

International Journal of Arts and Humanities  
(IJAH) Ethiopia  
Vol. 7 (2), S/No 25, APRIL, 2018: 105-116 ISSN:  
2225-8590 (Print) ISSN 2227-5452 (Online) DOI:  
<http://dx.doi.org/10.4314/ijah.v7i2.13>

---

## **Local Institutions and Adaptive Capacity of Rural Households in the Niger Delta**

**Jack, Jackson T.C.B**

Department of Sociology & Anthropology,  
Federal University, Otuoke  
Bayelsa State, Nigeria

Mobile: [+2348037598165](tel:+2348037598165)

Email: [jackjt@fuotuke.edu.ng](mailto:jackjt@fuotuke.edu.ng), [orcid.org/0000-0003-4326-8544](http://orcid.org/0000-0003-4326-8544)

**Eke, Paul, Prof.**

Department of Sociology,  
University of Port Harcourt,  
Rivers State, Nigeria.

Mobile: [+2348033408738](tel:+2348033408738)

### **Abstract**

The study examined the role local institutions play in promoting adaptive capacity of households to environmental degradation in the Niger Delta region of Nigeria. The survey was conducted amongst 610 households across Rivers, Delta and Bayelsa states. The questionnaire instrument was employed in eliciting data from the respondents. The study shows that respondents belonged to about 106 formal and informal local institutions spread across the study communities. Findings revealed that local institutions serve as safety nets and sources of local insurance as they provide households opportunities for resources and materials exchange as well as galvanizing collective action that promotes livelihoods and adaptive capacity. The hypothesis test result indicated that membership to local institutions has a significant effect on adaptive capacity. The study hence concluded that membership to local institutions significantly promotes the capacity of households to adapt to environmental degradation in the Niger Delta. The study hence recommends that the institutional capacities of these institutions should be enhanced through knowledge and resource sharing by means of increasingly engaging with external actors like the government and civil society who can provide external support to the communities.

**Keywords:** Local Institutions, Adaptive Capacity, Rural Households, Niger Delta.

### **Introduction**

Local institutions are informal social networks that are either defined by kinship, ethnicity, religion, and friendship or formal groups organized along mutual trust and reciprocity which facilitates informal and

formal exchange of information, materials and resources (Bernier & Meinzen-Dick, 2014). Local institutions hence could be informal associations such as kin groups or formal associations such as farmer's union, community based organizations, religious groups and so on. These institutions are referred to as local because they are community based; as such they are known to not only provide platform for exchange of resources and materials but promote community self-help and collective action (Daivi, 2012). More so, within the context of adaptation to environmental degradation, the role local institutions play in building sustainable livelihoods and promoting adaptive capacity is gradually gaining attention. This is so because poor and natural resource dependent households are known to bear the brunt of environmental degradation more. In the oil rich Niger Delta region for instance, majority of the households fall in poverty due to the large scale destruction of their fishing and farming livelihood systems especially by oil spillages (Ejiba, Onya & Adams, 2016; Idodo-Umeh & Ogbeibu, 2010; Ojimba, Akintola, Anyanwu, & Manilla, 2014) and gas flaring (Eregha & Irughe, 2009; Kadafa, 2012). In the face of such livelihood insecurities arising from environmental degradation coupled with low state capacity, Agrawal, Kononen and Perrin (2009) posit that the poor and marginal groups rely on local institutions to build resilience, reduce vulnerability and mediate collective action. This they argue is achieved through the indispensable functions local institutions perform such as provision of infrastructure and services, disaster response planning, regulation of property rights, information dissemination, coordination with decision-makers at other levels for external support for adaptation, and organizing social action. Similarly, Bhattamishra and Barrett (2010 cf. Bernier & Meinzen-Dick, 2014) posited that community-based organizations perform various risk-management functions such as provision of social assistance, public goods, mutual insurance services, insurance for major life events, savings and credit facilities, and so on. Di Gregorio, et al. (2012) on their part added that local institutions have the capacity to promote access to outside actors and resources. Supporting the above positions, Tumbo, et al. (2013) averred that social networks are known to be trusted and reliable sources of information on strategies, resources and new technologies that could promote adaptation. In addition, Agrawal (2010: 179-180) identified three roles that groups and local organizations play in the adaptation process. Firstly, he argued that local institutions structure environmental risks and variability, and thereby the nature of climate impacts and vulnerability. Secondly, they create the incentive framework within which outcomes of individual and collective action unfold. Lastly, they are the media through which external interventions reinforce or undermine existing adaptation practices.

In view of the foregoing, the relevance of informal and formal local institutions in building adaptive capacity cannot be overemphasized. It is therefore pertinent to empirically demonstrate this by documenting specific localized case studies of how local institutions promote adaptation amongst poor and marginal groups. It is in the light of this that the study examined the role of local institutions in promoting adaptive capacity of rural households in the Niger Delta region of Nigeria. The study took critical stock of the existing formal and informal institutions and their roles in promoting adaptive capacity in selected oil producing communities in the region.

### **Empirical Case Studies**

The theoretical literature as presented in the previous section has demonstrated that local institutions play a significant role in promoting adaptive capacity. Some empirical studies in this regard are therefore examined to substantiate the earlier submissions. For instance, Degefa (2009) in his study examined the role of local institutions in household food security in Amhara region of Ethiopia. Findings from his study show that local institutions that are built on mutual trust between sedentary peasants and agro-pastoralists such as *Kaya*, *Kire*, *Tassiga*, *Zekka* and *Hirpa* provides spiritual, material and psychological supports for members while acting as some sort of a local source of insurance. Similarly, the findings from a research conducted by Daivi (2012) on the role of local collective action in livelihood diversification and adaptation to climate change shows that the informal

associations are a powerful adaptation mechanism among the Kuria people of North-West Tanzania. Through the incorporation of historically significant adaptation strategies, local associations were able to address the wider vulnerability context of their communities. These associations also enhance mitigation of risks and ensured greater social inclusion of the poor in the communities through the adoption of institutional practices such as communal pooling of work, money and other resources. In another study, Bernier and Meinzen-Dick (2014) focused on the Ethiopian community organization called ‘Iddirs’ and its role in sustainable livelihoods. Findings from the study indicate that the Ethiopian Iddirs are devoted to knowledge acquisition, innovation, and their flexibility in approach has aided the metamorphosis of their mandate into provision of health insurance products for their members. Moreover, it is also reported that the Ethiopian ‘Iddris’ possess effective governance regulations, enforcement processes and accounting mechanisms. In addition, these local organizations aid communities cope with uncertainties and unexpected expenses. In the same vein, Kiroki (2015) in his recent study focused on social capital and rural livelihoods in Kenya. Findings from the study indicate that households are able to generate alternative livelihood sources which are supportive of non-monetary forms of exchange as a result of community based social networks. The implications thereof are that reliance on non-monetary exchange reduces transactions demand for cash thereby promoting household savings.

In view of the foregoing, the few empirical case studies reviewed has demonstrated the significance of informal and formal community based institutions in building sustainable livelihoods and promoting adaptive capacity to environmental shocks and changes.

**Materials and Methods**

The study was conducted in 6 communities selected from Rivers, Delta and Bayelsa states using the cross-sectional survey design. A total of 610 households were sampled using the systematic random sampling technique where 126 and 80 households were respectively selected in Bille and Bodo communities of Rivers state; 108 and 116 households were respectively selected for Polaku and Ogboinbiri communities of Bayelsa state; while 92 and 88 households were selected respectively for Umutu and Kokodiagbene communities of Delta state (Table 1).

States	Upland Communities	Number of Respondents	Riverine Communities	Number of Respondents	Total
Bayelsa	Polaku	108 (17.7%)	Ogboinbiri	116 (19%)	224
Delta	Umutu	92 (15.1%)	Kokodiagbene	88 (14.4%)	180
Rivers	Bodo	80 (13.1%)	Bille	126 (20.7%)	206
Total		280		330	<b>610</b>

Source: Field Work, 2018

The household survey was conducted with the use of structured questionnaires as well as observational technique. The content validity approach was used to ensure that the research instrument measures what it ought to measure. Also, the ChronbactAlpha statistical test was used to generate a reliability coefficient of 0.63 for the research instrument.

More so, the Statistical Package for Social Sciences software (SPSS, Version 20) and Microsoft Excel software (Version 2010) was used to run uni-variate and bivariate analysis. In addition, whereas descriptive statistics were used to analyse the data presented with frequency tables, charts, and graphs, the One Sample T Test statistics was used to test the research hypothesis at the 0.05 level of significance using the SPSS software.

### Findings and Discussions

#### i. Socio-Demographic Status of Respondents

The socio-demographic characteristics of the respondents as presented in table 2 reveals that amongst the 610 respondents, 316 (51.8%) of them are men, while 294 (48.2%) are women. Also, whereas 602 (98.7%) of the respondents are Christians, 2 (0.3%) are Muslims, 4 (0.7%) are Traditionalists, and 2 (0.3%) are of other faiths.

The age distribution of the respondents show that whereas 30 (4.9%) of the respondents are less than 20 years, 130 (21.3%) are between 20-29 years, while 192 (31.5%) are between 30-39 years. In addition, whereas those between the age range of 40-49 years are 124 respondents constituting 20.3% of the sample, 96 (15.7%) of them are between the age category of 50-59 years, while 38 (6.2%) of the respondents are above 60 years.

With regards to the educational level of the respondents, the data indicates 70 (11.5%) respondents with no formal education, 82 (13.4%) with primary education, 318 (52.1%) with secondary education, 122 (20%) with tertiary education, and 18 (3%) with vocational education. The data also show that while 174 (28.5%) of the respondents are single, 410 (67.2%) are married, 4 (0.7%) are separated or divorced, while 22 (3.6%) are widowed.

In addition, whereas 168 (27.5%) of the respondents are farmers, 136 (22.3%) are fishermen, 150 (24.6%) are traders, 44 (7.2%) are artisans, 48 (7.9%) are civil servants, 22 (3.6%) are either oil company staff or contractors, 14 (2.3%) are engaged in other livelihood activities, while 28 (4.6%) of them are unemployed.

Lastly, the data on the income levels of the respondents indicates that whereas respondents who earn an average income of less than ₦ 10, 000 per month are 198 constituting 32.5% of the sample, those who earn an average monthly income of between ₦10, 000 to ₦ 30, 000 are 238 respondents constituting 39% of the sample. Furthermore, the data show that the respondents who earn an average monthly income of between ₦ 31, 000 and ₦ 50, 000 are 80 constituting 13.1% of the sample, and those who earn an average monthly income of ₦51, 000 and above are 94 constituting 15.4% of the respondents.

**Table 2: Table Showing Socio-Demographic Characteristics of Respondents**

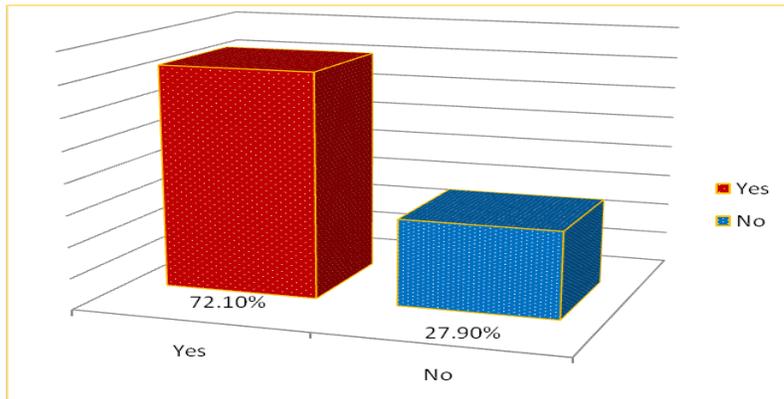
Variables	Frequencies (n = 610)	Percentages (%)
<b>1. Gender</b>	<b>610</b>	<b>100</b>
Male	316	51.8
Female	294	48.2
<b>2. Age</b>	<b>610</b>	<b>100</b>
Less than 20	30	4.9
20-29	130	21.3
30-39	192	31.5
40-49	124	20.3
50-59	96	15.7
60 and above	38	6.2

<b>3. Educational Attainment</b>	<b>610</b>	<b>100</b>
No Formal Education	70	11.5
Primary	82	13.4
Secondary	318	52.1
Tertiary	122	20
Vocational	18	3
<b>4. Marital Status</b>	<b>610</b>	<b>100</b>
Single	174	28.5
Married	410	67.2
Divorced/Separated	4	0.7
Widow/Widower	22	3.6
<b>5. Religious Affiliation</b>	<b>610</b>	<b>100</b>
Christianity	602	98.7
Islam	2	0.3
Traditionalist	4	0.7
Others	2	0.3
<b>6. Primary Occupation</b>	<b>610</b>	<b>100</b>
Farming	168	27.5
Fishing	136	22.3
Trading	150	24.6
Artisan	44	7.2
Civil Service	48	7.9
Oil Company Staff/Contractor	22	3.6
Unemployed	28	4.6
Others	14	2.3
<b>7. Average Monthly Income</b>	<b>610</b>	<b>100</b>
Below N10,000	198	32.5
N10,000 – N30,000	238	39
N31,000 – N50,000	80	13.1
N51,000 and above	94	15.4

Source: Fieldwork, 2018

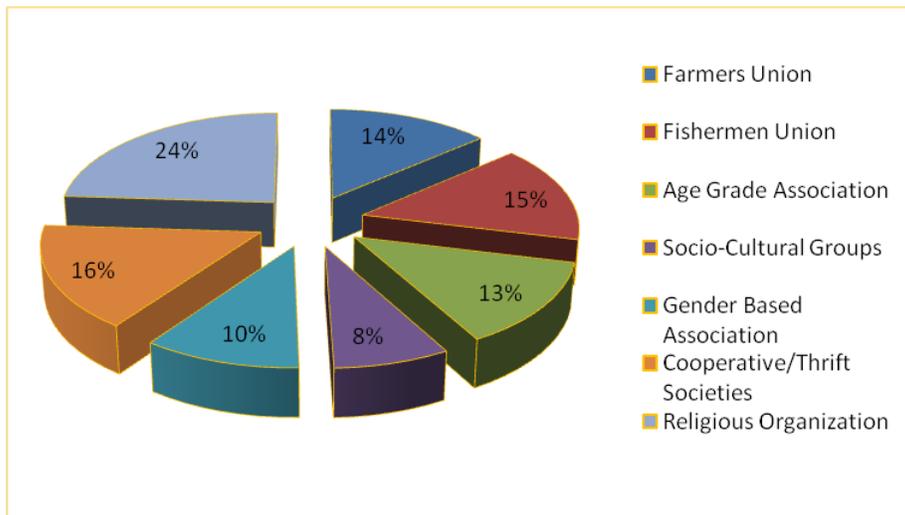
## ii. Membership to Community Associations

Membership to informal and formal networks of association is a strong indicator of social capital. Findings from the survey as indicated in figure 1 reveals that whereas 72.1% of the respondents belong to one form of informal or formal networks of community associations, 27.9% of them do not belong to any community based association.



**Figure 1: Percentage of Households Belonging to Community Associations (Fieldwork, 2018)**

Further investigation into the categories of community based associations members of the surveyed communities belong to was conducted.



**Figure 2: Percentage Distribution of Respondents by Community Associations (Fieldwork, 2018)**

Findings as indicated in figure 2 revealed that whereas 24% of the respondents belong to faith based organizations especially in churches, 16% of the respondents belong to local thrift societies/co-operatives, while 15%, 14% and 13% belong to fishermen union, farmers union and age grade associations respectively. More so, 10% of the respondents belong to various gender based associations while 8% of the respondents belong to diverse socio-cultural groups across the communities. In addition, table 3 provides in specific names of the diverse associations respondents belong to across the study communities.

Table 3: Some Community Associations Respondents Belong to Across Communities	
<b>Bodo Community</b>	
<ul style="list-style-type: none"> <li>i. Catholic Women Association</li> <li>ii. Patriotic Friends of Bodo</li> <li>iii. Good Women (RCCG)</li> <li>iv. Bodo Agro-Fisheries Co- operative Society</li> <li>v. Bara Savings Society</li> <li>vi. Circle 15 of Bodo</li> <li>vii. SPACO 78</li> <li>viii. Bodo Central Working Committee</li> <li>ix. Mates 83 of Bodo City</li> <li>x. Barile Fishing Corporative Society</li> </ul>	<ul style="list-style-type: none"> <li>xi. Progressive Women Association</li> <li>xii. Federation of Bodo Students</li> <li>xiii. Golden Friends Association</li> <li>xiv. KanuTete</li> <li>xv. Amanikpo Society</li> <li>xvi. Lekolle Bee Tonu</li> <li>xvii. Banna Savings Group</li> <li>xviii. Bodo Welfare Association</li> <li>xix. Barbers Association of Bodo</li> <li>xx. Christian Association of Nigeria (CAN)</li> </ul>
<b>Bille Community</b>	
<ul style="list-style-type: none"> <li>i. Bille Women’s Forum</li> <li>ii. Cheeri Age Group</li> <li>iii. AsapuOgbo of Opu Imo Community</li> <li>iv. 1956 Cultural Age Group</li> <li>v. District Church Council</li> <li>vi. Flourish Age Group</li> <li>vii. SekiapuOgbo</li> <li>viii. People’s Concerned Club of Bille</li> <li>ix. Ebi-LahAsawo</li> <li>x. 1951 Cultural Age Group</li> </ul>	<ul style="list-style-type: none"> <li>xi. 1958 Development Association</li> <li>xii. K-Club 57</li> <li>xiii. Independence Peer Group</li> <li>xiv. Unique Age Group</li> <li>xv. 67 United</li> <li>xvi. Patriotic Organization 55</li> <li>xvii. Oku (Local Thrift Associations)</li> <li>xviii. Blessed Women Youth Group</li> <li>xix. Beinma Fishing &amp; Credit Society</li> <li>xx. Youth Liberation Body</li> </ul>
<b>Polaku Community</b>	
<ul style="list-style-type: none"> <li>i. MEK Cooperative Society</li> <li>ii. December Contributions (Local Thrift)</li> <li>iii. Nome Brothers Association</li> <li>iv. United Friends Club of Polaku</li> <li>v. Givers Never Lack Association</li> <li>vi. Club 60 of Gbarain</li> <li>vii. Polaku Cassava Farmers Union</li> <li>viii. Kuradi Association of Polaku (GASIN)</li> <li>ix. Women Guild, Anglican Communion</li> </ul>	<ul style="list-style-type: none"> <li>xi. Polaku Youth Cabinet</li> <li>xii. Forum Early Warning &amp; Early Response</li> <li>xiii. Golden Friends Association</li> <li>xiv. United Friends of Bayelsa</li> <li>xv. Hot Ladies of Polaku</li> <li>xvi. One Voice in Progress Corporative Society</li> <li>xvii. First Daughter Club of Polaku</li> <li>xviii. Gas Alert for Sustainable Initiative</li> <li>xix. Mercy &amp; Son Cooperative Society Ltd</li> </ul>
<b>Ogboinbiri Community</b>	
<ul style="list-style-type: none"> <li>i. June Contribution Group (Local Thrift)</li> <li>ii. One Voice Youth</li> <li>iii. Ogboinbiri Landlord Association</li> <li>iv. Ogboinbiri Youth Association</li> <li>v. Peace Ladies of Ogboinbiri</li> <li>vi. Men on Ground</li> <li>vii. Press Club of Ogboinbiri</li> <li>viii. Tariyabuna Thrift Society</li> <li>ix. Perewari Multi-Purpose Corporative</li> <li>x. Sele-KulumaOgbo Ltd</li> </ul>	<ul style="list-style-type: none"> <li>xi. Otu-ye and Osi Contribution Groups</li> <li>xii. Wanikefie Farmers Union</li> <li>xiii. BiribenYai-Kedoumini Corporative</li> <li>xiv. AmaUyadonOgbo (Club)</li> <li>xv. Peace &amp; Progress Fisheries Association</li> <li>xvi. Boat Drivers Association of Ogboinbiri</li> <li>xvii. AyibaIngo Farmers’ Cooperative Society Ltd.</li> <li>xviii. TariladeiOgbo Farmers’ Cooperative Ltd.</li> <li>xix. AyibakenOgbo Women Farmers’ Cooperative</li> <li>xx. Bolouwenimo Women Farmers’ Cooperative</li> </ul>
<b>Kokodiagbene Community</b>	
<ul style="list-style-type: none"> <li>i. Progress Group of Kokodiagbene</li> <li>ii. Kokodiagbene Elders in Council</li> <li>iii. Kokodiagbene Youth Executive</li> <li>iv. Dollars Ladies of Kokodiagbene</li> </ul>	<ul style="list-style-type: none"> <li>vi. Group A Club of Kokodiagbene</li> <li>vii. Group B Club of Kokodiagbene</li> <li>viii. Ebi-EreboOgbo</li> <li>ix. Perema Fans Club</li> </ul>

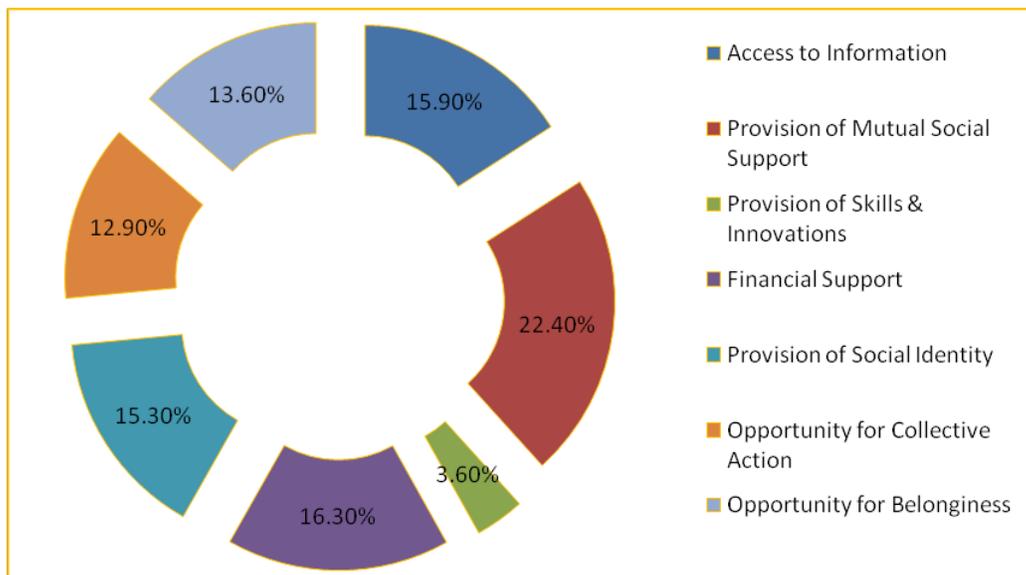
v. Ebiyoro-UboOgbo	x. Barrister Fans Club
<b>Umutu Community</b>	
i. Umutu Development Union	xi. Otu-Onugbo Age-Grade Association
ii. Etu-Eka-Olu (Artisan Group)	xii. Otu-Olile Age-Grade Association
iii. Ezinwa-Li-Aku Corporative Society	xiii. Otu-Ofu Age-Grade Association
iv. Otu-Ogor Na – So Club	xiv. Akapo-Otu Age-Grade Association
v. Otu-Chukwuka Club	xv. Otu-Okpoju Age-Grade Association
vi. Umutu United Social Club	xvi. Otu-Maya Age-Grade Association
vii. Eminent Club of Umutu	xvii. Otu-Ibarawo Age-Grade Association
viii. OtuAya Age-Grade Association	

Source: Fieldwork, 2018

### iii. Role of Local Institutions in Promoting Adaptive Capacity

Further probe into the role local institutions play in building the adaptive capacity of members of such community associations reveal that most respondents identified several benefits accruable to them as a result of their membership to such community based associations.

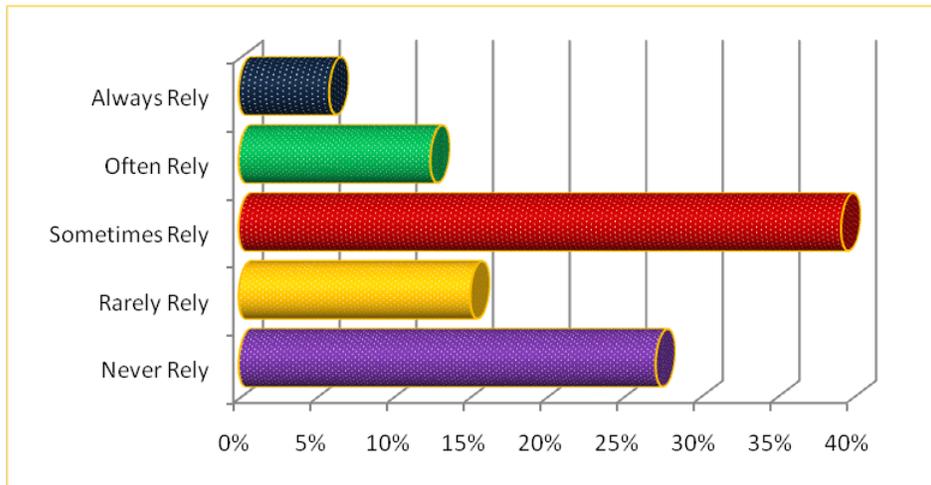
Findings from the survey as presented in figure 3 indicates that whereas 22.4% of the respondents argued that community association provides them opportunity for mutual support, 15.3% reported it provides them social identity, while 12.9% averred it provides them opportunity for collective action and 13.6% of the respondents reported that it provides them opportunity to fulfill their needs for belongingness. More so, 16.3% of the respondents reported that they have received financial support from their respective organizations, while 15.9% of them have had access to information as a result of their membership to a community association, 3.6% of them reported to have had opportunities to learn new skills and have access to new technology and innovations.



**Figure 3: Respondents Distribution by Benefits of Belonging to Local Association (Fieldwork, 2018)**

**iv. The Role of Informal Networks**

In furtherance, findings from the survey also indicate that informal networks of association forms a strong form of social capital base in the surveyed communities. This is evident as a majority of respondents in the sample reported to have strong connections and networks of relationship with other members of their communities defined and sustained by kin ties, marriage and friendship. The survey reveals that these strong informal networks are instrumental in promoting adaptive capacity in communities as they serve as safety nets for individuals and households in times of need and distress such as hardships arising from environmental degradation.

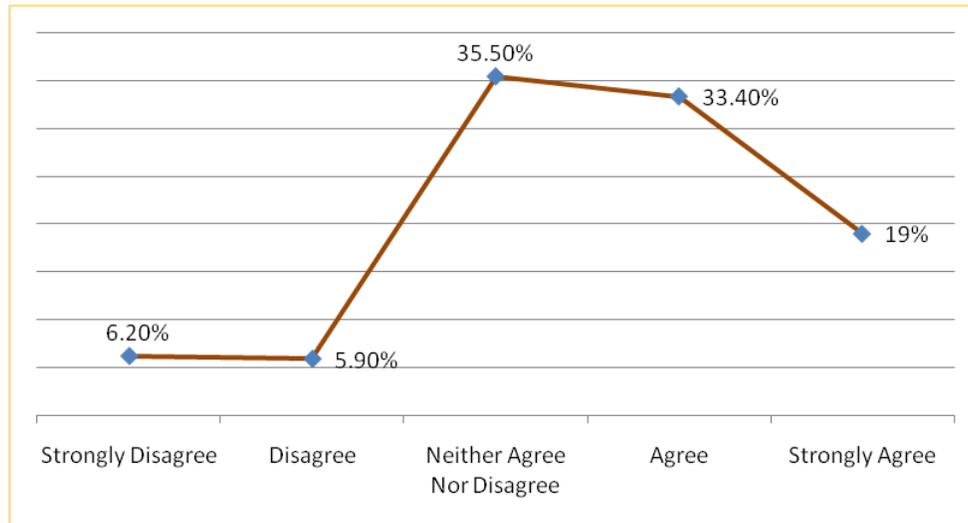


**Figure 4: Reliance on Relatives, Friends and Neighbours for Mutual Support (Fieldwork, 2018)**

Furtherprobe into the intensity of reliance on relatives and friends for mutual support amongst the respondents as shown in figure 4 indicates that whereas 39.3% of the respondents argue they sometimes rely on relatives, friends and neighbours for mutual support, 12.5% argue they often rely, while 5.9% reported that they always rely on friends, relatives and neighbours for mutual support. However, on the other hand whereas 15.1% of the respondents argue they rarely rely on relatives, friends and neighbours for mutual support, 27.2% of the respondents argued they never rely on relatives, friends and neighbours for mutual support in times of distress.

**v. Test of Hypothesis**

The centralobjective of this study was to investigate if local institutions promote adaptive capacity in the study communities. In ascertaining this, respondents were asked if their membership to community association has promoted their capacity to adapt to the challenges of environmental degradation in their communities.



**Figure 5: Percentage Distribution of Respondents by Whether Membership to Community Association Promotes Adaptive Capacity (Fieldwork, 2018)**

The findings as shown in figure 5 indicate that whereas 6.2% of the respondents strongly disagreed with the notion, 5.9% of them disagreed with the notion. However, while 35.5% of the respondents neither agreed nor disagreed with the notion, 33.4% of the respondents agreed with the notion and 19% of the respondents strongly agreed with the notion that membership to community networks of association promotes their capacity to adapt to environmental degradation.

In view of the foregoing analysis, in order to test if membership to community networks of association significantly promotes adaptive capacity of households in the sampled communities, the research hypothesis was tested using the one sample t test at the 0.5 level of significance on the SPSS software.

**H<sub>0</sub>:**Membership to community network of associations do not significantly promote the capacity to adapt to environmental degradation

**Decision Rule:** If *p* is ( $\leq 0.05$ , the test is significant), ( $\geq 0.05$ , the test is not significant).

**Table 4: One Sample Test For Hypothesis**

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	Descriptive Statistics	
					N	Mean
My Membership With Community Based Associations Has Provided Me Resources That Has Promoted My Adaptive Capacity To Degradation	12.379	609	0.000	0.53115	610	3.5311

Source: Author’s Computation Based on SPSS Output.

Table 4 shows the data output of the position of the respondents to the question on whether membership to community based association provides resources that enables adaptive capacity. The descriptive statistics indicates that the respondents recorded a mean score of 3.511 which is higher than the test value of 3 (the neutral response i.e. neither agree nor disagree). More so, since the  $p$  value 0.00 is less than 0.05, the test is statistically significant. Going by the decision rule, the null hypothesis is thereby rejected. This therefore implies that the respondents who were surveyed agreed that membership to community associations have significantly enhanced their capacity to adapt to environmental degradation.

### Conclusion

The study examined the role local institutions play in building adaptive capacity of households and communities in oil impacted communities of the Niger Delta. The findings from the study have shown that individuals and households rely on informal networks of associations and formal local institutions in their communities for mutual exchange of resources and materials which support their livelihoods. The study has demonstrated the efficacy of local institutions in promoting adaptive capacity especially in situations of environmental stress and livelihood insecurities. These institutions acts as safety nets and sources of local insurance for poor households as it provides them opportunities to pull resources together and pursue mutually beneficial collective action. The findings from the study hence corroborate earlier studies by Degefa (2009), Daivi (2012), Bernier and Meinzen-Dick (2014), and Kirori, G.N (2015) that local institutions are veritable tools for building rural livelihoods and enhancing adaptive capacity. In view of the foregoing, the study concludes that local institutions are not only significant in promoting community based local adaptation processes but if strengthened can act as linkages and mediators for external support outside of the communities.

### Recommendations

Based on the findings, the study recommends that there is urgent need to enhance local institutional capacities through greater engagements and partnerships between community institutions and external actors such as the government and civil society as this will promote knowledge development and resource sharing. In addition, interventionist programmes aimed at promoting rural livelihoods in the Niger Delta should be mediated through the local institutions as a means of strengthening their roles in promoting local adaptive capacity in the region.

### References

- Agrawal, A. (2010). Local institutions and adaptation to climate change. In Mearns, R. & Norton, A. (Eds.), *Social dimensions of climate change: Equity and vulnerability in the warming world* (pp. 173-198). Washington, DC: The World Bank.
- Agrawal, A., Kononen, M., & Perrin, N. (2009). The Role of Local Institutions in Adaptation to Climate Change. Social Development Working Papers. Social Dimensions of Climate Change. Paper no. 118/June 2009
- Bernier, Q., & Meinzen-Dick, R., (2014). *Building resilience for food, nutrition and security: Resilience and social capital*. International Food Policy Research Institute.
- Daivi, R. T. (2012). Social innovation and climate adaptation: Local collective action in diversifying Tanzania. *Applied Geography*, 33 (1), 128-134.
- Degefa, T. (2009). An assessment of the role of local institutions and social capital in household food security: A case study at two rural communities in Oromiya Zone, Amhara Region. In Svein, E., Harald, A., Birhanu, T., & Shiferaw, B., (eds.) *Proceedings of the 16th International Conference of Ethiopian Studies, Trondheim 2009* (pp.793-807).

- Di Gregorio, M., Hagedorn, K., Kiri, M., Korf, B., McCarthy, N., Meinzen-Dick, R., Swallow, B., Mwangi, E., &Markelova, H. (2012). Property rights and collective action for poverty reduction: A framework for analysis. InMwangi, E., Markelova, H., &Meinzen-Dick, R. (eds.), *Collective Action and Property Rights for Poverty Reduction: Insights from Africa and Asia* (pp. 25–48). Philadelphia, PA, US: Penn Press for International Food Policy Research Institute.
- Ejiba, I.V., Onya S.C., & Adams, O.K. (2016). Impact of oil pollution on livelihood: Evidence from the Niger Delta, Nigeria. *Journal of Scientific Research & Reports*,12(5), 1-12.
- Eregha, P.B, &Irughe, I.R., (2009). “Oil Induced Environmental Degradation in the Nigeria’s Niger Delta: The Multiplier Effects.” *Journal of Sustainable Development in Africa*, 11 (4), 160-175.
- Idodo-Umeh, G.,&Ogbeibu, A. E. (2010).Bioaccumulation of the heavy metals in cassava tubers and plantain fruits grown in soils impacted with petroleum and non- petroleum activities. *Research Journal of Environmental Sciences*, 4 (1), 33 – 41.
- Kadafa, A. (2012). Oil Exploration and Spillage in the Niger Delta.*Civil and Environmental Research*, 2 (3), 38-51.
- Kirori, G.N (2015). *Social capital as a strategy for promoting rural livelihoods: Case for Kenya*. Progressive Academic Publishing Birmingham, United Kingdom 2015.
- Ojimba, T.P., Akintola, J., Anyanwu, S., &Manilla H. (2014). An economic analysis of crude oil pollution effect on crop farms in rivers state. Nigeria.*Journal of Development and Agricultural Economics*, 6(7), 290-298.
- Tumbo, S. D., Mutabazi, K.D., Masuki, K.F.,Rwehumbiza, F. B.,Mahoo, H.F., Nindi, S.J., & Mowo, J.G. (2013). social capital and diffusion of water system innovations in the Makanya watershed, Tanzania.*TheJournal of Socio-Economics*,43, 24–36.