



Innovative Financing and Local Development in Ghana

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How to cite this paper: Agbenyefia, S. (2022) Innovative Financing and Local Development in Ghana. *Open Access Library Journal*, 9: e9013.

<https://doi.org/10.4236/oalib.1109013>

Received: June 17, 2022

Accepted: August 13, 2022

Published: August 16, 2022

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Abstract

Development is a continuous process that requires new and additional ideas for financing systems. For this reason, the search for development finance in local and national development is necessary. This study seeks to investigate innovative financing to produce knowledge resource for improving local development in Greater Accra and Greater Kumasi Metropolitan Areas of Ghana. Panel data for ten years (2011-2020) were collected for the two Assemblies from Composite Budgets, Annual Reports, and others on Public-Private Partnership and Waste Management depositories through interviews and internet search. Data were processed using Microsoft Word and Excel 2013 and STATA SE 14 Versions. Data analysis techniques employed were narrative, standard deviation, correlation co-efficient and regression. The findings and analyses of results are that the coefficient of variation of uncompleted projects for AMA and KMA is 37%. Hausman test is not significant since fixed effect model of panel data is the same as random effect model, both can perfectly model the pattern in the data and established statistical validation of the study. A unit increase in innovative financing would result in 47.7 percent increase in Assembly development. By implication innovative finance has a statistically significant positive effect on local development. Furthermore, an improved financing system recommended for MMDAs is waste to wealth conversion through revenue generation, jobs creation and clean environment on sustainable basis. Waste as seen as a threat to society would now become an opportunity. Additionally, the use of appropriate technology in local development is necessary.

Subject Areas

Economics

Keywords

Innovative Financing, Local Development, Waste-to-Wealth, Executed and

Unexecute Projects

1. Introduction

Innovative financing (IF) contributes immensely towards development finance and is identified as the surest way of achieving the needed development for contemporary societies and has come to stay. Innovative financing has been practiced at the global and national levels but less of it at the local levels hence the need to search for this knowledge resource to promote local development in Metropolitan, Municipal and District Assemblies (MMDAs) of Ghana. Since development at the grassroots leads to national development in its entirety, it must be a concern to all stakeholders.

Development finance involves existing (traditional) and innovative financing mechanisms. The existing financing mechanisms are those models under the Old Economic Order such as direct short-term borrowings for long-term development; grants without resource delivery; loans with stringent conditions and high costs; central governments as the only sources of funding development; microcredits with no repayment plan for growth; donor funding without proper performance measurement and many others. All the above sources mentioned for funding development were either exhaustive or inadequate to achieve their objectives leaving huge development deficits, especially in developing countries.

Innovative financing is adaptable to changing events in time and space. In other words, it is flexible and sustainable. The World Bank defines innovative financing for development as “those that depart from traditional approaches to mobilizing development finance—that is, through budget outlays from established sovereign donors or bonds issued by multilateral and national development banks exclusively to achieve funding objectives. Innovative development finance therefore involves non-traditional applications of solidarity, PPP, and catalytic mechanisms that: 1) support fundraising by tapping new sources and engaging investors beyond the financial dimension of transactions, as partners and stakeholders in development; or 2) deliver financial solutions to development problems on the ground” (United Nations Development Programme, 2012) [1]. Examples of innovative financing (IF) include public-private partnership (PPP), syndicated loans, diaspora and local bonds, microfinance products, emerging donors, build-operate-transfer (BOT), socially responsible investments, sanitation fine fees, solidarity taxes, carbon finance, airline ticket tax, water levy, waste to wealth conversion, women’s livelihood bond, among others.

The operational definition for local development in the study referred to the local activities in the two local state institutions Accra Metropolitan Assembly (AMA) and Kumasi Metropolitan Assembly (KMA). The local development is classified into two, the numeric (economic growth) and non-numeric (human-centered). The indices of quantitative development include production, distribu-

tion and consumption of goods and services. Other activities include provision of infrastructure such as roads, dams, energy, machines and equipment, schools, hospitals, housing, market places, automobiles, good drinking water, sanitation facilities, information technology and communication facilities, aero-system and many others. The non-numeric development which was introduced in the later part of the 20st century saw a lot of issues concerning health care needs, education for all, gender equality, social welfare benefits, child mortality, maternal mortality, physically challenge persons, press freedom, state of happiness, clean and safe environment, democracy and needs of vulnerable groups among others that are to be provided in a sustainable manner.

Ghana has local governments as agents of development at the grassroots level but are in development deficits as a result of inadequate funding. The Local Government Law, 1988 (PNDCL 207) was enacted to give legal backing to the new local government system. The 1992 Constitution of Ghana made decentralization mandatory and provided that Ghana put in place "... a system of local government and administration which shall, as far as practicable, be decentralized" (Section 240 (1) of the 1992 Constitution) *Rudith et al.* (2003) [2]. Currently, Ghana has a total of 260 Metropolitan, Municipal and District Assemblies (MMDAs). The sources of finance to MMDAs include Central Government Special Allocations, Internal Generated Funds (IGFs), District Assemblies Common Fund (DACF) and Donor Funding. Yet these sources cannot generate enough funding for development.

In Ghana, resource delivery policy backed by government instrument saw the use of innovative financing like National Health Insurance Levy (NHIL), Get Fund Levy, "Borla Tax", Covid-19 Levy, E-Levy etc. as interventions to development. These deliberate interventions at national level are absent at the grass-root level. Innovative financing as knowledge resource in pursuing local development is a gap among the MMDAs. IF generates revenue for development and is being driven by collaborations among investors and technology. It is either an improvement of the existing financing models or complete set of new ideals. The general aim of the study is to analyse innovative financing for improving local development in Greater Accra and Greater Kumasi Metropolitan Areas.

The outline of work includes, Title, Authors and affiliations, Abstract, Introduction, Research Hypotheses, Theory/Methods, Results, Discussion, Conclusions, Recommendation, Acknowledgements, Conflict of Interest and References

2. Research Hypotheses

- 1) The existing financing is not adequate for funding local development.
- 2) Innovative financing increases local development.

3. Related Works

This section has reviewed concepts, empirical studies, conceptual framework and theoretical underpinning of innovative financing and local development.

3.1. Innovative Financing

Innovative financing systems are new or additional ways of funding development aside the traditional sources. The concept was introduced as a result of the insufficient manner the traditional sources or existing financing systems of raising funds to execute developments is worrying. According to Financial Times, Financial Innovation can be defined as the act of creating and then popularising new financial instruments as well as new financial technologies, institutions and markets. It includes institutional, product and process innovation (Financial Times, 2019) [3].

World Bank Group defines Innovative Finance as any financing approach that helps to:

- Generate **additional** development funds by tapping new funding sources (that is, by looking beyond conventional mechanisms such as budget outlays from established donors and bonds from traditional international financial institutions) or by engaging new partners (such as emerging donors and actors in the private sector).
- Enhance the **efficiency** of financial flows, by reducing delivery time and/or costs, especially for emergency needs and in crisis situations.
- Make financial flows more **results-oriented**, by explicitly linking funding flows to measurable performance on the ground (The World Bank Group, 2009) [4]. The concept of innovative financing systems came at the later part of 20th century as vehicles to achieve Millennium Development Goals. As evolving concept, it is limited in scope in terms of literature review but useful in today's development finance.

3.1.1. Type of Innovative Financing

The concept of public-private partnership (PPP) envelops most innovative financing that takes different forms. For instance, Build-Operate-Transfer (BOT), socially responsible investments, waste to wealth conversion, airline ticket tax, water levy and others are operated through the philosophy of PPP. It is a convenience way of working in the huge private capital funds that are idle into local development for mutual benefits to accelerate growth at same time create jobs for that matter reduce poverty. Infrastructure is defined as transportation infrastructure (roads, bridges, airports, ports, rail lines); communications infrastructure; housing; and electricity generation and distribution. Infrastructure projects can be "mega projects" (dams, coast-to-coast highways, mega-ports, large power plants) or much smaller projects that can include communication franchises or limited highway spurs (Alshawi, 2009) [5].

3.1.2. The Concept of Local Development

The concept of local development is defined as a particular form of regional development, one in which endogenous factors occupy a central position. A stages model of local development is proposed: 1) the emergence of local entrepreneurship; 2) the "take off" of local enterprises; 3) the expansion of these enter-

prises beyond the local region; and 4) the achievement of a regional economic structure that is based upon local initiatives and locally created comparative advantages. The theoretical and empirical foundations of this model are examined, with particular emphasis upon the roles of the entrepreneur and of human capital in the process of economic growth, and upon the spatial effects of the expansion of the firm (Polèse, Coffey, & Mario, 1984) [6].

3.1.3. The Structure of Local Development

According to Alicja Sekuła (2014) [7] local development is finding an answer to the question: what do the terms *local*, *local scale*, *local community* and *local government* mean? Locality, often treated as a distinguishing feature, regards a relatively small area. Despite the fact that the term “local” is often understood as “limited to a given area”, the term relates not only to a specific space. A local arrangement, delimited by parameters of administrative division, should take into account also the sum of such features as: the history of the area, specific social and economic features, cultural features and even geographical features.

Alicja Sekuła’s definition of local development is in two folds; the local community and its needs and changes taking place within the local arrangement. By so doing, his focus was on the process of establishing local development. Local authorities’ institutions, organisations and individuals engage in this process in order to use local resources and opportunities and perform activities in various domains with benefit to the people forming the local community. The second part concentrates on the effects of changes taking place as a result of development on the local scale. The two classes listed above should not be treated as mutually exclusive, but rather complementary.

3.1.4. Empirical Review

Innovative financing systems are being practiced across the globe as means of development finance. United Nations, under WHO programmes in partnership with some private investors like Bill Gates, The Rockefeller Foundation others provide vaccines for diseases control that include HIV/AIDS, Tuberculosis and Malaria. Advance Market Commitments. The International Finance Facility for Immunisation (IFFIm) is a unique public-private partnership that brings together donor governments and the international capital markets to vastly accelerate the availability of funds for GAVI immunisation programmes (WHO, 2010) [8].

At the regional and national levels, IF through PPP provide a lot infrastructural development that could not have been achieved without this concept. Some of the examples are Indian Railway, Port Klang Container Terminal in Malaysia, Siam Reap Airport in Cambodia, Tema Harbour Container Terminal and Tema Motorway Roundabout Projects in Ghana and many others. It is a conduit through which private capital is been lured into public investments.

In Ghana, waste collection and disposal has been managed in partnership with private investors, especially Zoom Lion Company over the years. The Sanitation

Challenge for Ghana (SG4Gh) initiative, which is being implemented as an innovative financing arrangement to improve urban liquid waste management in the Metropolitan, Municipal and District Assemblies (MMDAs) seeks to encourage and promote these ideals. This was the entry point of the SC4Gh prize update that was shared and well received by stakeholders at the side event of the fifth annual national basic sanitation stock taking forum (STF) in Kumasi (National Basic Sanitation Stocktaking Forum, 2017) [9].

3.2. Relationship between Innovative Financing and Local Development

The a priori expectation is that Innovative Financing increases local development. An a priori expectation is research estimated result or basic principle or fact assumed for a study out of experience, observations or studies. It relates variables of a study to establish a relationship. It is the basis on which conceptual framework of a research is developed

In **Figure 1**, at the **Local State Institutions (MMDAs) Level**: Sanitation Fees, Pollution Levy, Waste-to-Wealth Creation Syndicated Loans arrangement, Municipal Bonds, and Joint Venture among MMDAs, Build, Operate and Transfer (BOT), Renewed Sanitation Fines, Special Plastic Levy, Special Levy on Abandoned Properties, Excessive Noise Making and Pollution among others. The outcomes of local development in AMA and KMA areas are as follows: construction of roads, provision of schools, health, markets, lorry parks, community centres, ITC centres, health insurance scheme, welfare benefits, scholarships, community policing, good drinking water, improved sanitation and patient-health-officer ratio among others.

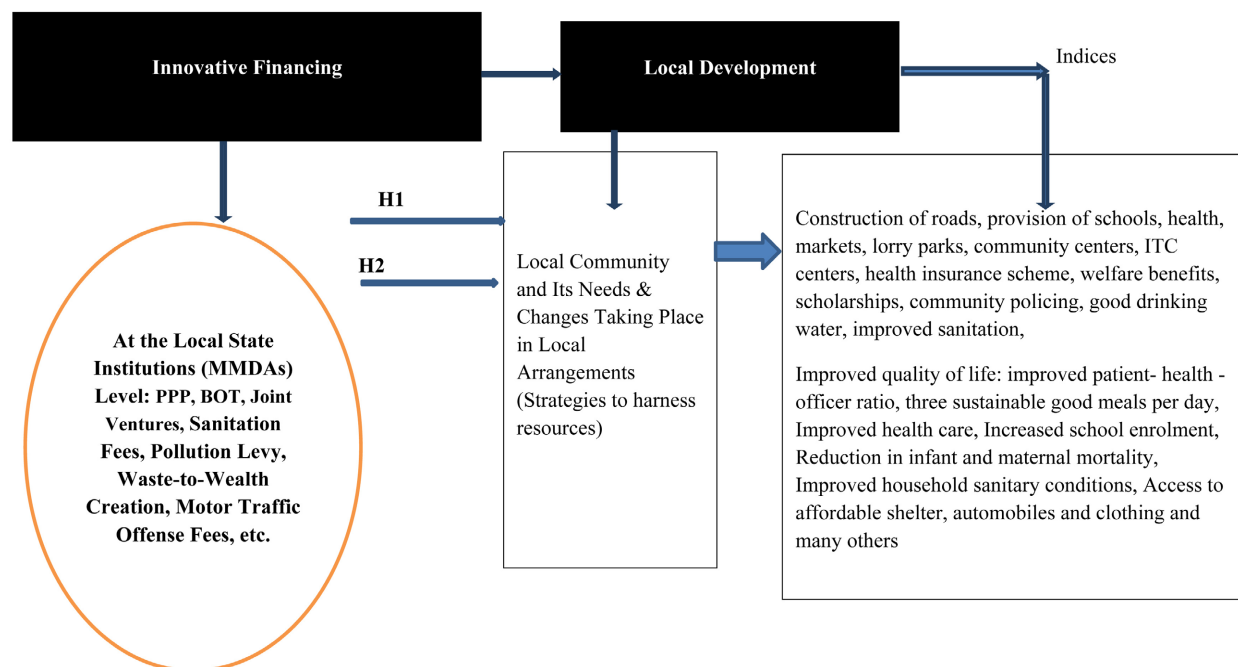


Figure 1. Conceptual framework for innovative financing and local development. Source: Author's construct, 2022.

Lessons from the review show that most of the innovative financing models are being practiced at the global and national levels. Only few of these models as suggested in the conceptual framework and more are practiced in the MMDAs in Ghana to promote local development. The scarce knowledge to generate additional funding for local economies remains mythical.

4. Methodology

The study used quasi-experimental approach but more of archival data. The Officers of the Assemblies were interviewed and also accessed their web data to obtain information. Penal data were gathered and summarised from Composite Budgets, Annual Reports and Public-Private Partnership Records for ten years (2011-2020) of the Assemblies' depositories. As though, the study by information is mixed, it is more of quantitative research. Karl Pearson's mathematical coefficient of variation was used to analyze unexecuted projects and Hausman Test was to predict innovation financing for local development.

5. Results of Existing Finance and Local Development

In determining the Coefficient of variation for uncompleted projects, the dominant variables are planned development (budgeted) and uncompleted projects. X is the expression of uncompleted projects over planned development (budgeted) in decimal or percentage term (**Table 1**).

Table 1. Coefficient of variation for uncompleted projects of AMA and KMA during the period (2011-2020).

Year	Planned Development	Uncompleted	(x)	$X - \bar{X}$	$\Sigma(X - \bar{X})^2$
2011	58930677.41	11763275.18	0.20	(0.18)	0.0313
2012	72775416.57	24685394.72	0.34	(0.04)	0.0014
2013	103870480.54	61297542.27	0.59	0.21	0.0457
2014	97969841.47	19210520.71	0.20	(0.18)	0.0325
2015	99100880.24	38670214.07	0.39	0.01	0.0002
2016	186186008.54	91417432.53	0.49	0.11	0.0131
2017	216871595.89	107050988.74	0.49	0.12	0.0137
2018	208316467.00	83269340.43	0.40	0.02	0.0005
2019	130612619.73	34331472.71	0.26	(0.11)	0.0129
2020	140945659.14	56684737.51	0.40	0.03	0.0007
	1315579646.5	528380918.87	3.76		0.15
N = 10		Mean (\bar{X}) = 1.76/10	0.38		$\Sigma(X - \bar{X})^2/10 - 1$
				\bar{O}^2	0.02
				SD	0.14
		Coefficient of Variation	SD/\bar{X}=		0.37

That is, X is the **proportion** of uncompleted project.

\bar{X} is the **mean** of uncompleted projects for the ten years.

$X - \bar{X}$ is the **variation** of the uncompleted projects from the mean for the various years.

$\hat{\sigma}^2 = \frac{\sum (X - \bar{X})^2}{N - 1}$ is the sum of the variances.

SD is the standard deviation.

N is the sample size (10 years), but in this case $N = 10 - 1$; because 10 is less than 25 in statistical analysis.

Coefficient of Variation is the expression of SD over the mean x , SD/x . It measures the ratio of standard deviation to the mean because standard deviation of data is best explained in the context of mean of the data.

Interpretation of Results

The means (x) of uncompleted projects for AMA and KMA is 0.38 or 38%.

The variance ($\hat{\sigma}^2$) of uncompleted projects is 0.02 and standard deviations (**SD**) is 0.14. The Coefficient of variation for uncompleted projects is 37% with the mean of 38%, which means uncompleted projects of the Assemblies deviated from the planned development with 37% (positive) for the ten-year (2011-2020) period as well.

6. Discussion of Result

6.1. Effect of Innovative Financing on Local Development

As the Assemblies realised that the existing financing models could not meet their development deficits, they introduced Public-Private Partnership (PPP) like Build, Operate and Transfer (BOT), Joint Venture, and others to attract private capital investments to local development. Public Private Partnership Act, 2020 (Act, 1039). AN ACT to provide for the development, implementation and regulation of public private partnership arrangements between contracting authorities and private parties for the provision of infrastructure and services, to establish institutional arrangements for the regulation of public private partnerships, and to provide for related matters (Parliament of Ghana, 2020) [10]. This Act mandates MMDAs to engage private contributions in local development but before the inception of the Act, the Assemblies were practicing innovative financing by type and not by instrument. The former made it difficult to practice until the passing and effective implementation of the Law in December, 2020. This means that the instrument can influence development finance of MMDAs through innovative financing-PPP. This establishes the relationship between innovative financing and local development with the hypotheses H1 and H2 in the conceptual framework.

Fixed-Effects (FE) is used whenever a researcher is only interested in analyzing the impact of variables that vary over time. FE explores the relationship between predictor and outcome variables within an entity (country, person, company, etc). Each entity has its own individual characteristics that may or may not

influence the predictor variables. Adding time effects to the entity effects model to have a *time and entity fixed effects regression model*:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \dots + \beta_k X_{k,it} + \gamma_2 E_2 + \dots + \gamma_n E_n + \delta_2 T_2 + \dots + \delta_t T_t + u_{it} \quad (3)$$

where

- Y_{it} is the dependent variable (DV) where i = entity and t = time;
- $X_{k,it}$ represents independent variables (IV);
- β_k is the coefficient for the IVs;
- u_{it} is the error term;
- E_n is the entity n . Since they are binary (dummies) you have $n-1$ entities included in the model;
- γ_2 is the coefficient for the binary regressors (entities);
- T_t is time as binary variable (dummy), so we have $t-1$ time periods;
- δ_t is the coefficient for the binary time regressors.

Control for time effects whenever unexpected variation or special events may affect the outcome variable (Torres-Reyna, 2017) [11].

Planned Development for the Assemblies-Local Development (**Dependent Variable**).

Independent Variables are Innovative finance, Executed Projects, Unexecuted projects, Assemblies' contributions and Partners' contributions

Controlled Variables: Water and sanitation, Trained staff, Population and Waste Bins supply, Boreholes, Student scholarship, Women group and Souvenirs.

6.2. Research Hypotheses

The study used relational approach to explain the hypotheses.

H1: Innovative financing by Government Policy Instrument increases local development.

H0: Innovative financing by Government Policy Instrument does not increase local development.

H2: Innovative financing by type increases local development.

Ha: Innovative financing by type does not increase local development

The empirical results from Hausman's predictor variables in a regression model presented in **Table 2**, revealed statistically significant positive relationship between Innovative Financing and local development.

Table 2 shows that there is no significant difference in errors between fixed effect and random effect models which means both can perfectly model the pattern in the data so Hausman Test is insignificant or the model seems to be unidentifiable. The result has it that a unit of innovative finance increases MMDAs' development by 47.7%; an increase in executed project would increase District development by 28.8% and a unit of unexecuted project decreases District development by 23.4%. An increase in population would decrease District development by 2.5%; water provision increases District development by 4.1%. A tree

Table 2. Results of effect innovative finance on district development.

VARIABLES	(1)	(2)
	Fixed	Random
	Coefficient	Coefficient
Innovative	0.477*** (0.000)	0.477*** (0.000)
Executed	0.288*** (0.000)	0.288*** (0.000)
Unexecuted	-0.234*** (0.000)	-0.234*** (0.000)
Population	-0.025*** (0.000)	-0.025*** (0.000)
Water	0.041*** (0.000)	0.041*** (0.000)
Trees	0.003*** (0.000)	0.062*** (0.000)
Waste bins	0.006*** (0.000)	0.006*** (0.000)
Souvenirs	0.180*** (0.000)	0.179*** (0.000)
Borehole	0.021*** (0.000)	0.024*** (0.000)
Student	0.005*** (0.000)	0.005*** (0.000)
Staff	0.002*** (0.000)	0.002*** (0.000)
Women group		0.001*** (0.000)
Constant	38.110*** (0.000)	38.380*** (0.000)
Observations	20	20
R-squared	1.000	
Number of id	2	2

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Source: Author's Construct, 2022.

planted would increase District development by 6.2% (random effect); provision of a waste bin increases District development by 0.6%; a souvenir provided would increase District development by 18% (fixed effect) and provision of a borehole increases District development by 2.4% (random effect). A student sponsored increases District development by 0.5%; a staff trained would increase District development by 0.2% and a women group helped increases District development by 0.1% (random effect).

In conclusion, an increase in innovative finance increases local development by 47.7 percent; result that H1 and H2 accepted for MMDAs. The result validates the a priori expectation and confirmed the position of other studies:

Increased funding for tuberculosis and substantial funds now flowing to tackle the HIV pandemic show serious attention is focused on health. Many African governments have progressed on their 2001 commitment to raise health spending to 15% of their national budgets. On the macroeconomic front, a growing consensus has emerged internationally that the challenges of increasing social-sector budgets at the country level are real but manageable. Greater predictability in donor finance is widely agreed to be key to the solution (Julian & Af-folder, 2006) [12].

In Costa Rica, a program of Payment of Environmental Services (PES) includes monetary compensation by Costa Rican society to private landowners either for maintenance of primary forest, establishment of forestry plantations, or forest management (Reyes at al., 2002) (as cited in World Summit on Sustainable Development Conference, 2002) [13]. The National Forestry Finance Fund FONAFIFO takes care of these area-based payments. FONAFIFO counts with funds provided by the national government, amongst others from taxes on fossil fuel consumption. From 1997 to end of 2000, the PES program included more than 250,000 hectares of private landowners (4.9% of Costa Rican territory). Of this land, 85% corresponds to forest protection, 9% to forest management systems and 6% to plantations (World Summit on Sustainable Development Conference, 2002) [13].

6.3. Synthesizing Waste-to-Wealth Creation for Local Development

This section of the work is to synthesize improved financing systems for local development and waste to wealth conversion model is highly considered to provide solutions. One of the biggest challenges facing MMDAs over the years is waste management, and that waste has engulfed all parts and corners of our cities, towns and villages. The water bodies are also choked with waste threatening our survival as human beings as well as animals. Metro TV Documentary Report in conjunction with Parliamentary Select Committee on Sanitation in Ghana, broadcasted in the evening of 8th February 2020 reveals that 2.8 million tons of waste is generated annually in Ghana.

AMA and KMA generate about 3600 and 1550 tons of waste daily respectively. However, this waste has potentials of being transformed into wealth. Nationally,

the waste and recycling industry in New York City generates more than \$93 billion in gross revenue annually (Associated Press, 2018) [14]. The waste stocks in every MMDAs have economic value that could generate revenue, jobs and clean environment on a sustainable basis. **Figure 2** and **Figure 3** are some landfill sites in AMA and KMA areas.

According to Ebenezer Owusu-Sekyere *et al.* (2013) [15] data collected on Municipal Solid Waste in 2013 in Kumasi Metropolitan Areas is as follows:

Table 3 presents the composition of waste in KMA which might vary in other areas of the MMDAs due to the nature of economic activities.

7. Summary

The study focuses on the concepts of innovative financing and local development, and established a positive relationship between them. It also confirmed that existing financing models alone cannot support local development.



Figure 2. Waste stock of Kumasi metropolitan areas. Source: Photograph of KMA landfill site.



Figure 3. Waste stock of Accra metropolitan areas. Source: Photograph of Kpone landfill site.

Table 3. Municipal solid waste in Kumasi metropolitan areas in 2013.

Waste Type	Composition Volume (KG)/per day	Percentage (%)
Organic	1235	20.00%
Plastic	1225	19.85%
Paper	967	15.67%
Glass	562	9.10%
Metal	481	7.80%
Textiles	403	6.54%
Wood	499	8.09%
Miscellaneous	799	12.95%
Total	6171	100%

Source: Modified from An analysis of plastic waste collection and wealth linkages in Ghana.

8. Conclusions

- The fact that the coefficient of variation for uncompleted projects for the MMDAs is 37% validates the hypothesis H1 that existing financing is not adequate for local development.
- The effect of innovative financing on local development shows that a unit increase in innovative financing would lead to 47.7 percent increase in local development.

9. Recommendations

Synthesizing improved financing systems for MMDAs, waste as seen as threat to society would now become an opportunity. Ghana has in stock abundant human excreta and waste in general that can be processed into fertilizer both organic and pellets for farming and also to recover the degraded green zones through the activities of illegal mining “galamsey” and lumbering. This input source is sustainable for fertilizer production as an agrarian economy on commercial scale and can even be exported to neighbouring countries. In addition, biogas is generated from waste as a cheaper source of energy and is environmentally friendly which can be used to fuel local industries and for domestic use as well. The Assemblies should encourage waste segregation at source of collection. This will reduce processing costs and turnaround time of production. This should be done through the use of by-laws and appropriate technology. The MMDAs can also explore other forms of innovative finance systems to close development deficit gap.

10. Limitations of the Study

The inability to access accurate data from the Assemblies is due to personal dispositions of some of the Officers, limit on data to public consumption and the

baseline selected. Secondly, the sample size representing the whole MMDAs may not reflect the true phenomenon on the ground even though it was purposive as the oldest and biggest District Assemblies.

Acknowledgements

I acknowledge the moral support from my PhD Thesis Supervisor, Prof Samuel K. Annim and Co-supervisor, Prof John Micah for their immersed contributions to my writings and publishing. I also thank my entire Agbenyefia family, especially my father Timothy Agbenyefia.

Conflicts of Interest

I hereby declare that this work is the result of my original research and that no part of it has been presented elsewhere.

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