Analysis of Social Networks in Informal Solid Waste Collection and Recycling Enterprise in Makurdi and Lafia Township of North Central Nigeria.

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Abstract

Literature has shown that a main feature of the informal sector economic enterprise is the use of informal social network to drive enterprise. However, we do not know whether the networks used are the same in informal solid waste collection and recycling activities and how they influence informal solid waste recycling activities in Nigerian cities. The study analysed social network in informal solid waste collection and recycling enterprise in Makurdi and Lafia Township, North central Nigeria. Questionnaire and interview guide were used to collect data on social network variables and its influence on informal recycling enterprise. Cluster and purposive samplings were applied to select and administer questionnaire to 770 respondents waste pickers using the existing spatial structures from the towns while chairmen of the waste dealers associations were interviewed. Data collected was analysed using descriptive and analytical statistics, namely mean, standard deviation, chi square and phi coefficient. The study found that social networks that sustains the enterprise includes ties with house owners, ethnic affinities, partnership with private business institutions and the role played by waste dealers associations in giving security tips, providing financial assistance to members among others. The chi square analysis shows statistically significant relationship between social network and level of involvement in informal activities ($p= 0.000$, $p<0.05$).Phi coefficient analysis also shows positive relationship (Phi= .326). Policy implications of the network include their use as collateral for members for credit facilities for poverty alleviation and to engage the state for other capacity building programmes. The study recommended for policy measures that could foster partnership with the recycling workers and contribute to expand the enterprise for more livelihood opportunities and mutual benefits between government and the recycling workers.

1.0 Introduction

The influence of social networks to entrepreneur's economic outcomes has been acknowledged in literature. Social networks refer to informal relationships that are used as a resource to support and sustain various activities. Social networks allow participants to access resources through the connections or ties they develop and therefore contribute to success of activities. According to Granovetter (1973)and Burt (1992) social networks affects livelihood opportunities and outcomes as they connect individuals with other people both within and outside their environment through contact of friends and other acquaintances. Furthermore, Batjargal (2003) averred that social network provides entrepreneurs avenues for identification of opportunities and to mobilize resources for desired outcomes. This implies that just like financial capital is important in the production process; social network is a critical factor in economic endeavours including recycling enterprise.

In the context of informal solid waste collection and recycling, Lourenco-Lindell (2002) posited that social network in informal recycling activities helps the workers to relate with the residents and city authorities and allow them access to recyclables. This implies that social networks used by informal recycling workers is a resource that facilitate access to recyclables in the informal recycling chain. This promotes recycling activities and contributes to solid waste management. The study by Lindell (2002) further emphasised that in other circumstances networks stand in for members to access loans or obtain scholarship for members for studies. A study in Zimbabwe, by Zuwarimwe and Kirsten (2010) found that even rural non-farm entrepreneurs use their informal relationship or connection to gather information and access other resources needed to establish and expand enterprise. In Vancouver Canada, the *United We Can* (UWC) network ensures access to materials by improving relations with the public and other group of binners. Other scholars also argue that beyond success of activities, social networks contribute to the promotion of urban security and social cohesion. Social networks are thus viewed by many as the most effective ways of guaranteeing for welfare of members.

Literature has shown that the channels of social networks may be through personal relationship, religious relationship, co-workers, friends, faith based friendship, kinship or institutional links as well as through association membership. Just as people may need a spread of ties accessing help, securing employment, social networks of different types are reportedly being harnessed for urban socio-economic and environmental development. In view of the above, social networks are often regarded as the touchstone for the success of activities and generally reflects primordial feature of social life as relations and used for several purposes. Individuals, groups and organizations use social network. The linkage of social networks has therefore attracted research from heterogeneous perspectives including informal recycling as it has proved to be a powerful factor in explaining actor's relations success, irrespective of its nuances.

Despite the seeming contributions of social networks in economic endeavours including solid waste collection, Meagher (2005) argued that social network can sometimes operate as mechanism of conspiracy while the activities of members in informal waste collection and recycling could contribute to litter the environment. Collier (2002) opined that it is not good because the control of institutions like clubs or unions by the powerful can produce "Mafias". It can also act as a means of bribery and opportunism (Gambetta 1996). It is however generally acknowledged that social networks muster valuable resources in activities. In Nigeria few studies however exist about this phenomenon. Against this backdrop this study attempted to answer the following questions in the study area; what are the social networks that sustain the waste recycling activity in the study area?, how are they contributing to supporting the activity in the area?, what is the relationship between social network and informal solid waste collection and recycling activity in the area?. Furthermore because urban solid waste management is one of the intractable problems of urban governance, the study also attempted to investigate how these informal networks interface with existing formal authorities responsible for solid waste management. This study investigates social networks in informal solid waste recycling activities in Makurdi and Lafia in North central Nigeria.

2.0 Location of the Study Area

The study was carried out in Makurdi and Lafia cities of Benue and Nasarawa states, north central Nigeria. North central region is one of the six geo-political regions in Nigeria. It comprises of six states (see Figure 1), namely Benue, Kogi, Kwara, Nassarawa, Niger, and Plateau as well as the Federal capital territory (F.C.T).

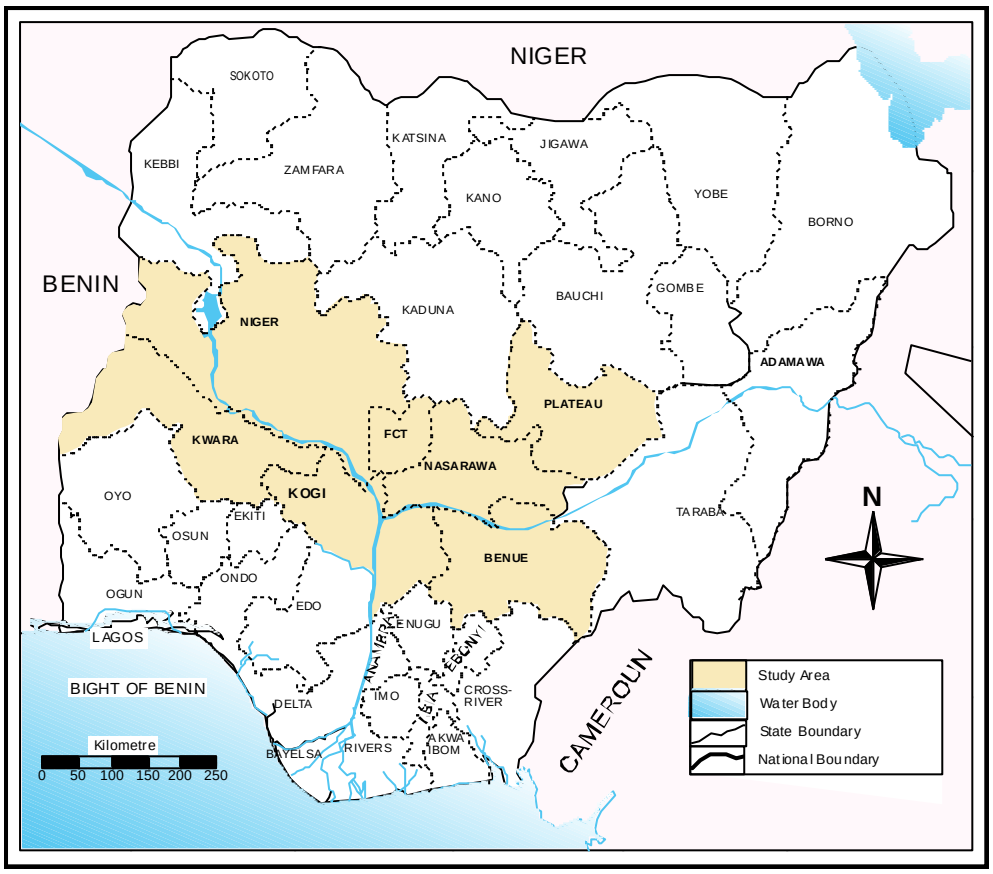

Figure 1: Map of Nigeria showing North central Region
Source: Bureau of Lands and Survey, Makurdi (2013)

2.1 Makurdi Township

Makurdi Township is situated between Latitude 7º 43'0''N – 7º51'3''N and Longitude 8º22'30''E -8º 39'0''E (see figure 2). It is bounded by Guma Local Government Area of Benue State to the North and North- East, North-West by Duma Local Government Area of Nasarawa state, South and South East by Gwer Local Government Area and south-west by Gwer-west Local government area of Benue. The town is situated astride river Benue about 300kilometers from Jos. It is located in the Middle-Belt area of Nigeria or what is called north Central Nigeria. The city is almost equidistant between Northern and Southern Nigeria and lies within the lower Benue basin. Historically it was founded in the early 20th Century as a fishing settlement known as Lobi and subsequently used as trading Port for buying and collection of agricultural produce by British Colonial authorities. It was developed as administrative centre of Benue province in 1927. Prior to this, Makurdi was part

of the protectorate of Northern Nigeria. The city has been the capital of Benue state since its creation because the original Benue was carved from Kwara and Benue Plateau on the 3rd of February, 1976.

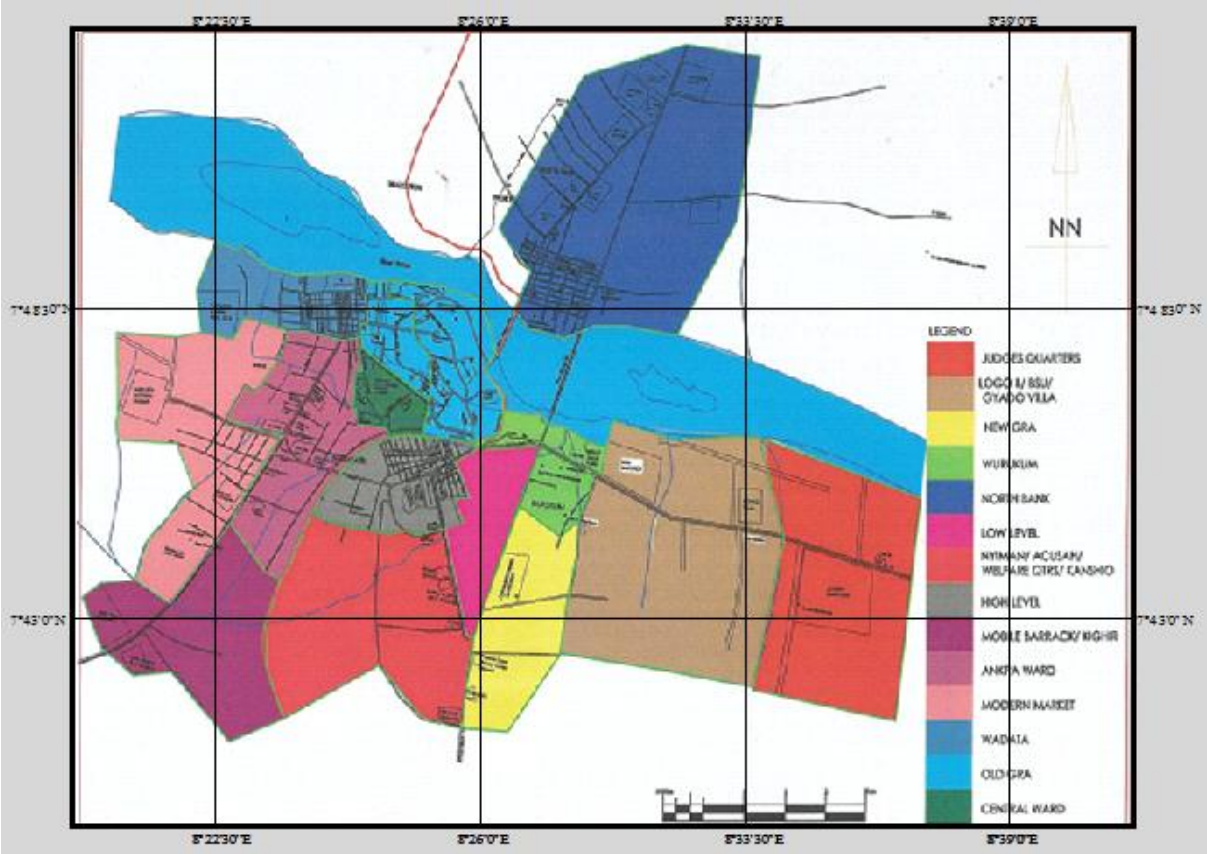

Figure 2: Makurdi Town Showing Built-up Areas
Source: Bureau of Lands and Survey,akurdi (2013)

2.2 Lafia Township

Lafia is located between latitude $7^0$30'N and $7^0$55'N and longitude $8^0$30'E and $8^0$50'E (see figure 3). It can be located in the north central region of Nigeria about 127kms south east of Abuja, Nigeria's capital city. It is along Kano-Keffi-Makurdi- Port-Harcourt highway. Lafia settlement was part of northern protectorate and became the capital of Nassarawa state in October 1996;

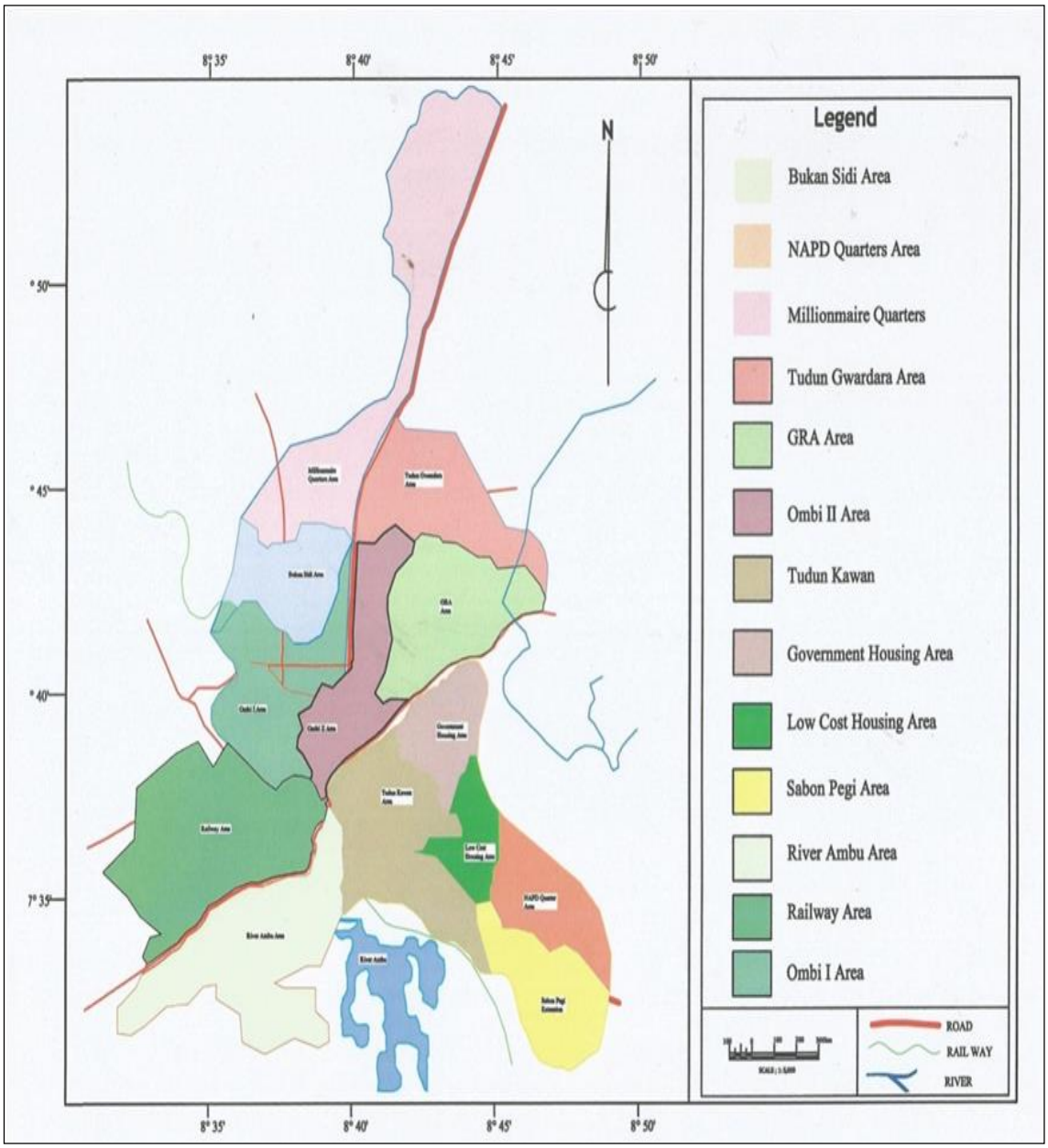

Figure 3: Map Showing Built-up Areas of Lafia Town
Source: *Nasarawa Urban Development Board, 2013*

3.0 Methodology

The study population was made up of itinerant waste pickers and waste dealers associations involved in the waste collection and recycling chain. The study employed cluster and purposive sampling techniques. Cluster sampling was used to stratify the study area into neighbourhood areas while purposive sampling was applied to choose the target respondents (see Table 1).

Table 1: Distribution of Questionnaires among Sampled Residential Neighbourhoods in Makurdi and Lafia Township.

S/No	Name of Neighbourhood	Total No. of Questionnaires Administered Per Neighborhood
1.	Wurukum, Makurdi	120
2.	Old Town, Lafia	120
3.	Wadata, Makurdi	100
4.	Sabon Pegi, Lafia	100
5.	North bank, Makurdi	90
6.	Bukan Sidi, Lafia	70
7.	High level, Makurdi	60
8.	Tudun Gwandara, Lafia	60
9.	Ankpa ward, Makurdi	50
	Total	**770**

Source: Researcher's survey and data, 2015.

Preliminary investigations by the researcher indicated that there exists informal solid waste recycling workers associations in Makurdi and Lafia cities with total registered membership of 1,100 persons; six hundred members from Makurdi and five hundred in Lafia. In view of the above, this total membership for the two cities was taken as the sample population for the study. In order to determine the sample size for each of the cities, 70% was used to represent the population of respondents in each city. In this way four hundred and twenty (420) respondents were purposively sampled among the built residential neighbourhoods for Makurdi while three hundred and fifty (350) were also purposively drawn from built residential neighbourhoods of Lafia. The respondents were purposively drawn across the activity areas which coincided within the major built up neighbourhoods which are characterised by high population densities. This gave a total sample size of seven hundred and seventy (770). Oduwaye and Farinmade (2013) sampled10% of the population of informal sector traders present on the streets in Lagos Island and obtained valid results.

Respondents were asked to rank their perception about the social networks that sustains informal recycling activities. Descriptive statistics of mean based on the sum response of respondents on the likert scale was used to determine the relative importance of the networks and their strength. For instance, based on the likert scale response the mean values were used to define the social networks that drives informal recycling activities. Excerpts of the interview administered to the chairman of waste dealers association for Makurdi and the one of Lafia on how the networks assist their members as well as key informants to agencies responsible for waste management in the area were analysed descriptively. The chi square test was used to test for significant relationship between social networks and level of involvement in informal solid waste recycling. The phi coefficient was further used to show the strength and direction of the relationship; that is whether perfect positive, strong positive, weak positive, weak negative, strong negative or perfect negative.

4.0 Research Results

Data was collected from respondent's perception about the kind of social networks that support the activity chain. A total of 20 support networks reported in literature were spelt out and investigated based on responses of the waste pickers to determine the catalogue of the networks considered key to aiding informal recycling activities. The findings are presented in Table 2.

Table 2: Distribution of the Perception of Respondents and Descriptive Statistics of Likert Scale Variables on Social Networks that Sustains Informal Solid Waste Recycling Activities in Makurdi and Lafia

Variable	Survey statement	N	Strongly Disagree (SDA)	Disagree (DA)	Neither Disagree Nor Agree (NDA)	Agree (A)	Strongly Agree (SA)	Sum	Mean (Descriptive Statistics)	Rank
Public partnership	Partnership with state institutions	770	0	112	203	452	3	2658	3.45	11
Private partnership	Partnership with private business institutions	770	2	17	129	619	3	2914	3.78	3
Personal ties	Personal ties with house owners	770	0.0	0.0	107	656	7	2980	3.87	1
Family ties	Partnership with family relations	770	0	43	107	617	3	2890	3.75	5
Faith ties	Partnership with religious institutions	770	9	154	207	391	9	2547	3.31	15
Guidelines	Role by guide lines/sanitations	770	10	117	611	27	5	2210	2.87	18
Slogans	Chanting slogans	770	12	252	217	259	30	2353	3.06	17
Association	Membership of recycling association	770	8	337	217	180	28	2193	2.85	19
Tax	Payment of tax/lobby of formal government institution	770	25	312	241	172	20	2160	2.81	20
Information	Sharing of information among colleagues	770	5	52	228	448	37	2585	3.4	14
Group relationship	Group participation/working relationships	770	9	33	135	583	10	2862	3.72	7
Affluence	Affluence of community where one works	770	16	56	308	379	11	2623	3.41	12
Location	Location of the work place	770	38	43	261	418	10	2629	3.41	12
Distance	Extent/distance covered per day by person	770	10	109	143	501	7	2696	3.5	10
Crew link	Link with collection crew	770	42	148	212	360	8	2454	3.19	16
Familiarity	Familiarity/regular contact on routes	770	10	16	129	601	14	2903	3.77	4
Communication	Local communication (language)	770	5	14	123	609	19	2933	3.81	2
Finance	Financial standing	770	31	17	237	468	17	2733	3.55	9
Experience	The role of experience/capital	770	2	8	215	523	22	2865	3.72	7
Rapport	Report with community trust	770	0	0	224	511	35	2891	3.75	5

Scale: strongly agree = 5; agree = 4; neither agree nor disagree = 3; disagree = 2; strongly disagree = 1.
Source: *Field Data Analysis (2015).*

Table 2 shows that most waste pickers agreed that personal ties with house owners played a critical role in facilitating their activities ($\bar{x}$ = 3.87). Similarly the respondents also agreed that partnership with private institutions helped to sustain their activities ($\bar{x}$ =3.78). They also agreed that family ties as well as working in group were among the ways that help to keep the activity ($\bar{x}$ = 3.75; $\bar{x}$ = 3.72). Furthermore the result also shows that other networks identified by the respondents include financial standing of respondents ($\bar{x}$ = 3.81) as well as partnership with state institutions. All these and others are indicative of the various types of networks that contributed to the success of the activity in the area as shown in Table 2.

Findings as obtained from the interaction with the respondents who were members of the waste associations acknowledged the role played by the *Scrap dealers or Yan Bola associations* in recycling activities. For instance raising money to carter for sick members, transport them home when they were sick and handle litigations all served as wellbeing measures and moral support, among others, for those involved in the enterprise. These findings were corroborated by the excerpts of the interview with from chairmen of the waste associations in Makurdi and Lafia (see Table 3). This is in tandem with postulations by Tremblay et al (2010) among other models on the role of social network in informal recycling.

4.1 Waste Recycling Associations and Recycling Waste Workers

An interview with the Chairmen of waste dealers association in Makurdi and Lafia revealed some of the various ways the associations ensure the welfare of their members and types of assistance they give to their members to ensure they remain in the enterprise as contained in Table 3.

Table 3: Waste Recycling Associations and Waste Collection and Management in Makurdi and Lafia

Respondent	Excerpts from Interview	Location
Chairman Makurdi Scrap Dealers Association, Makurdi	"We operate a share Bam for our members; we give them security tips on how they can go about their work without hindrance, handle police cases for them and also give them money to go home when they are sick". However, we also sanction erring members by sending them to the Police or Vigilante for prosecution or reformation or we can send you out of the business here".	Makurdi
Chairman Lafia Scrap Dealers Association – *Yan Bola*	"We give financial assistance to our members who may be out of money, represent our members even in court if we feel they are innocent and protest against unfair treatment by authorities to our members; we also ensure good working relationship among our members''.	Lafia

Source: *Author's Field Interview (2015)*

The excerpts of the interview result with the association chairmen as shown in Table 3 indicates that the associations helped to carter for the problems of their members. The members were utilizing their organization by pulling resources together and drawing upon them. Their activities were contributing to recycling of solid waste materials which otherwise could have gone into the municipal environment as filth. The associations had formal structures, gave security tips to her members and ensured discipline among members for peaceful working relationship among members. They contributed even to the revenue base of the states apart from picking and recycling but are not assisted by authorities as reported by the heads of the associations and corroborated by heads of the agencies responsible for solid waste management. They were accused of promoting litter in the environment by the agencies as reported during the interview with the authorities

The implication of all these is that the discovery of the enterprise comes through relations and is supported by several other networks which keeps the worker on to the enterprise. It is built and sustained by social connections in the study area just as in several other places of the world. Social networks as social resources are therefore playing an invaluable role for the success of recycling activities in the study area like in other economic enterprise. The networks are organized not only to connect or interact for greater supply of materials but also cater for the welfare of their members. The waste pickers relied on them not just for their activities but as a source of information and security. According to some junk dealers, the support network groups contributed to the sustenance of the activity in the area since through such networks they shared information on where to source for labour (waste pickers). They also portend a platform for social organization and exploitation for proper engagement by city authorities, non – government organizations, companies and manufacturers for urban socio-economic and environmental development as obtained in other cities of the world.

In all of these however, association leaders decried their non-inclusion in government welfare packages and other favourable assistance. In Lafia city, findings indicated that government had promised the waste pickers assistance several times since 1999 without fulfilment. A Director of Environment in the Ministry of Water Resources and Environment in Makurdi confirmed that the government does not assist the workers in any way. In Lafia however the authorities declared that they had tried to help mobilize them, register them, giving them guidelines and build their capacity.

4.2 Relationship between Social Network and the Recycling Enterprise

In order to determine the relationship between social networks and level of involvement in informal solid waste recycling activities, the study used the chi- square (X^2) test and the phi correlation test to determine the strength and direction of the relationship. Tables 4 and 5 present the results as follows:

Table 4: Chi-square Test

	Value	Df	Asymp. Sig. *(2-sided)*
Pearson chi-square	81.55[a]	2	.000
Likelihood Ratio	66.427	2	.000
Linear by linear Association	1.782	1	.182
N of valid cases	770		

X^2=81.855, df =2 and p=0.000
Source: Field data analysis (2015)

Table 5: Phi Coefficient test

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal Phi	.326	.000
Cramer'V	.322	.000
N of Valid Cases	770	

Source: Field data analysis (2015)

The analysis of result of the chi-square test contained in Table 4 shows that the pearson chi-square value is 81.55, df =2 while the p-value is .000. Using the alpha value of 0.05 it can be deduced that there is a statistically significant relationship between social networks and level of involvement in informal solid waste recycling activities in Makurdi and Lafia cities since p< 0.05. The result of the chi-square analysis is in agreement with the model postulated by Wasserman and Faust (1994) that informal relationship or interactions in the form of ties facilitate the flow of resources in critical activities including informal recycling activities. To further show the direction and strength of the relationship, the phi coefficient test in Table 5 shows nominal by nominal phi value of .326. This shows that social networks have positive link or connection with status of informal recycling activities. This is in tandem with submissions by Baum and Ziersch (2003) in Australia.

Conclusion and Policy Implications

The study explored the kind of social relations sustaining and pervading the activity. Arising from the empirical findings presented, it can be deduced that social networks or relations has been established as a main feature of informal economic enterprise. Generally, the study revealed that the role played by social network in informal recycling is a manifestation of the wider contributions to informalization which is generally viewed by contemporary scholars as a feature of modern economic enterprise that has a nexus with the formal institutions. For instance

the networks hold implication for planning urban economic activities as well as development projects. They can be harnessed as fibres of urban cohesion, and for security challenges in our cities. The already existing associations of waste workers (*Scrap Dealers Association and Yan Bola*) are already playing the role of an arbiter and present a potential platform for harnessing and negotiating partnership or agreement and for capacity building for effective service delivery in solid waste management, and other public engagement. The networks have potentials for social organization, political administration and urban development challenges in the study area

In many countries, organised social networks provide collateral for members to access credit facilities and are used to engage the state in service provisions. In order to capture all enterprise groups therefore government in Nigeria could understudy, organize and capture the enterprise groups so that they can serve as formal bureaucratic channels for microenterprise development programmes. Similarly, government enlightment programmes can use these known networks as important resource.

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