95% of Christians, 90% of Muslims and 75% of traditional worshippers said that WS is of utmost importance to their sustainable reintegration as seen in Table 4. About 92% of the female respondents and 90% of the male respondents said that WS is of utmost importance to their sustainable reintegration. Relationships between how long displaced persons have stayed in the camp and desire for WS as they prepare to return to their communities were also sought and the results as presented in Table 4 shows that almost 100% of those who are in the camp for just one year sees WS as utmost in their pursuit of sustainable reintegration. While 78.5% of those who have stayed in the camp for two years see WS as an utmost priority; 93.4% and 90.6% of those who have stayed in the camp for three years and four years & above respectively also affirm same.

Lastly, relationship between WS towards sustainable reintegration of CiIDPs and their marital status was also explored. Results show that 94.7%, of those who are single see water as the highest priority among other infrastructures as they return home while 87.9% of those who are married affirm same.

Table 4: Percentage Distribution of Selected Background Characteristics and Water Supply

Variable	Water Supply				Chi Square	P-value
	No Priority	Low Priority	High Priority	Highest Priority		
State of Origin						
Borno	6(0.9%)	6(0.9%)	10(1.6%)	615(96.5%)		
Adamawa	21(53.8%)	1(2.6%)	0(0.0%)	17(43.6%)		
Yobe	3(1.6%)	1(0.5%)	41(21.6%)	145(76.3%)	419.138	0.000
Residence Type						
Rural	4(0.6%)	4(0.6%)	17(2.7%)	597(96.0%)		
Semi-urban	23(17.4%)	11(0.8%)	19(14.4%)	89(67.4%)		
Urban	3(2.7%)	31(2.7%)	15(13.4%)	91(81.2%)	141.418	0.000
Ethnicity						
Hausa	2(1.9%)	4(0.6%)	17(10.4%)	93(87.7%)		
Fulani	21(28.4%)	1(1.4%)	5(6.8%)	47(63.5%)		
Kanuri	5(0.9%)	6(1.1%)	26(4.8%)	503(93.1%)		
Yoruba	0(0.0%)	0(0%)	0(0.0%)	19(100.0%)		
Others	2(1.6%)	1(0.8%)	9(7.1%)	115(90.6%)	159.755	0.000
Age Group						
15-24 years	2(1.2%)	0(0.0%)	3(1.7%)	167(97.1%)		

25-34 years	2(1.2%)	0(0.0%)	3(1.7%)	167(97.1%)		
35-44 years	22(6.6%)	4(1.2%)	27(8.7%)	280(84.1%)		
45-54 years	0(0.0%)	2(2.0%)	2(2.0%)	94(95.9%)		
55 years & above	0(0.0%)	1(2.3%)	0(0.0%)	42(97.7%)	40.600	0.000
Education Level						
No education	5(0.9%)	5(0.9%)	36(6.4%)	518(91.8%)		
Primary education	22(15.2%)	1(0.7%)	3(2.1%)	719(82.1%)		
Nomadic pry edu	10(3.8%)	0(0.0%)	0(0.0%)	25(96.2%)		
Secondary education	21(1.9%)	0(0.0%)	113(10.5%)	92(87.6%)		
Tertiary education	0(0.0%)	2(7.7%)	1(3.8%)	23(88.5%)	94.743	0.000
Religion						
Christianity	1(1.8%)	1(1.8%)	1(10.9%)	52(94.5%)		
Islam	29(3.6%)	7(0.9%)	49(6.1%)	721(89.5%)		
Traditional religion	0(0.0%)	0(0.0%)	1(25.0%)	3(75.0%)		
Others	0(0.0%)	0(0.0%)	0(0.0%)	1(100%)	5.588	0.780
Gender						
Female	5(1.9%)	21(0.8%)	15(5.7%)	241(91.6%)		
Male	25(4.1%)	6(1.0%)	36(6.0%)	536(88.9%)	2.949	0.400
Duration in Camp						
1year	0(0.0%)	0(0.0%)	0(0.0%)	32(100.0%)		
2 years	23(13.1%)	2(1.1%)	12(6.9%)	138(78.5%)		
3 years	4(1.1%)	5(1.4%)	15(4.1%)	338(93.4%)		
4 years & above	3(1.0%)	1(0.3%)	24(8.1%)	269(90.6%)	71.423	0.000
Marital Status						
Single	1(0.8%)	3(2.3%)	3(2.3%)	126(94.7%)		
Married	28(4.5%)	4(0.6%)	3(8.3%)	543(87.9%)		
Divorced	0(0.0%)	0(0.0%)	3(8.3%)	33(91.7%)		
Widowed	1(1.6%)	1(1.6%)	1(1.6%)	61(95.3%)		
Never married	0(0.0%)	0(0.0%)	1(6.7%)	14(93.3%)	18.574	0.099

Source: Researcher Field work, 2018. * Significant at 0.05 level of significance; * $\sum X^2$ = 954.188

More than 91% of those who are divorced said WS is of highest priority to their SR while 95.3% and 93.3% of those who are widowed and never married respectively said that WS is of utmost importance to the sustainability of their return. It is important to state that of all the nine background characteristics examined vis-à-vis their relationships with WS, only religion, gender and marital status do not have significant relationship with it. This simply means that no matter your gender, marital status and religion, WS is a necessity for all without which reintegration cannot be sustainable. All the other six background characteristics have significant relationships ($p < 0.001$) with WS and the cumulative Chi-square value for the relationships between the nine background characteristics and WS is 954.188. The null

hypothesis of this article which states that there is no significant relationship between WS and the background characteristics of the CiIDPs is therefore rejected because the expected value of 19.68 is significantly less than the observed value which is the cumulative Chi-square value which is 954.188.

Water supply was ranked highest (89.7%) among the four social infrastructures needed by the returning migrants towards their sustainable reintegration. This of course is not a surprise because every society needs water for many things, ranging from drinking to cooking, not leaving out industrial purposes. As for this particular region where this insurgency took place, the North East Nigeria, is a dry region with Lake Chad as the only durable source of water for irrigation purpose at the heat of dry season. This is important to bring to fore bearing in mind that more than 55% of our respondents were farmers prior to being displaced. So, there is the likelihood that they might return to farming when the reintegration exercise is over. So, availability of water to irrigate their farm crops and for other domestic uses is a sine-qua-non. Although a study by one Subedi [17] in Nepal has been found that a cash-based reintegration where returning migrants were given money has been found to achieve some level of success in reintegration. However, it is important to note that money is not drinkable; neither can any amount given to any returning migrant be enough to supply all the volume of water that will be needed for all domestic and farm uses being an agrarian society. Hence, water supply as an integral part of social reintegration is desirable no matter the amount given because water supply is a social amenity, meaning that it the responsibility of the government to supply and is too costly for an individual to provide let alone a poor returning migrant. Besides, if water is not available in an agrarian society of this nature, adolescents may to substance abuse [18] since youth that are not busy have been found guilty of this in Africa.

4. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This article examines water supply as one of the key social infrastructures that can aid sustainable reintegration of CiIDPs in North-East Nigeria. Results from this study shows that sustainable reintegration is not possible without adequate water supply in the communities to which the migrants are returning. The study concludes by stating unequivocally that the days of asking CiIDPs to return home just because peace has been restored are over. Social infrastructures, especially water supply in their communities must be restored to ensure SR. Having drawn the conclusion of this study, the following recommendations should be followed by the government and other stakeholders to ensure that all CiIDPs in Nigeria are sustainable reintegrated.

- Basic infrastructures especially water should be in place in the COO of returning migrants before they are returned home.
- Security posts should be mounted in remote areas in North-East Nigeria to prevent easy penetration of Boko Haram insurgents in those remote communities to vandalize social amenities.

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